

# **HOW TO BUILD SOLID-STATE ELECTRICAL OVER-UNITY DEVICES**

REV. 2.0a

William Alek  
**INTALEK, INC.**

3506-43rd. Place  
Highland, IN  
46322

CONTACT INFO:  
PHONE: 219.924.2742  
EMAIL: [alekws@intalek.com](mailto:alekws@intalek.com)



# ABSTRACT

Electrical coil-based devices that use Free Energy or Over-Unity effects require a unique understanding when determining their "correct" operation.

These devices can be placed into three unique categories. The first category are classic coils that use ferromagnetic (iron alloy) core material. These devices typically have a COP (Coefficient Of Performance) less than unity. The second category are coils that use ferromagnetic cores and opposing and/or orthogonal magnetic fields applied by permanent magnets (pms). These devices typically have a COP close to, but NOT greater than unity. The third category are coils that use ferromagnetic cores and/or pms in a special configuration, and have unique operating requirements. These devices have a COP greater than unity.

The purpose of this paper is to present the "hidden" mechanism that is at work in these devices which causes them to produce excess electrical energy.

# THE DEFINITION OF COP

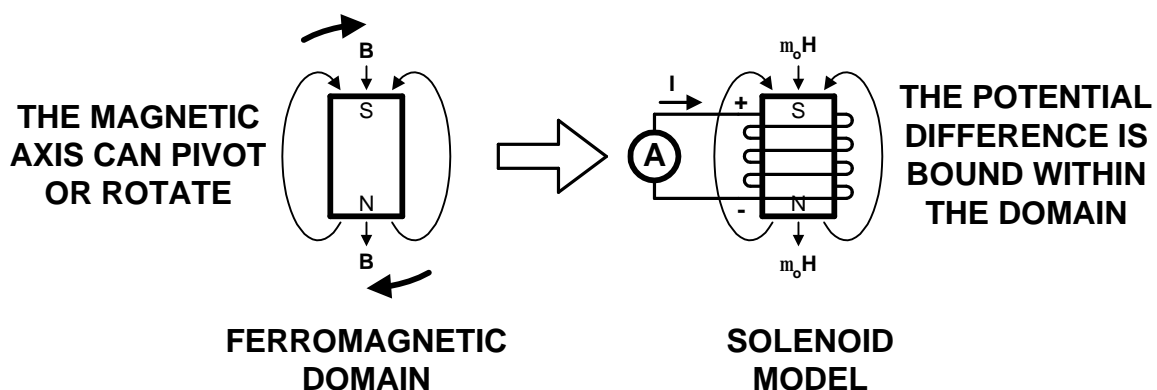
The Coefficient Of Performance, or COP, is a unitless number, and is expressed as a ratio of the energy out divided by the energy in.



$$\text{COP} = \frac{E_{\text{OUT}}}{E_{\text{IN}}} \quad \text{or} \quad \text{COP} = \frac{\dot{P}_{\text{OUT}} dt}{\dot{P}_{\text{IN}} dt}$$

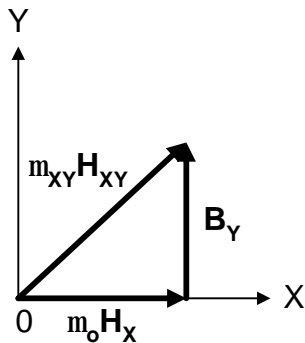
# FERROMAGNETIC DOMAINS

A ferromagnetic domain of iron alloy core materials can be modeled as an **ideal "unity-gain" solenoid**. The key words here are unity-gain, meaning that the domains are in electromagnetic equilibrium with the thermal environment. External coils can mutually couple to these domains, thereby increasing its' inductance, and as a consequence, its' energy.



# ORTHOGONAL MAGNETIC FIELDS

Magnetic fields are represented as vectors. Adding orthogonal magnetic fields using permanent magnets will "**increase the permeability  $m$** " of the ferromagnetic core material. As a consequence, the inductance and the energy of the coil increases. The results are a higher COP value.



**INCREASING PERMEABILITY:**

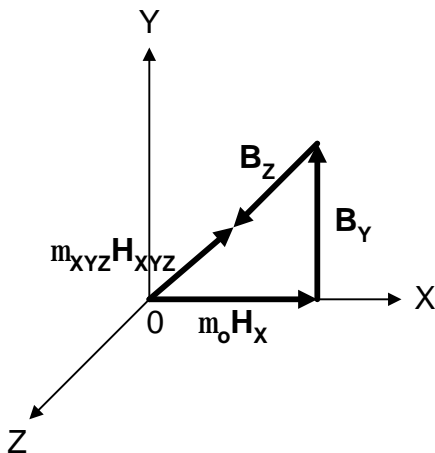
$$m_{XY} > m_0$$

**INCREASES INDUCTANCE:**

$$L_{XY} > L_{IN}$$

**INCREASES OUTPUT ENERGY:**

$$E_{XY} > E_{IN}$$



**INCREASING PERMEABILITY:**

$$m_{XYZ} > m_0$$

**INCREASES INDUCTANCE:**

$$L_{XYZ} > L_{IN}$$

**INCREASES OUTPUT ENERGY:**

$$E_{XYZ} > E_{IN}$$

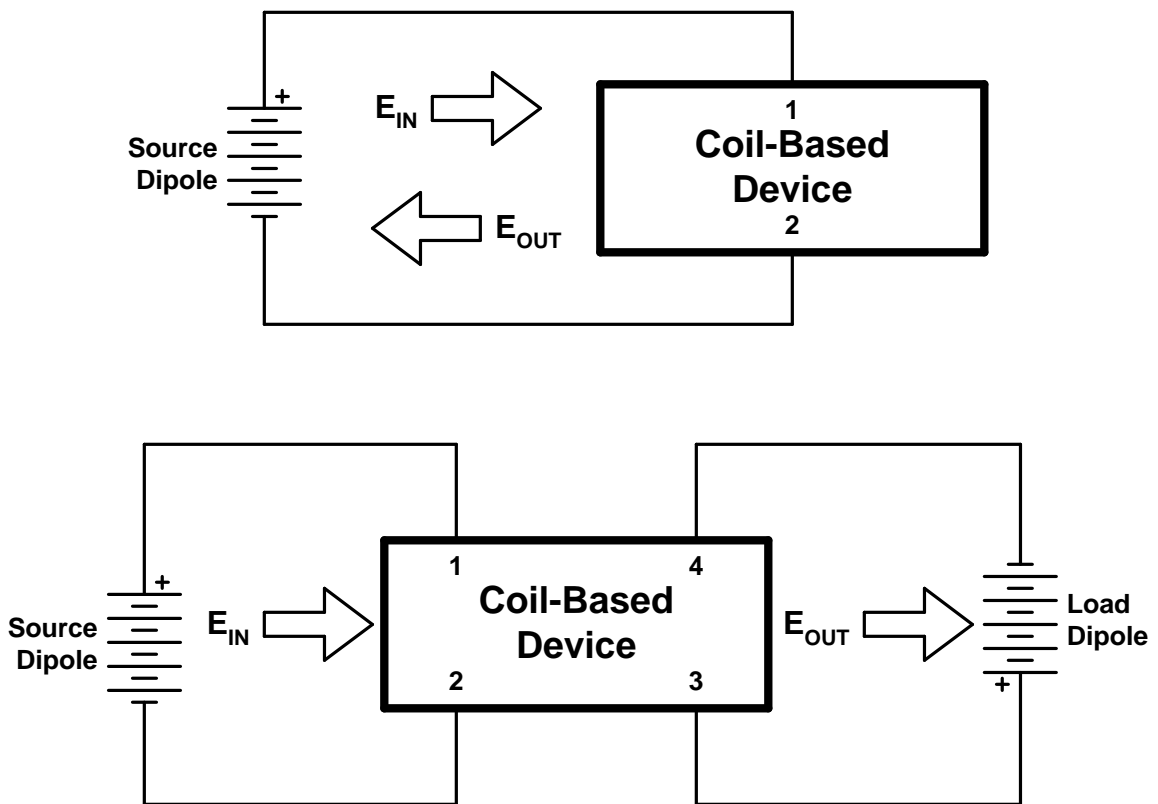
# PERFORMANCE METHODS

CATEGORY	DESCRIPTION
<b>1</b>	<p><b>Under-Unity Devices, COP &lt;&lt; 1.00</b></p> <p>Coil/Core - Classic Devices</p> <p>Classic use of magnetic fields applied to ferromagnetic (iron alloy) core materials.</p>
<b>2</b>	<p><b>Near-Unity Devices, COP &lt; 1.00</b></p> <p>Coil/Core/Magnet - SmartPAK POD, POD</p> <p>Opposing/orthogonal magnetic fields applied to ferromagnetic materials.</p>
<b>3</b>	<p><b>Over-Unity Devices, COP &gt; 1.00</b></p> <p><b>A</b> Coil/Core - SmartPAK ZPOD</p> <p>Electrostriction/magnetostriction phenomena of ferromagnetic materials. Cooling of ferromagnetic material is observed. A "negative" Carnot cycle is occurring within the material</p> <p><b>B</b> Coil/Core/Magnet - SmartMEG, MEG, PP</p> <p>Full flux transfer magnetic core anomaly. This phenomena is related to the nature of flux flowing within the magnetic material.</p> <p><b>C</b> Coil/Core/Magnet - H. Kunel, Adams Motor</p> <p>A variable reluctance control of magnet in a Category 2 Near-Unity device.</p>

