LEGEND:

• = filled black dot (like scalar product) in original text
Ø = Greek letter **Ø** for the Scalar Electrostatic Potential field
∇ = Greek letter Nabla (upside down triangle)
|x| = Absolute value of x (only positive)
uf = microFarad

PRACTICAL OVERUNITY ELECTRICAL DEVICES

(C) T.E. Bearden
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Introduction

Recently, my associates and I have filed a patent application on what we believe will at long last reveal the mechanisms for practical overunity electrical devices. It is my purpose in this paper to provide additional information augmenting my former two papers, (1) "The Final Secret of Free Energy," Feb. 1993, and (2) "Additional Information on the Final Secret of Free Energy," Feb. 1994. In this present paper, with the permission of my colleagues, I release the gist of our work on separation of electrical charge into two coupled components **Ø**•(m), where **Ø**• represents the massless charge of the charged particle or mass, • represents the fact that it is coupled or trying to couple to the special mass that makes up charged particles [i.e., the special kind of mass that will couple to the virtual photon flux density that is represented by the symbol **Ø**], and m represents the inert mass component of the charged mass. Since not all masses will couple with **Ø**•, we indicate the type of mass that <u>will</u> couple with it, as •m. Thus a charged mass is composed of (**Ø**•)•(•m), which we consolidate to (**Ø**)•(m).

Charge Is Not Quantized

An interesting immediate result is that the massless charge of a fundamental charged particle is not quantized; it changes as a function of the background potential in which it is embedded. So it is discretized as a function of the background potential (i.e., of the virtual photon flux exchange between it and the surrounding vacuum). Otherwise, e.g., there could be no ∇**Ø** created on any charged particle q, and hence no E-field, and hence electrons would not move in our present circuits. Since they do move in our circuits, charge is not quantized.

Electrical Current Has Two Components

The first key to understanding free energy electrical and magnetic machines is to realize that electrical current actually consists of two currents coupled together. Our treatment of an electric charge as a coupled system (**Ø**)•(m) also means that electron current i = dq/dt is comprised of two coupled components [(d**Ø**/dt)•(dm/dt)]. This follows from simply invoking the operator d/dt; i.e., d/dt[(**Ø**)•(m)] = (d**Ø**/dt)•(dm/dt), which is the same as [(d**Ø**/dt•)•(•dm/dt)]. The component (d**Ø**/dt)• is the known but not well understood <u>massless displacement current</u>, while the component •(dm/dt) is the <u>mass displacement current</u>, and the coupling operator • means "coupled to" or "trying to couple to". The coupling operator represents a real physical operation: the exchange of virtual photons between the vacuum potential and the charged mass. Any potential $\text{Ø}_1\bullet$ is considered to be a potential that is superposed upon the ambient vacuum potential $\text{Ø}_0\bullet$, to provide a potential $(\text{Ø}_0+\text{Ø}_1)\bullet$. The ambient vacuum potential does not disappear merely because we add another potential to it!

Confusion In Present Electrical Physics

We point out that, in physics books of note, the overt coupling effect is essentially unknown or ignored because physics presently has not defined either the scalar potential or the electrical charge. The conventional theory simply uses an "inert" expression d**Ø**/dt to represent the displacement current (and another inert expression q for a charged mass), and most theoreticians are uncomfortable even with that. The displacement current is also confused with force by equating the displacement current d**Ø**/dt to dE/dt. In turn, this means that d**Ø**/dt is confused with mass, hence with dm/dt, which latter is also a component of dq/dt. m is always an \internal component\ of force, as is known in foundations of physics but this fact continues to remain completely oblivious to the electricians. [*Good* electrical theorists do admit that there is no force in the vacuum; and that the force associated with the E-field is evidenced only in the interacting mass. However, they continue to maintain the E-field (force per point-coulomb of charged mass) in the vacuum, when there are no point-coulombs of charged mass there!

Mass Is an Internal Component of Force

It is easy to show that mass is always a component of force: We will simply define *force* precisely. We first insist that no equation can be used as a definition; an equation simply states that the magnitude of one of its sides and the magnitude of the other side are equal. (The length of a board and the length of a human may be equal, but writing that as an equation has absolutely nothing to do with the definition of either a board or a human). So we will insist that any true definition must be an *identity*.