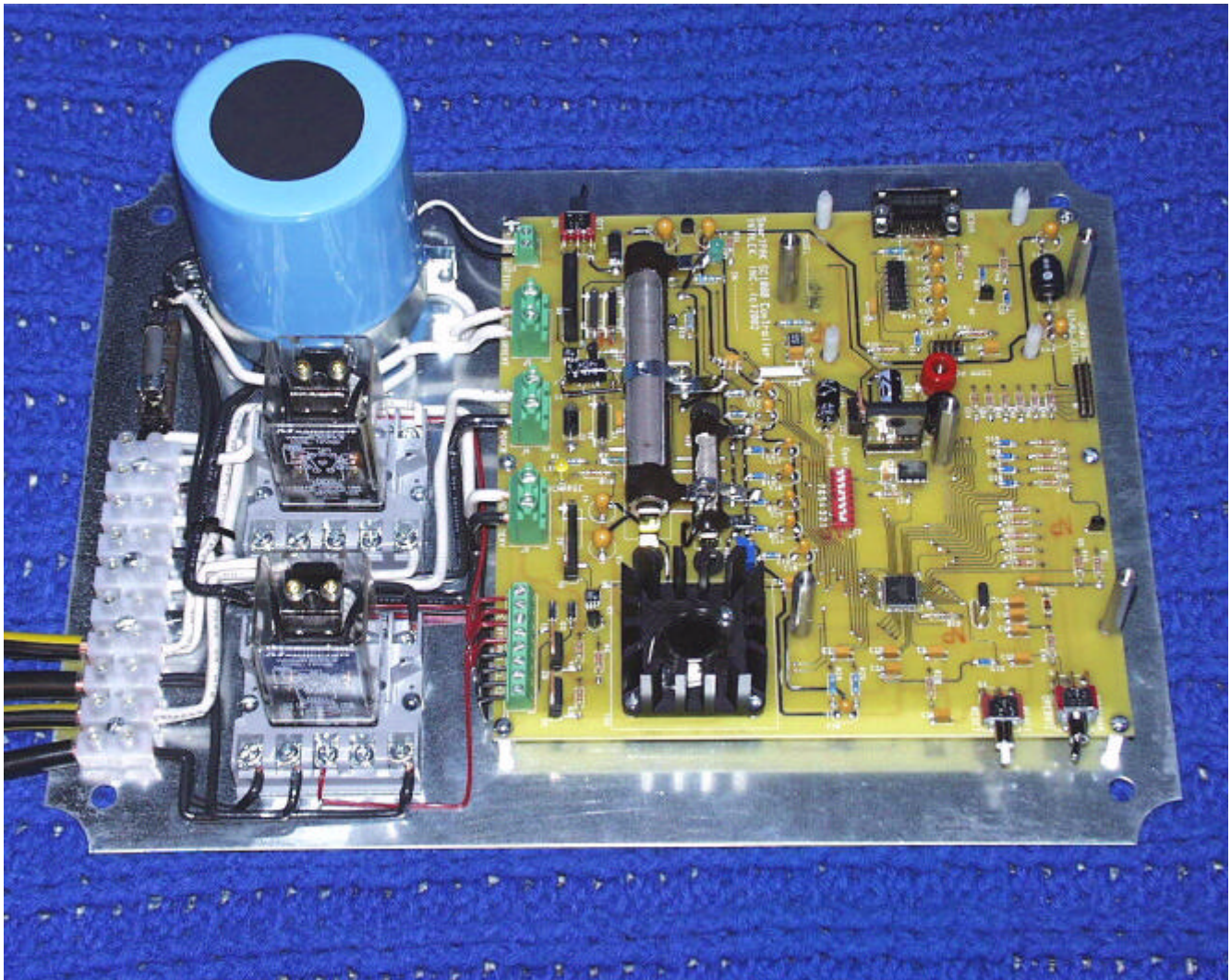
# A SYSTEM REQUIREMENT: THE "SOURCE DIPOLE"

The source dipole, defined as a forced separation of electric charges, serves as a "starting engine" for all these devices. A source dipole may be a battery, a charged capacitor, or any stored-electrical medium. A CATEGORY 1 Under-Unity device or a CATEGORY 2 Near-Unity device will eventually deplete, or collapse its' source dipole over time. However, a CATEGORY 3 Over-Unity device can be configured to maintain, or replenish its' dipole.

## TWO AND FOUR TERMINAL DEVICES



# R&D PLATFORM: THE SmartPAK™ CONTROLLER



## DESCRIPTION

SmartPAK™ is the world's first all solid-state FREE ENERGY or OVER-UNITY power management system that transforms ambient thermal environmental energy to excess electrical energy. It provides a "standard" platform for experimenters, researchers, and developers to do energy-related practical applications, experiments, and perform exploration of the OVER-UNITY phenomena.

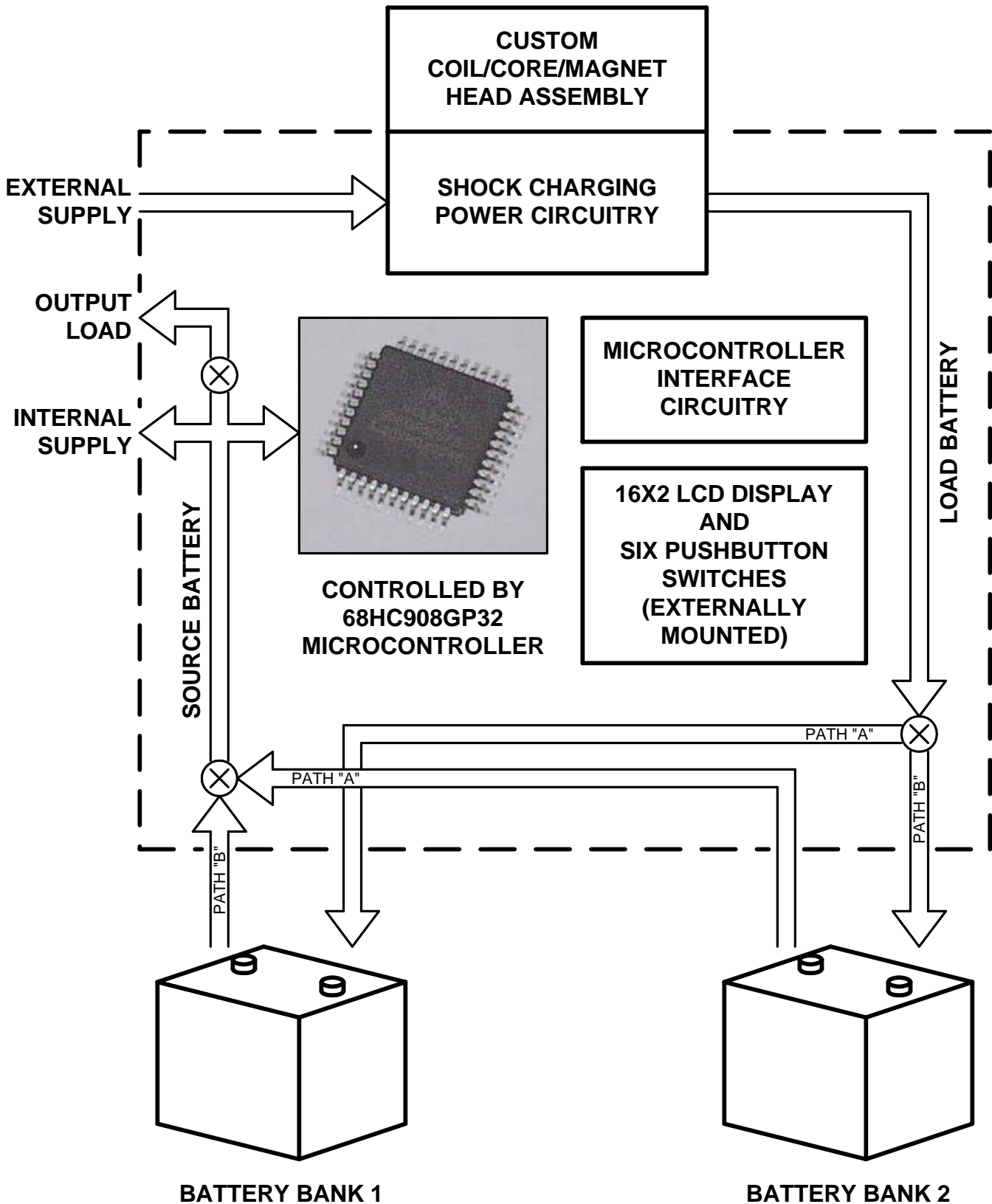
The theory of operation is based on the difference of energy between magnetization/de-magnetization cycles of ferromagnetic materials utilizing a coil/core or coil/core/magnet Head assembly. It has been discovered that EXCESS energy is released during the de-magnetization portion of the cycle using a suitable core assembly. The SmartPAK™ system is specially designed to measure, collect, and store this excess energy for later use.

The SmartPAK™ system is controlled by a Motorola 68HC908GP32 microcontroller programmed to measure input/output voltages and currents, calculate COP, and contains software algorithms for a complete "turn-key" power management system. The system features a "standard" user interface, which allows the user to design their own custom coil/core/magnet "head assemblies", and immediately test and display in real-time its' performance.

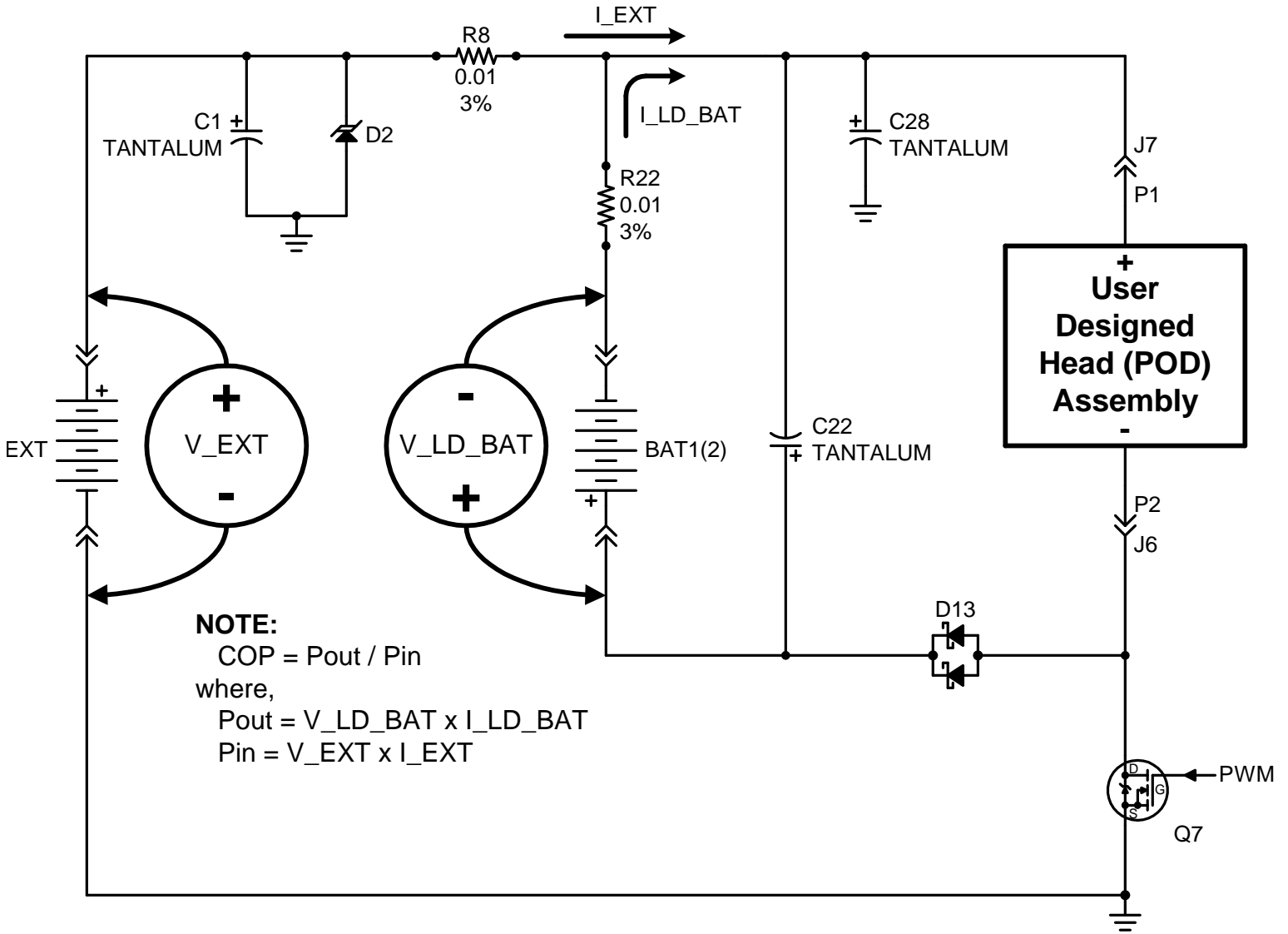
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# FUNCTIONAL BLOCK DIAGRAM



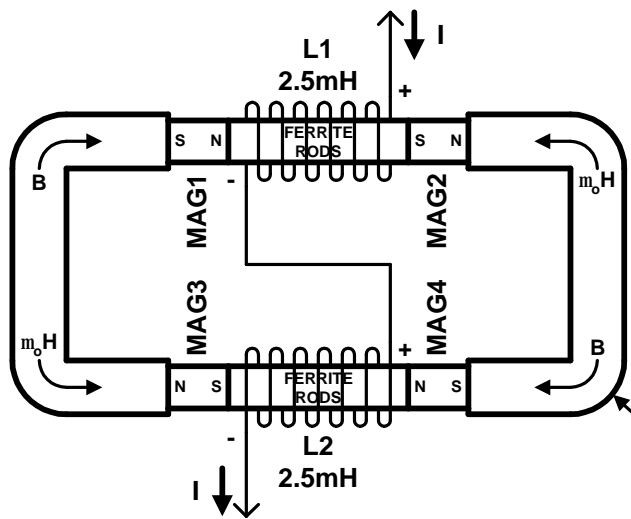
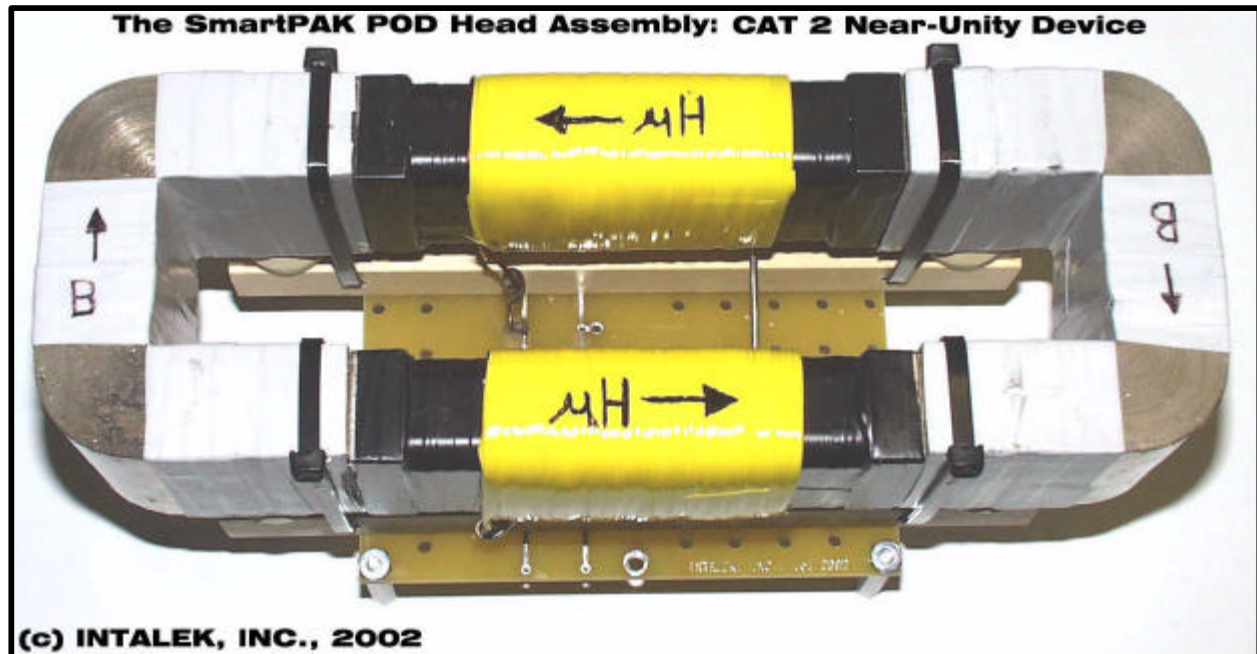
# SmartPAK XX10-XX Coil Driver



**ELECTRICAL DIAGRAM**

**NOTE:**  
 VOLTAGES AVAILABLE:  
 12V, 24V, 36V, and 48V

# THE SmartPAK POD NEAR-UNITY DEVICE



**NOTE 1:**  
 $m_0H$ : Produced by coil L1 and L2.  
 B: Produced by magnet MAG1 - MAG4.

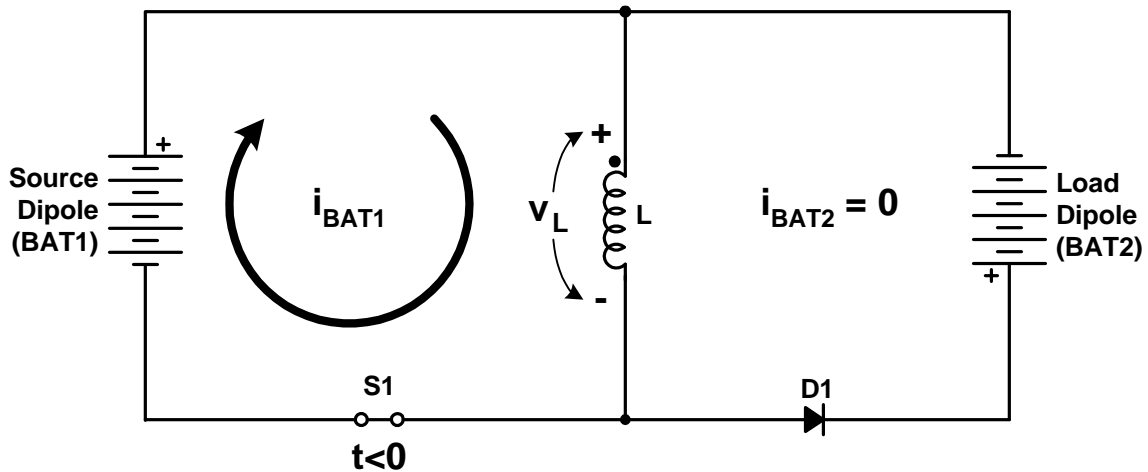
L1 and L2 use 50ft of 16AWG magnet wire each.  
 C-Core: METGLAS, AMCC-500.  
 MAG1 - 4 are NIB type magnets.