We define force F as $F \equiv d/dt(mv)$, whereupon mass is a component of force *a priori*. It follows that, if we define the E-field E as the force per coulomb, we are defining it as the force existing at a point and having a point-coulomb of charged mass as one of its major components. We may accurately now define E as $E \equiv -[(\nabla \text{Ø})\bullet(q)]/|q|$, where the absolute value symbol in the denominator is essential, q/|q| being one point-coulomb. [We leave as an exercise for the reader the further reduction of this definition by treating q as $\bullet(\text{Ø}\bullet m)$].

At any rate, with the new and correct definition of the E-field, one can see that the flow of displacement current (d**Ø**/dt) upon a collector such as a rigid capacitor, containing a fixed charge $\bullet(\text{Ø}\bullet m)$, will result in the formation of an excess $\nabla\ \text{Ø}\bullet$ upon those restrained charges in the capacitor plate, so that there is created an $E \equiv -[(\nabla\ \text{Ø})\bullet(q)]/|q|$. Since the conventional theory considers the antigradient of the potential as an E-field, then one can now see the exact mechanism that creates this E-field that grows upon the capacitor (across its plates) as it charges. In fact, the q/|q| cannot change in a capacitor if its plates and dielectric are immovable. Instead, in that case, the $\text{Ø}\bullet$ portion of the trapped $\bullet(q)$ changes, producing the $(\nabla\ \text{Ø})\bullet$ change. Since the $(\nabla\ \text{Ø})\bullet$ component is coupled to the mass component of the fixed $\bullet q$ as $(\text{Ø}+\nabla\ \text{Ø})\bullet m$, then an E-field is created and exists as $E \equiv -[(\nabla\ \text{Ø})\bullet(q)]/|q|$.

An Ideal Capacitor Is an Electron Current Blocker

We point out that, if the capacitor's components are ideal, *completely rigid*, and do not physically move, then the capacitor is a "●dm/dt blocker." If the charges really were frozen in place, then the potential would flow across the plates at the speed of light, via the flow of excess massless displacement current dØ/dt●. In that case, an ammeter would not show the classical "exponential fall-off" of the current with time; the electron current dq/dt would occur as a single-point Dirac delta function at t=0, and would be zero thereafter. And no electrons would be able to move in zero time. The voltage would show an instantaneous adjustment to the charged value with a single step-function, and the capacitor would charge up fully, instantly, with no work (energy loss) whatsoever being done. And this charge-up of the capacitor would not dissipate in the slightest the source furnishing the voltage; there would be no electron current dq/dt through the back EMF of the source, hence no work inside it to deplete its separation of charges.

Problems With Ordinary Capacitors

However, most ordinary capacitors are much more than just an ideal capacitor. The plates move, the dielectric moves, etc. due to the forces created upon them by the E-fields created upon the trapped charges in them. The spatial translation of the resulting force moving the plates constitutes work; i.e., it dissipates some of the flowing dØ/dt energy. Each movement of the plates and/or dielectric carries with it all its internally trapped charges. The movement of those charges constitutes a substantial longitudinal electron current dq/dt, when compared to the longitudinal "drift" electron current in normal circuits. [Electrons spend most of their time moving radially in a wire, not down it.] This "moving plate and its transported charges" make an electron current, which pumps the inert electrons in the ground return line back through the back EMF of the source, depleting the source. Consequently, the ordinary capacitor will simply release as much energy as work (to move the plates and dielectric) as it stored. Hence, it will also produce dissipation of the source via the amount of energy stored in the capacitor. You still get "free energy" stored in the capacitor, but also dissipate the source by an equal amount.

Rigidized Capacitors Must Be Used

Only rigidized capacitive collectors are useful in free energy devices. Such capacitors are in fact actually available, e.g., as calibration standards, but they are extremely expensive ($400 to $2,000 or so each, for a capacitance reaching about 1 uf).

So, capacitive type collectors must be rigidized, if used in overunity circuitry. Even so, in a single integrated circuit, although one collects free energy, one will use half of what was collected to dissipate the source. Not all the remaining half will be discharged through the load; some will be discharged in other circuit and component losses. Hence, there will always be less work done in the load than is done in the source to kill it, by a conventional two wire single closed circuit. In my second referenced paper (Feb.94), I included precise proof that this is true. One must use energy collection and shuttling between two isolated circuits, and the load discharge current must not pass back through the primary source of potential.