**ELECTRICAL DIAGRAM**

The SmartPAK POD is classified as a CATEGORY 2 Near-Unity Device. The coil L1 and L2 fields are mutually coupled to the ferrite rods' magnetic domains, which are magnetized in an opposing direction by permanent magnets.

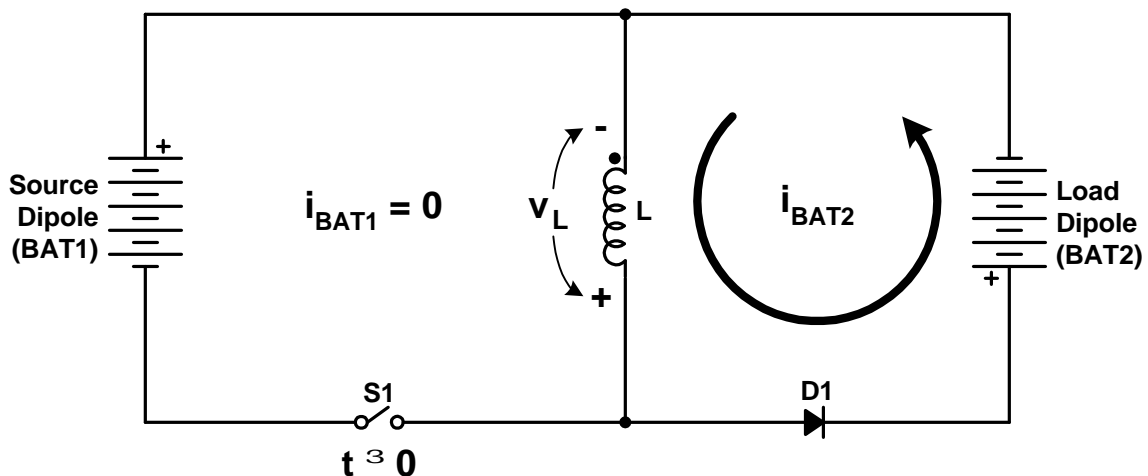
# THE NEAR-UNITY MODEL OF THE SmartPAK POD

With switch S1 closed, the current ( $i_{\text{BAT1}}$ ) flows from the source battery (BAT1) and magnetizes coil L. This action transfers or discharges energy from the source battery (BAT1) and stores it in L.



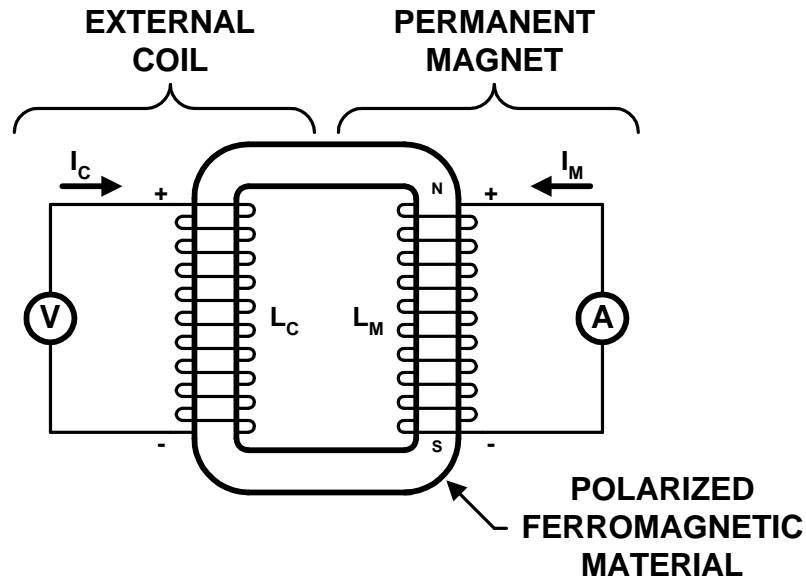
**MAGNETIZATION PHASE OF CYCLE**

When switch S1 opens, the voltage ( $v_L$ ) across the coil L reverses (Lenz's Law) and the energy stored in L flows out as a high-current impulse ( $i_{\text{BAT2}}$ ). Energy is transferred from L to the load battery (BAT2).



**DEMAGNETIZATION PHASE OF CYCLE**

# THE ENERGETICS OF FERROMAGNETISM



CLASSIC TRANSFORMER ANALYSIS

The total field energy of the system is,

$$E_{\text{SYS}} = E_M + E_C - E_{\text{MUTUAL}} \quad 1$$

where,

$E_{\text{SYS}}$  is total field energy.

$E_M$  is energy of permanent magnet (pm).

$E_C$  is energy of coil.

$E_{\text{MUTUAL}}$  is mutual energy between coil and ferromagnetic core coupled to a pm.

Differentiating  $E_{\text{SYS}}$  with respect to time is the total instantaneous power,  $P_{\text{SYS}}$  or,

$$\dot{E}_{\text{SYS}} = P_{\text{SYS}} \quad 2$$

Because  $E_{\text{M}}$  is conserved and does NOT change over time,

$$\dot{E}_{\text{M}} = P_{\text{M}} = L_{\text{M}} I_{\text{M}} \dot{I}_{\text{M}} = 0 \text{ Watts} \quad 3$$

Now, rewriting  $P_{\text{SYS}}$ ,

$$P_{\text{SYS}} = P_{\text{C}} - P_{\text{MUTUAL}} \quad 4$$

So,

$$P_{\text{SYS}} = \underbrace{L_{\text{C}} I_{\text{C}} \dot{I}_{\text{C}}}_{\substack{\text{FLUX} \\ \text{COUPLING} \\ \text{TERM}}} + \underbrace{I_{\text{C}}^2 \dot{L}_{\text{C}}}_{\substack{\text{PARAMETRIC} \\ \text{COUPLING} \\ \text{TERM}}} - M I_{\text{M}} \dot{I}_{\text{C}} \quad 5$$

$\underbrace{\hspace{10em}}_{P_{\text{C}}} \quad \underbrace{\hspace{5em}}_{P_{\text{MUTUAL}}}$

Now, of particular interest is  $\dot{L}_{\text{C}}$  of  $I_{\text{C}}^2 \dot{L}_{\text{C}}$ . For classic CATEGORY 1 Under-Unity devices,

$$\dot{L}_{\text{C}} = 0 \Omega \quad 6$$

However, by "strategically" polarizing the ferromagnetic material, this increases the permeability  $\mu$ , and increases the inductance  $L_C$ . This reveals the "hidden" mechanism that makes these CATEGORY 3 Over-Unity devices,

$$\dot{L}_C \neq 0 \Omega \quad 7$$

Since the coil dissipates power, the instantaneous power  $P_{SYS}$  equates to,

$$P_{SYS} = R I_C^2 + L_C I_C \dot{I}_C + I_C^2 \dot{L}_C - M I_M \dot{I}_C \quad 8$$