We have previously provided precisely how to utilize capacitive collectors in our two referenced papers. We point out here that the capacitors must be calibration standard capacitors, or specially made rigidized capacitors.

It Does Not Require Electron Current to Charge An Ideal Capacitor

For the benefit of the skeptic, this is already proven. We simply list references (2) and point out the equation that represents the energy K in a charged capacitor. Here we have $K = ½(CV)^2$. It is totally the displacement current
dØ/dt• flowing (from a higher potential) onto the charging plate that produces the higher potential **Ø** on that charging plate, and hence a V between the two plates, one of them (the "ground" side) being held at a constant potential. <u>The mass displacement current component dm/dt of the electron current dq/dt has nothing whatsoever to do with energy accumulation; it has only to do with the dissipation of energy that is happening simultaneously in all losses and loads in the circuit loop</u>.

We reiterate that most ordinary capacitors have terrible internal movement, and accomplish as much energy dissipation as they do energy collection by permitting dq/dt and work performed upon the plates and dielectric to move them. The standard two-wire circuit also guarantees that all such dq/dt current "through" the capacitor is passed back through the source against its back EMF, doing an equal amount of work in the source to dissipate its separation of charges and "destroy" the source.

An ideal capacitor does not pass dq/dt, but only massless displacement current as theorized by Maxwell to save current continuity in a circuit containing a capacitor, and hence to save Ampere's current law. That is, an ideal capacitor is a •dm/dt blocking device. However, the capacitors utilized in normal circuits are not ideal capacitors at all. By allowing the plates to move, electron current dq/dt is created on both sides of the capacitor. Otherwise there would not be a ground return dq/dt, but only a ground return dØ/dt•. This dØ/dt• would not and does not push electrons back up through the source against its back EMF; else the ground side of the source, which is engaged in continuous dØ/dt• exchanges with the vacuum, would produce destructive amperage dØ/dt• in the battery or potentialized source, against its back EMF, while it was simply sitting on the shelf. In fact, a flow of dØ/dt• continually runs from the vacuum to the positive terminal, then through the inside of the battery to the negative terminal, and thence back to the surrounding vacuum. Also, the incoming flow from the vacuum "splits" at the positive terminal, where one branch flows inside the source to the negative terminal, and the other branch flows through the external circuit to the ground return line, and thence to negative terminal and back to the vacuum. In the external circuit, the dØ/dt• hooks to free electrons and moves them as ordinary dq/dt. In the internal circuit inside the source, the electrons are restrained, hence they only move when their restraint is overcome.

Displacement Current dØ/dt Is Real

In recent years, SQUID detectors have been utilized to detect the magnetic field created between the plates (at right angles) by the displacement current dØ/dt between the plates, providing strong evidence that displacement current is physically real. The best proof that it is real is a charge blocking device, two isolated circuits using energy collection and shuttling, and overunity powering of loads in the secondary circuit.

A Problem With Ammeters and Measurement of dØ/dt

Note that an ammeter cannot differentiate between displacement current dØ/dt• and normal current dq/dt. In the ammeter, the sample dØ/dt• will couple to free electrons, producing a normal dq/dt inside the ammeter. The driving of this dq/dt through a precision resistance, e.g., is measured and the instrument is calibrated to show the dq/dt amperes flowing. One of the major needs of free energy researchers is the development of a good current meter that will differentiate between dØ/dt• and dq/dt, and measure each one. Short of using a mass spectrometer to differentiate the mass current •dm/dt, and comparison of those mass current measurements with an ammeter's measurements of the "current" dq/dt, and calculating the dØ/dt• from that, I presently know of no way to precisely and simply measure and separate the two current components. I have been thinking of utilizing a multi-channel sampling meter set arrangement, where one channel uses a •dm/dt blocking device such as the Fogal semiconductor in this respect, but have not yet developed the complete concept.

Better Solution: A Charge Blocking Device

A better solution than the capacitor or capacitive collector is the use of a special rigid solid state "charge blocking device", such as a Fogal semiconductor, to enable the current separation into two components, blocking of the mass flow component, and passage of the massless displacement current component. <u>*In overunity electrical devices, it is massless displacement current dØ/dt• that must be separately passed down the primary circuit and collected in the collector as an E-field or an H-field. This provides "free" energy that has been extracted from the vacuum, via the potential difference between the terminals of the source antenna, and collected and stored in the appropriate field, without work*</u>. The collected free energy may then be transferred to the isolated load circuit by a variety of means, for separate discharge through the load without return of dq/dt through the source.

The Fogal Semiconductor Meets the Charge-Blocking Requirements

Fogal's marvelous semiconductor blocks passage of electrons into its output terminal, but passes displacement current dØ/dt• into it. The semiconductor is powered by (receives) normal electron current and excess dØ/dt•, but outputs pure massless displacement current dØ/dt•. A charge blocker that passes dØ/dt• is ideal for our overunity mechanisms, enabling them to be readily obtained as we shall shortly see.

Energy, Flow, Finite Amount of Energy, and Collectors

We accent that the flow of <u>energy</u> in an electrical circuit is purely by means of the massless displacement current component (dØ/dt)•. The flow of the mass component •(dm/dt) represents the "flow of work" (<u>*energy dissipation*</u>) in the circuit. Power is rigorously the time rate of doing work, and electron current dq/dt is a part of power. It has nothing whatsoever to do with the time rate at which *energy is transported without loss*; instead, power represents the rate at which energy "leaks" or is "lost" during its transport.

All measurement is work, not energy. Energy cannot be measured, even in theory, a priori. Energy is also a flow process, and never a finite amount in one location. A specific differential of energy flow may exist on a specific finite collector. However, it only represents a certain constant differential amount of energy flow compared to the universal vacuum energy flow or some other flow reference point. It is like a whirlpool in the river. Energy is like the flowing water, and an "amount" of energy is like the amount of water in the collecting whirlpool form (between its input flow and its output flow) at any time. Obviously, energy (ordering) forms can come and go; the water flow itself remains. Any "magnitude of energy" is always a "trapped" amount of energy in a "collector" (form).

Decoupling Current Components and Utilizing dØ/dt

The two components of electron current dq/dt can be decoupled, by blocking the •dm/dt component while allowing the dØ/dt• displacement current to continue to flow. In our first paper, we pointed out one way: utilizing a special degenerate semiconductor material whose electron gas relaxation time is extended, providing a finite time during which the material serves as a *charge (i.e., a charged particle) blocking device*, while passing the flow of potential (the dØ/dt• massless displacement current component) and restraining the mass displacement current component •dm/dt. With the advent of Fogal's semiconductor, the process becomes much easier to obtain and utilize in practical machines and circuits.

In our second paper, we pointed out a second way: utilize an ordinary capacitor and ramp-up step-charging. We found, however, that in most ordinary capacitors, the capacitive aspect is defeated by the sloppy movement of the plates and dielectric, converting dØ/dt• into dq/dt. Only a few very carefully selected capacitors are sufficiently rigid and can provide overunity. One must use *rigidized* calibration standard capacitors for the ramp-charging by series steps method to be successful. With ordinary capacitors, however, one can readily demonstrate that the efficiency can approach 1.0 rather than 0.50 as expected.

Overunity Secrets: Charge Blocking, Collection, Shuttling, and Two Isolated Circuits

The charge (actually *charged mass*) blocking approach provides a massless, free flow of vacuum EM energy that can be directed to a collector (capacitive or inductive) where it can be stored in either an E-field or a B-field. This stored energy can then be transferred to an isolated load circuit whose electrons (and hence their •dm/dt mass displacement current) are free to flow as dq/dt. In the isolated load circuit, then, the two components [(dØ/dt)•(dm/dt)] again couple to form i = dq/dt = [(dØ/dt)•(dm/dt)], powering the load. All work in an electrical circuit is due to the mass displacement current •dm/dt component; the massless displacement current (dØ/dt)• is a flow of pure energy transport without loss, as is well-known. (For example, see Reference 4.)

Therefore, the first major free energy secret is simply to block the "working" component •dm/dt of the current dq/dt while allowing the excess "lossless energy flow" component dØ/dt• to flow to collectors to produce either free E-field or free B-field thereupon.

The second major secret is to transfer the collected excess free energy (via energy shuttling) to a second, isolated, load circuit, where the energy is discharged through the load in the conventional fashion (i.e., such that the two current components are coupled, and electron current i = dq/dt occurs through the load). The second circuit must be isolated from the original collection circuit, so that none of the load electron current dq/dt passes back through the original source, against its back EMF.