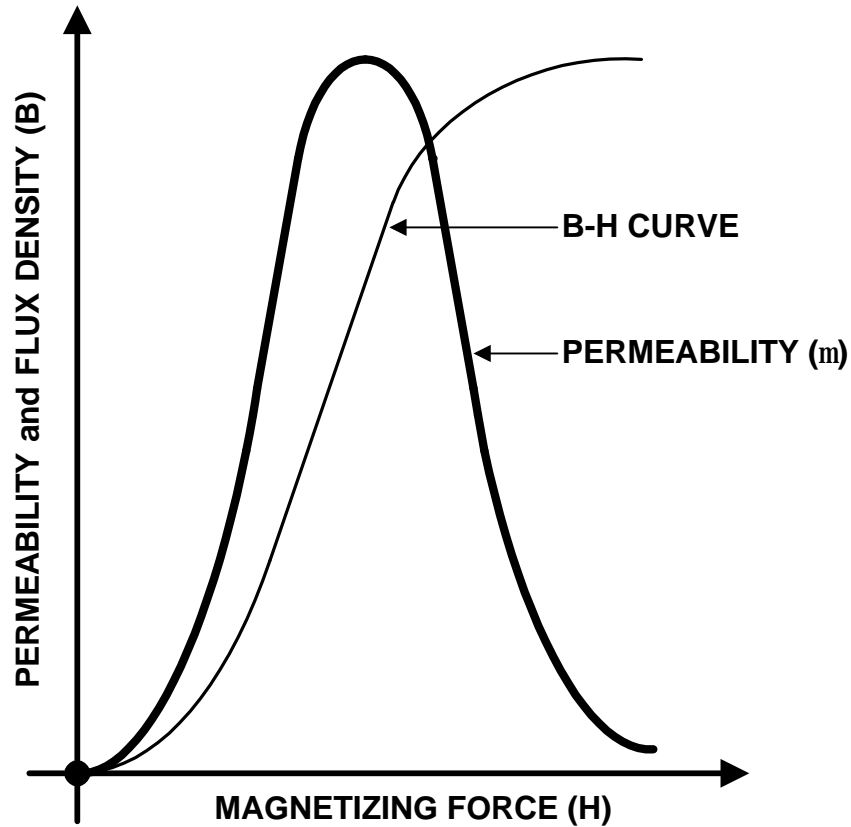
Since  $\dot{L}_C$  has the same units as resistance  $\Omega$ , this resistance may be positive or negative depending upon the slope of  $L_C$ . For example, if  $L_C$  is "**engineered**" to be positive, then the power is positive, however, if  $L_C$  is "**engineered**" to be negative, then the power is negative.

So, integrating  $P_{SYS}$  with respect to time is the total energy,  $E_{SYS}$  or,

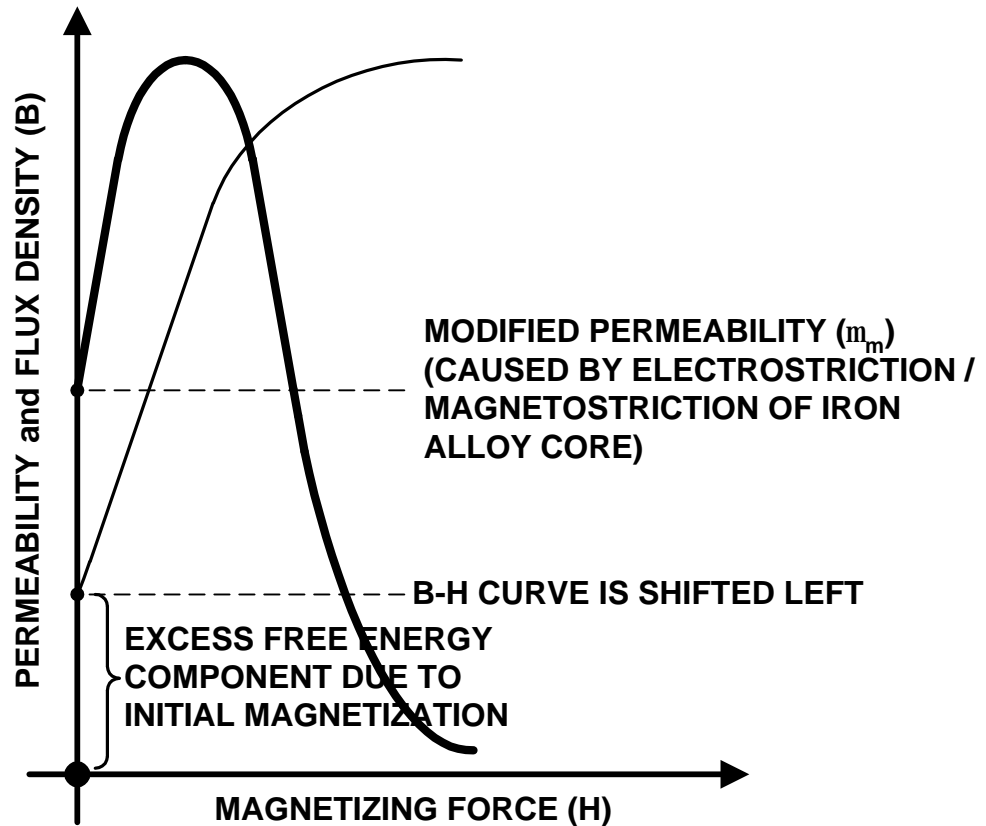
$$E_{SYS} = \int P_{SYS} dt \quad 9$$

In conclusion, given special operating conditions, the ferromagnetic domain can serve as a "hidden" source of energy simply by mutually coupling it to a coil. **The energy is in the form of excess electrical energy, and the domains transforms this energy from the ambient thermal environment.** This causes an observable cooling effect in the domains.

# THE FREE ENERGY "Alek Effect"



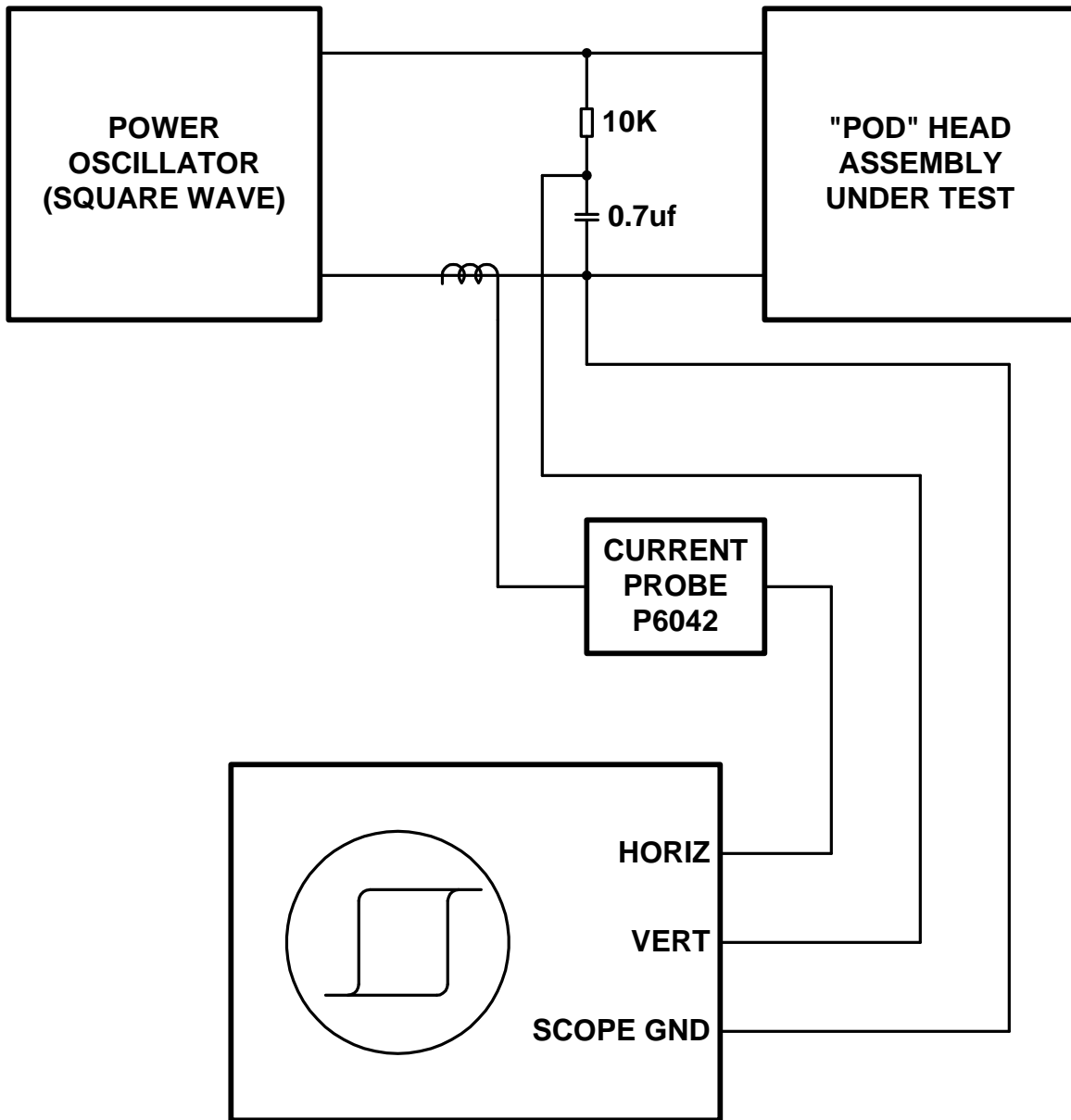
NORMAL VARIATION OF  $\mu$  ALONG MAGNETIZATION CURVE



MODIFIED VARIATION OF  $\mu$  ALONG MAGNETIZATION CURVE

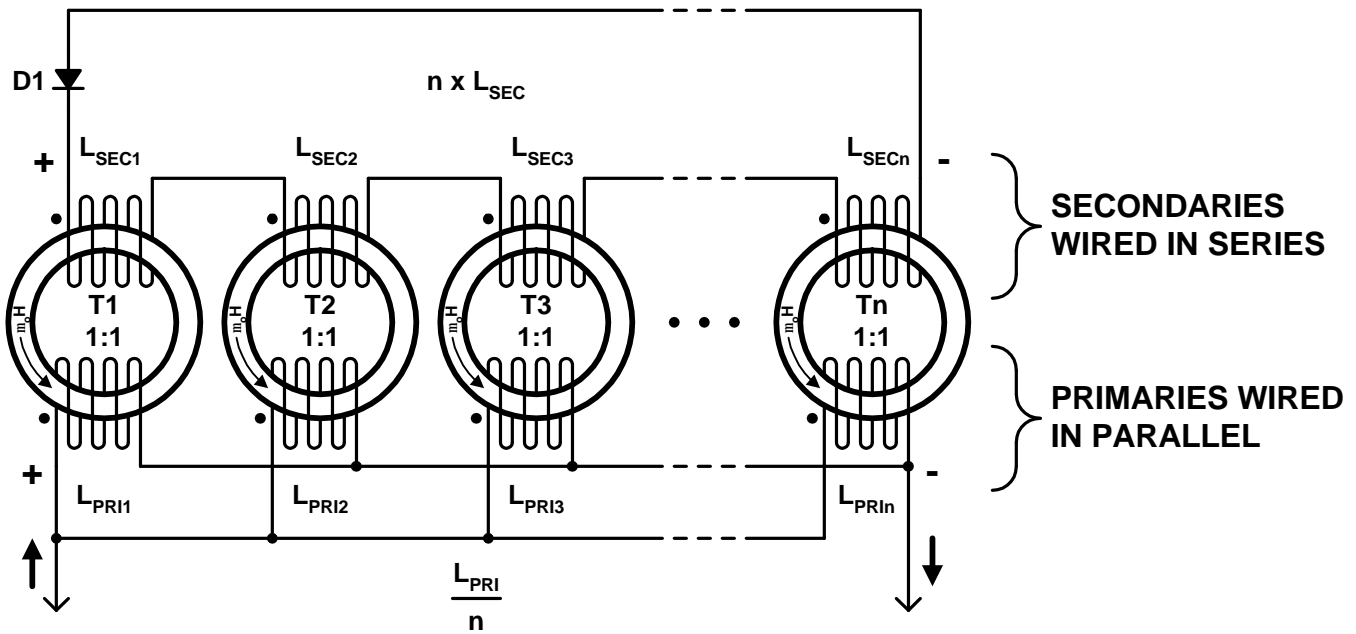


# DYNAMIC B-H LOOP TEST FIXTURE



Engineering  $L_C$  will shift the BH curve either left or right.

# The SmartPAK ZPOD OVER-UNITY DEVICE

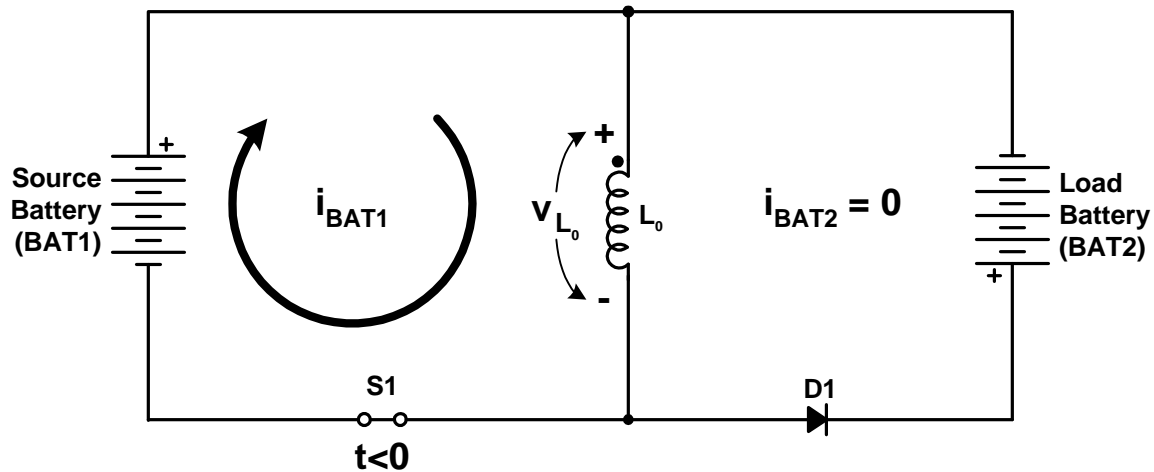


**ELECTRICAL DIAGRAM**

The SmartPAK ZPOD is considered to be a Thompson-Plank PERPETUAL MOTION MACHINE, and is classified as a CATEGORY 3A Over-Unity Device.

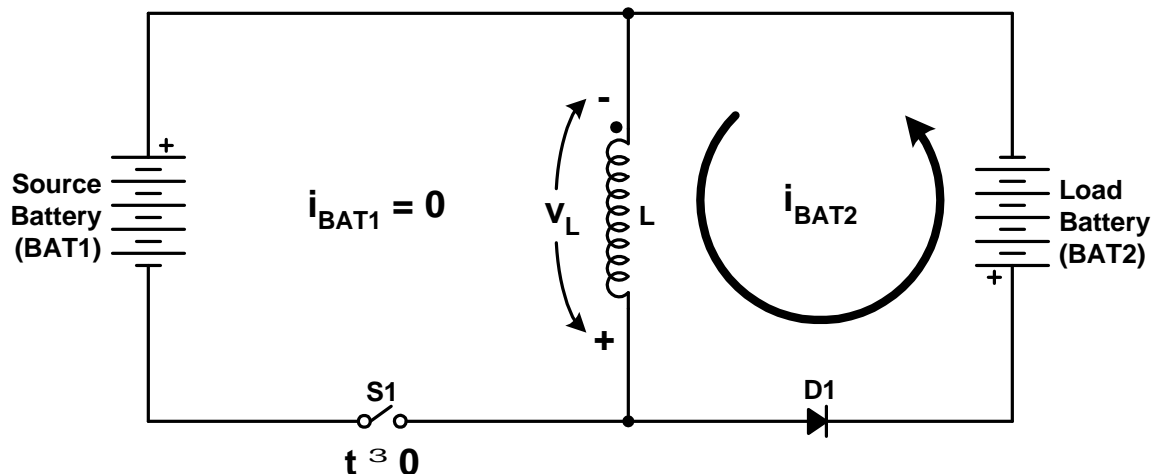
# THE OVER-UNITY MODEL OF THE SmartPAK ZPOD

With switch S1 closed, the current ( $i_{\text{BAT1}}$ ) flows from the source battery (BAT1) and magnetizes coil  $L_0$ . This action transfers or discharges energy from the source battery (BAT1) and stores it in  $L_0$ .



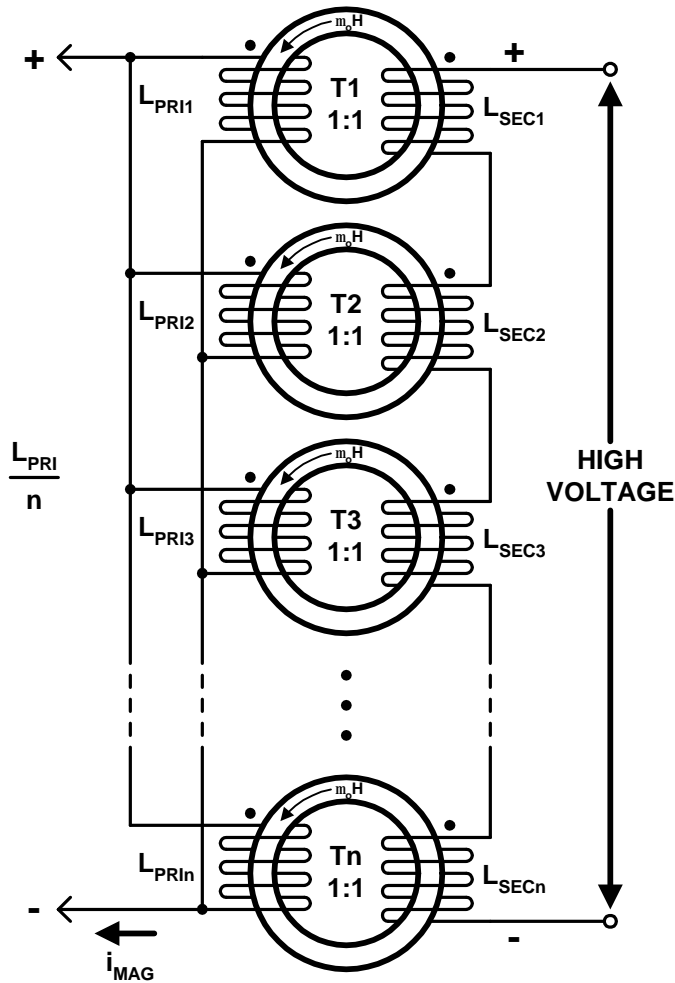
**MAGNETIZATION PHASE OF CYCLE**

When switch S1 opens, the voltage ( $v_L$ ) across the coil  $L$  reverses (Lenz's Law) and the energy stored in  $L$  (increased permeability  $\mu$ , of  $L_0$ ) flows out as a high-current impulse ( $i_{\text{BAT2}}$ ). Excess energy is transferred from  $L$  to the load battery (BAT2).