Should the grounds be the same between the load circuit and the collection circuit so that load electron current is returned through the back EMF of the primary source, then exactly as much excess work will be done inside the source to dissipate its separation of charges as was done in the external load to furnish useful work and in the external losses. In that case, overunity is destroyed, because one is using one-half the excess free energy to destroy the source faster, while the remaining half is distributed among all external loads and losses. Since there are always some external losses besides the load, then the ratio of load power to source dissipation power is always less than unity in a conventional closed-loop circuit containing both load and source. Hence the necessity for utilizing two isolated circuits: one where energy is collected freely from the source, and one where energy is dissipated as work in the load without dissipative work in the source, and energy shuttling between them.

A Simple Open-Loop Overunity Device

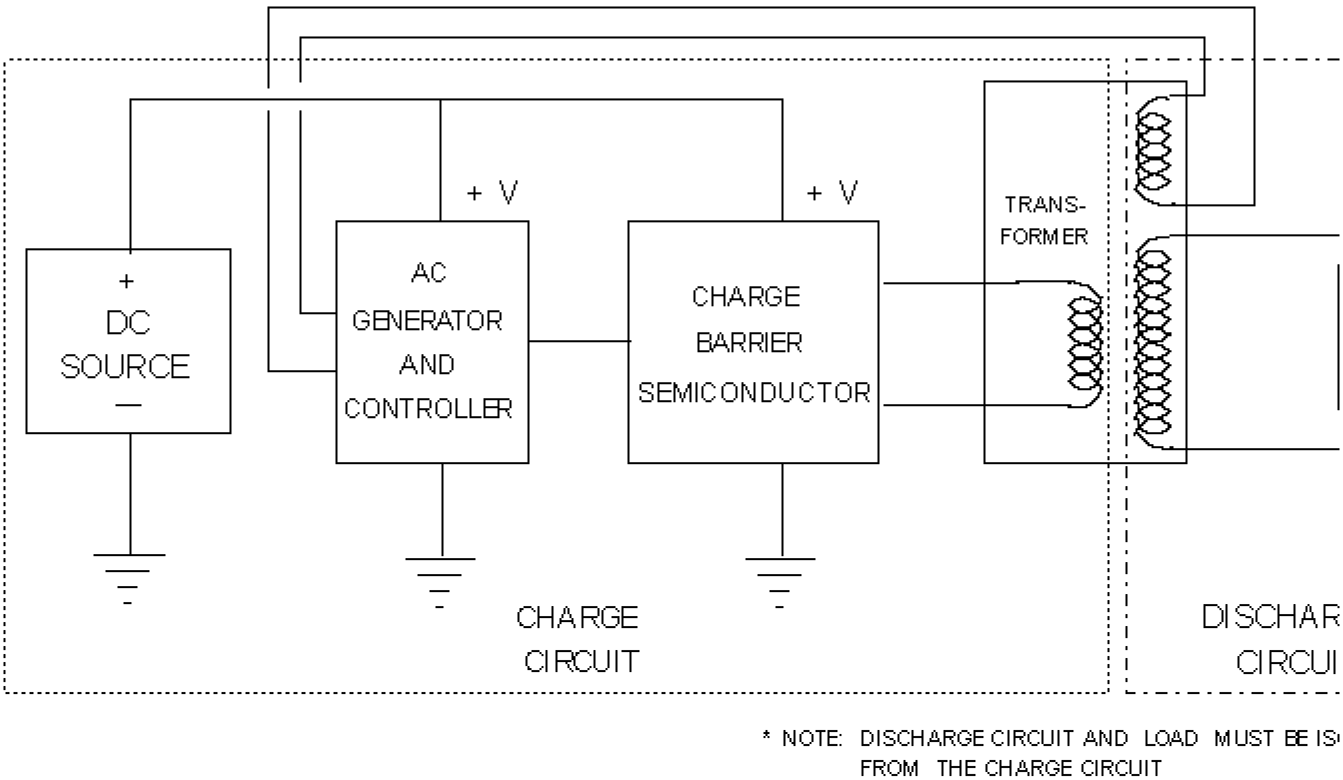

Figure 1. Use of Charge Barrier Device to Achieve Overunity in a Shuttle Circuit.