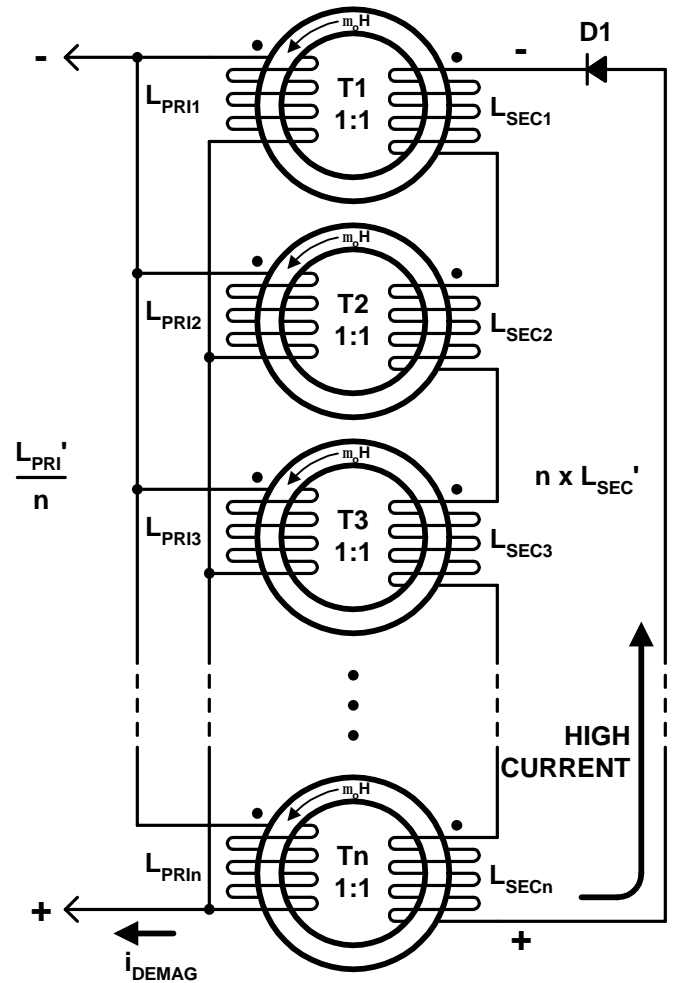


**DEMAGNETIZATION PHASE OF CYCLE**

# THE MAGNETIZATION / DEMAGNETIZATION CYCLE



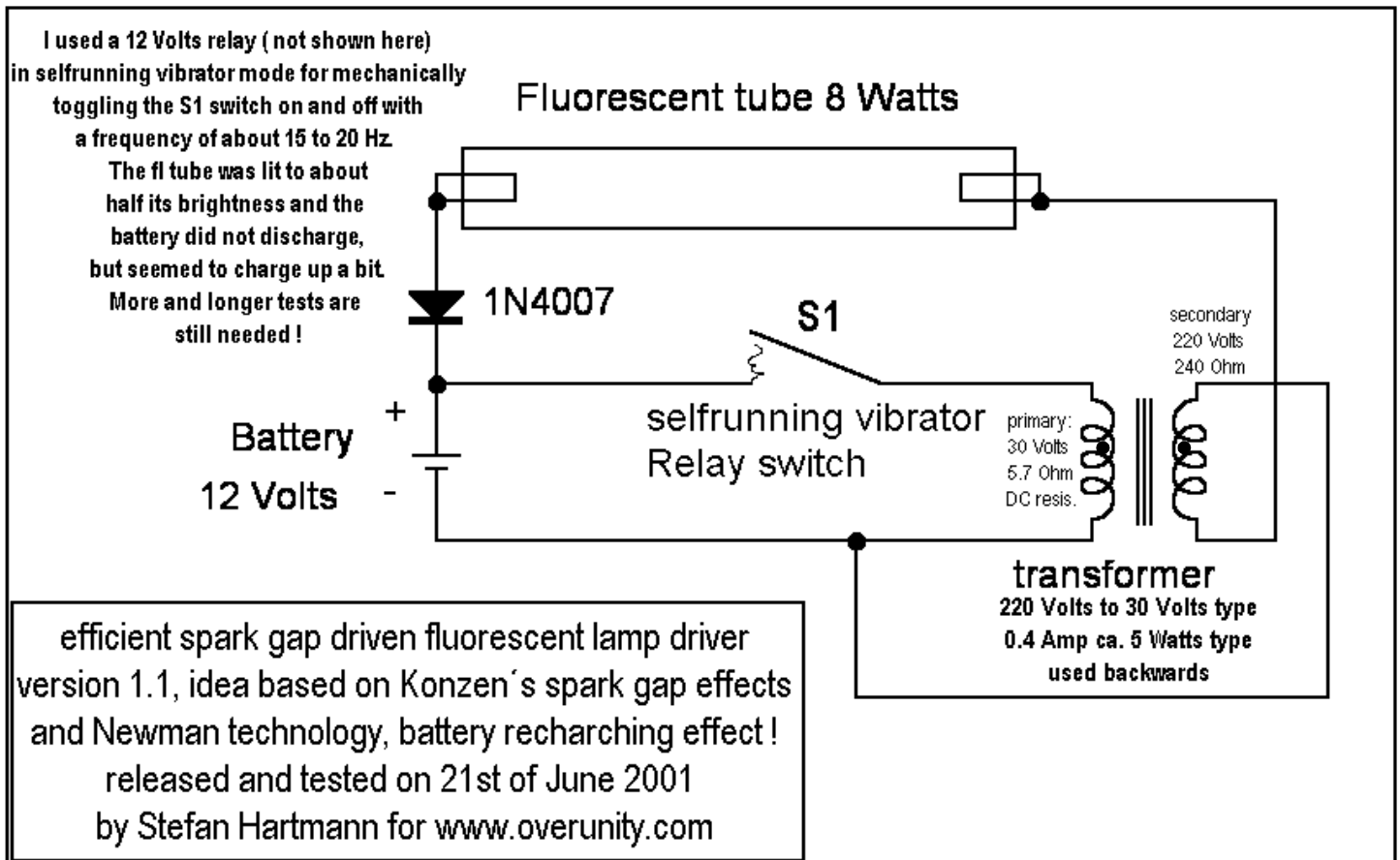
MAGNETIZATION PHASE OF CYCLE



DEMAGNETIZATION PHASE OF CYCLE

Excess electrical energy is released from the device during the demagnetization phase of a magnetization/demagnetization cycle. **As a consequence of releasing this excess electrical energy, the device transforms it from the ambient thermal environment, thereby cooling itself.**

# SHOCK CHARGING SYSTEM BY STEFAN HARTMANN



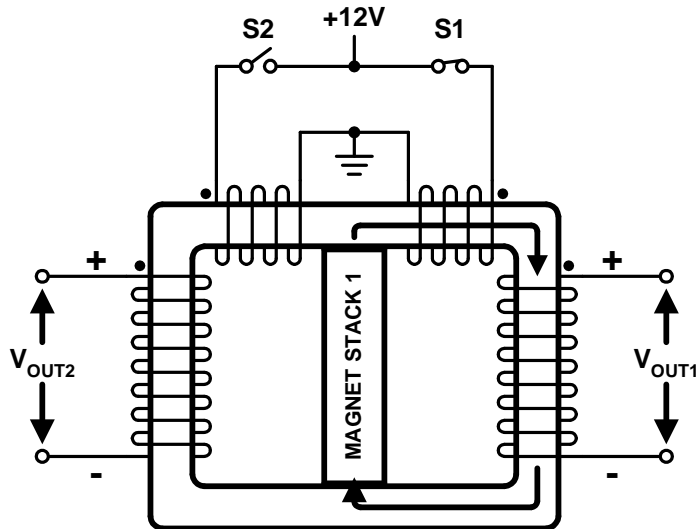
## ELECTRICAL DIAGRAM

The Shock Charging System presented by Stefan Hartmann is classified as a CATEGORY 3A Over-Unity Device. The excess electrical energy appears in the secondary coil of the transformer during the demagnetization phase of a magnetization/ demagnetization cycle.

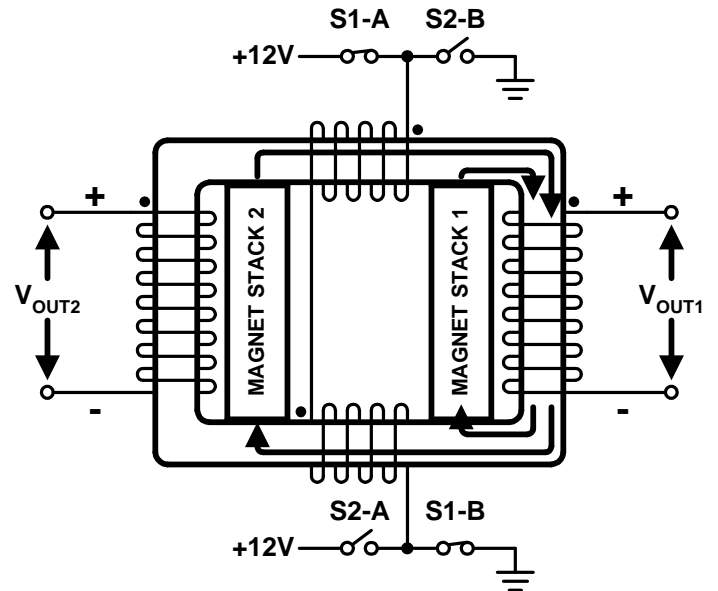
The magnetization phase of the cycle is initiated by closing switch S1. The fluroescent tube functions as current limiting resistor.