Figure 1 shows a very simple but very powerfully amplified overunity device, using an AC charge blocking semiconductor (CBS) (such as a Fogal semiconductor). The gist of the circuit is that an AC source furnishes AC current dq/dt to the CBS, which uses some of the power to power itself, but then blocks the •dm/dt portion of the dq/dt input current, passing only the massless displacement current component (dØ/dt•) into its output circuit. The (dØ/dt•) output of the CBS is fed through the primary winding of a transformer, in this case a step-up transformer. The "current gain" of the CBS will depend upon (1) the load connected to it, and (2) the ability of the CBS to continue to block the increasing E-field on its trapped charges, as more free energy flow (dØ/dt•) is drawn through it by the load. Thus the load and the CBS must be matched within the operational ability of the CBS, so that the CBS does not fail catastrophically.

In the primary winding of the transformer, the (dØ/dt•) displacement current produces a magnetic field H, storing the excess flowing energy in that field. This is a normal magnetic field; all magnetic fields are produced by the (dØ/dt•) component of the current anyway. This magnetic field, as it changes, couples to the secondary winding, producing a normal magnetic field H therein by normal means. In the secondary circuit, electrons are not restrained by a CBS. Hence the (dØ/dt•) induced in the circuit on the secondary side couples to the unrestrained electrons, producing normal electron current dq/dt, and driving it through the load to power it. Note that *energy* is conserved across the primary and the secondary; however, *dissipative power and work* (energy loss rate and energy loss) are not conserved, because a free flow of lossless excess energy in the form of displacement current is flowing from the vacuum through the source antenna, thence to the CBS, through it to the primary of the transformer and into the primary magnetic field, through it to the secondary magnetic field, through it into the (dØ/dt•) induced in the secondary circuit and coupled to the electrons, through the resulting dq/dt into the load, where the scattering of photons as heat dissipates the free flowing energy in the displacement current dØ/dt• component flowing through the load as a component of dq/dt = (dØ/dt•)•(•dm/dt) = (dØ/dt)•(dm/dt).

Free "Power" Amplification

If one places an ammeter in the output from the CBS, between it and the primary winding of the step-up transformer, one will read the (dØ/dt•) as *normal dq/dt in the ammeter itself*. If one calculates the "free power" (i.e., the rate of energy dissipation) that is going into the transformer primary using this as the "current," one will show that energy and "power" are conserved between primary and secondary of the transformer. However, the actual dissipative power going into the primary side is zero or, in real circuits, vanishingly small. Consequently, the device has a very high variable power gain that depends upon the rate of energy draw and dissipation of the load on the secondary side. If one adds more load, one draws more dq/dt current on the secondary side, hence more excess dØ/dt• displacement current on the primary side. The overall "power amplification" is limited by the ability of the transformer to handle the power in the secondary and the ability of the CBS to withstand the pressure of the internal charge barrier. This device can be easily "close-looped."

The Negative Resistor: A Close-Looped "CBS and Shuttle" System

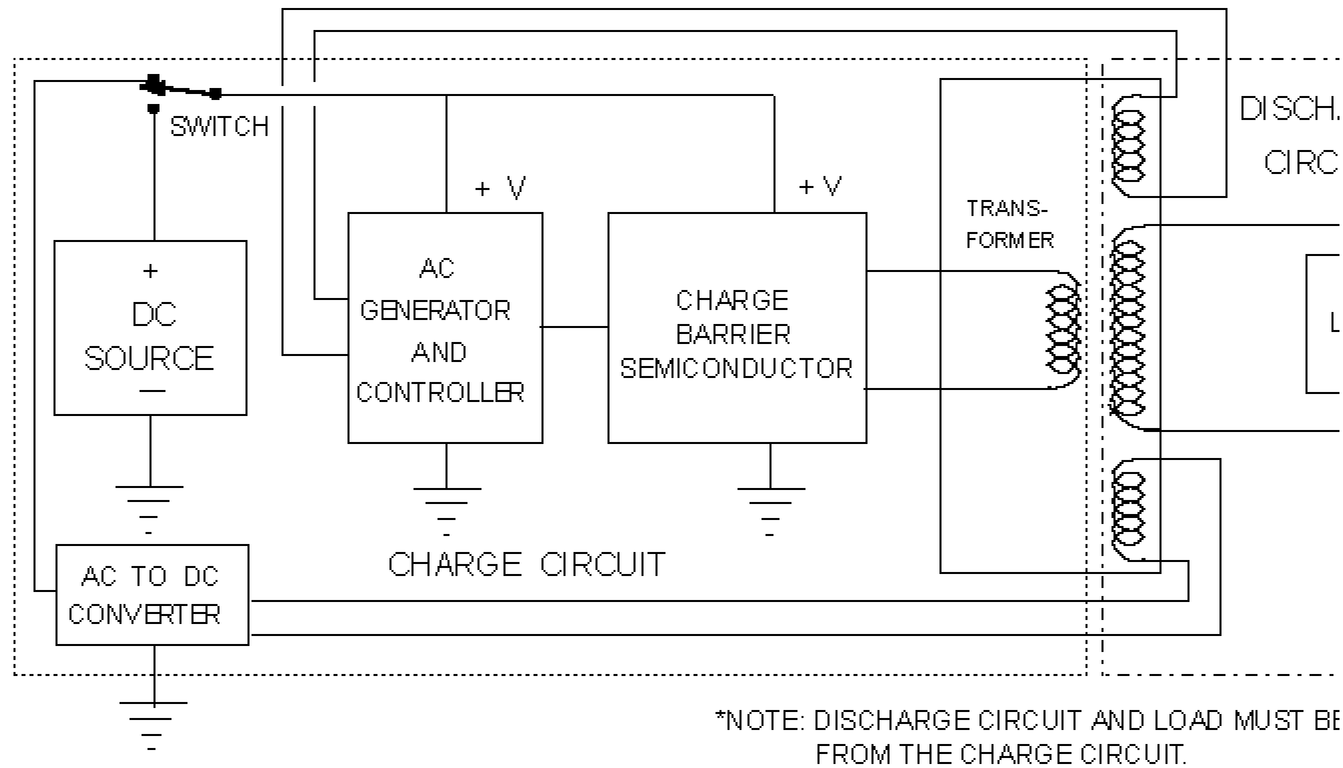

Figure 2. Use of Charge Barrier Device in a Shuttle Circuit With Controlled Feedback, to Achieve a True Negative Resistor.

Figure 2 shows the close-looping of the device shown in Figure 1, in such manner that, once stable operation is underway and the load and input stabilized, the ordinary power supply for the CBS can be switched out of the circuit. In this case, the circuit operates as a self-powered overunity device; i.e., as a *negative resistor*.

A normal resistor receives an ordered energy flow from its external circuit and scatters this energy as work out to the vacuum. I.e., it receives $i = (\O + \nabla\O)/dt \bullet (dm/dt)$ (scatters the excess $(\nabla\O)/dt \bullet$ component (i.e., of the dq/dt passing into it from the high potential side) by radiating it away to the surrounding vacuum as scattered photons (heat)), and outputs inert (no excess $(\nabla\O)\bullet$ component) electron current dq/dt into the ground side.

A negative resistor does exactly the opposite: it accepts inert incoming electrons from its "ground" side, also accepts incoming (converging) $d\O/dt\bullet$ energy from the vacuum as virtual photons being absorbed upon these inert electrons so that a $\nabla\O\bullet$ is added to the electron current, creating an excited, excess energy-carrying $i = (\O + \nabla\O)/dt \bullet (dm/dt)$, and passes this excited current out of its high side and out into the external circuit to power the circuit. In other words, the negative resistor becomes a *self-contained free power source*, once brought up to stable operation.

In Figure 1, all that needs to be done is simply to extract some of the secondary power and feed it back to create the power input consumed by the CBS and the other normal components of the primary circuit side of the transformer.

Multitaps can be added to the secondary side, to provide varying voltage power supplies for loads requiring different voltages.

Energy is conserved in the device, because it always functions as an open circuit, receiving excess energy from an external source (the surrounding vacuum, in its virtual photon exchange with the charges in the system). It is far from thermodynamic equilibrium, and classical thermodynamics (including the second law) does not apply.

It is simply a continuous free power supply: it is a *negative resistor*.

Far more complicated units can be designed and produced. The basic point is that this type of overunity power supply is continuous and self-powered, driven by the violent exchange of energy from the vacuum, and simply collecting and gating some of that energy to the load to power the load.

Conclusion

With this third paper, we complete the triad of papers we set out to write a little over a year ago. With the availability of charge barrier devices such as the Fogal semiconductor, together with the collection, shuttling, and use of free dØ/dt• flowing energy, the *Age of Free, Clean, Electrical Energy* has finally dawned.

Let us use it wisely, and for the betterment of humankind, not for its destruction.

[Support of portions of this research by A.D.A.S. is gratefully acknowledged.]

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