# COMPARISON BETWEEN T. BEARDEN'S MEG AND J. FLYNN'S PP

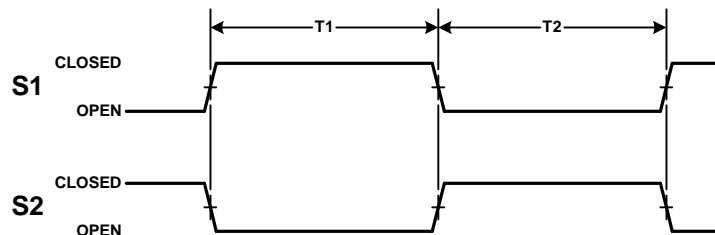
**T. BEARDEN'S MEG  
DESIGN**



**J. FLYNN'S PARALLEL  
PATH DESIGN**



**BOTH DESIGNS HAVE IDENTICAL SWITCH STATES**



**SWITCHING CHARACTERISTICS**

The Flynn design has a more efficient input switching scheme than the Bearden design.

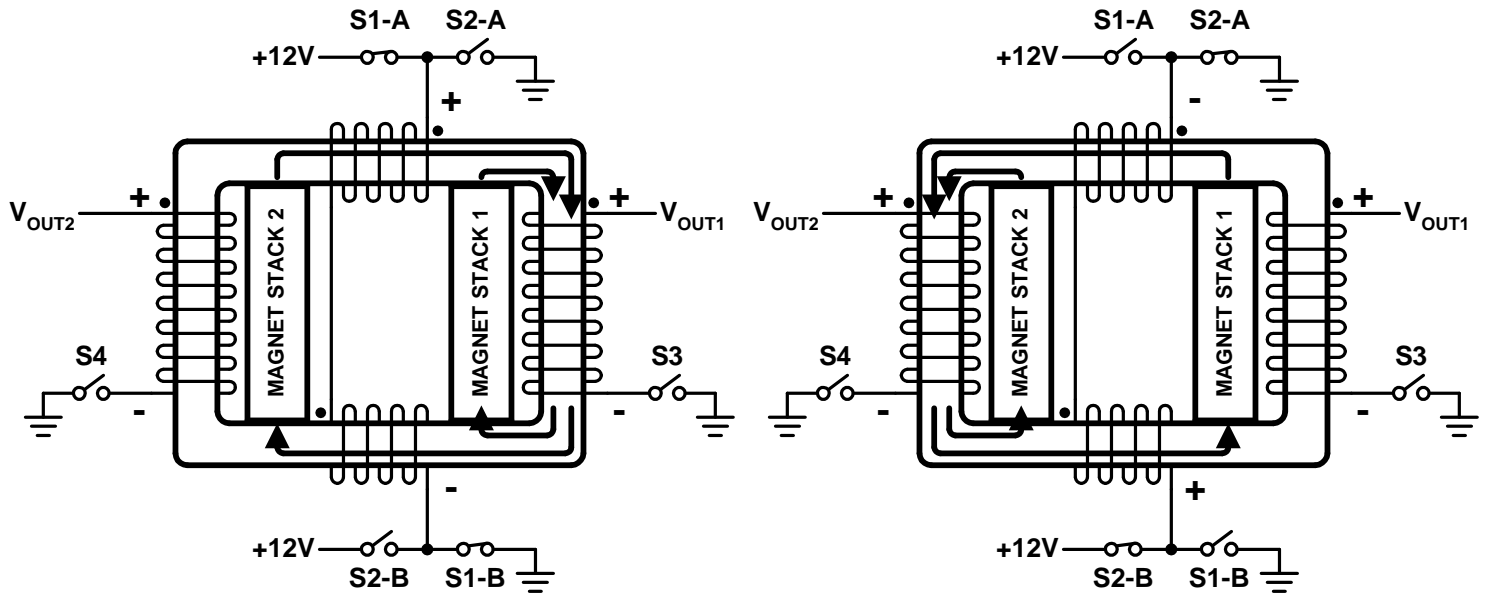
# THE SmartMEG OVER-UNITY DEVICE



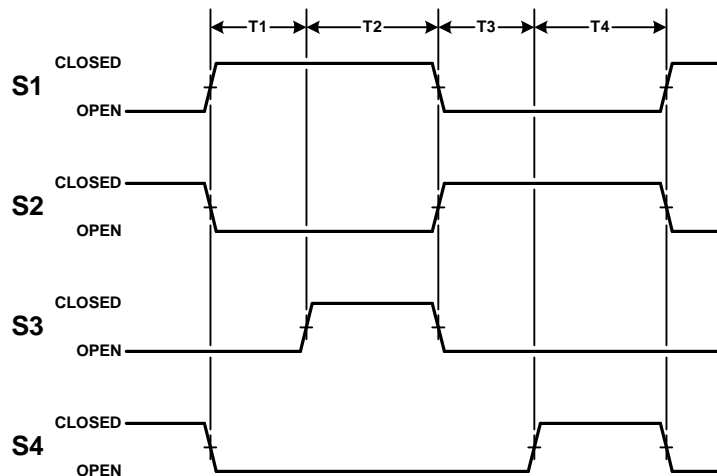
The SmartMEG is classified as a CATEGORY 3B Over-Unity Device.

The design implements the efficient Flynn input scheme. This devices uses the series-wired control coils and a double magnet stack.

# THE SmartMEG SWITCHING STATES



ELECTRICAL DIAGRAM



SWITCHING CHARACTERISTICS

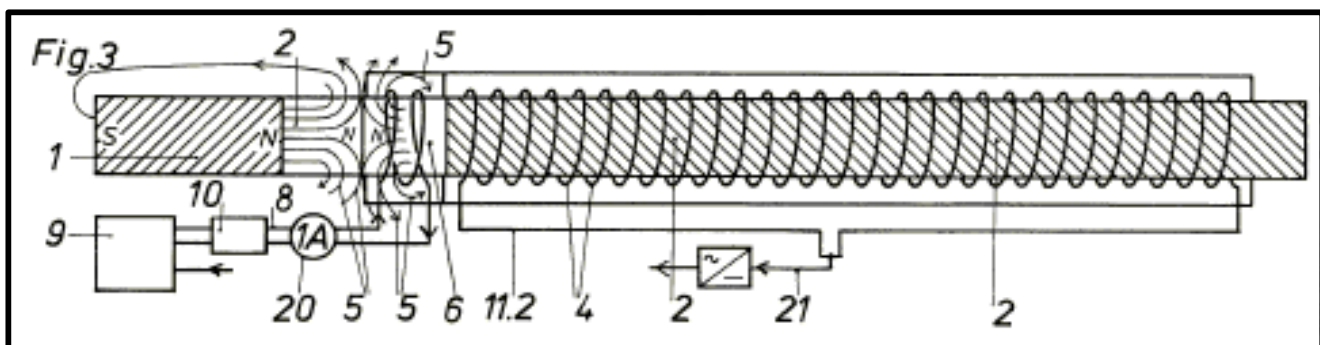
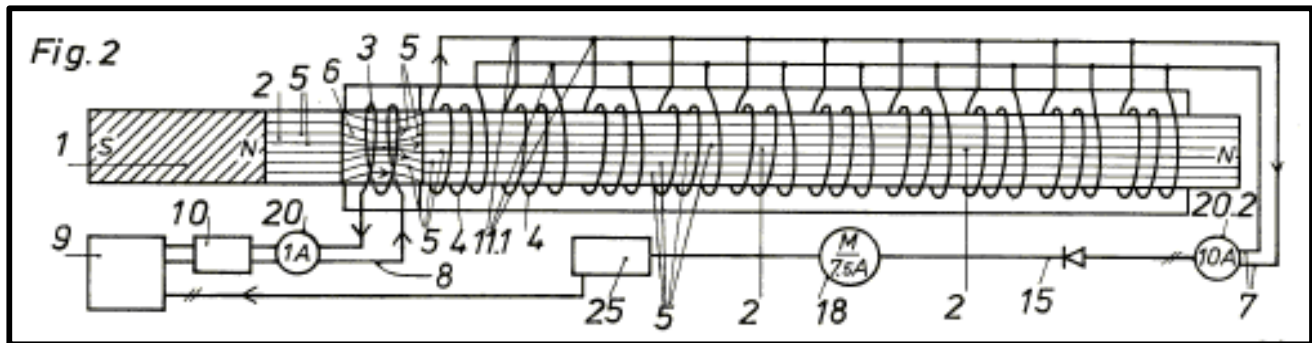
**T1 & T3 : Wait for full flux transfer.**

**T2 & T4 : Activate output switches. Collect excess energy.**

When S3 and S4 are open, the intended secondary coil has a voltage bounded by Faraday's Law to the total flux flowing through its' core. This flux is the sum total of the two magnet stacks flux and the control coils flux.



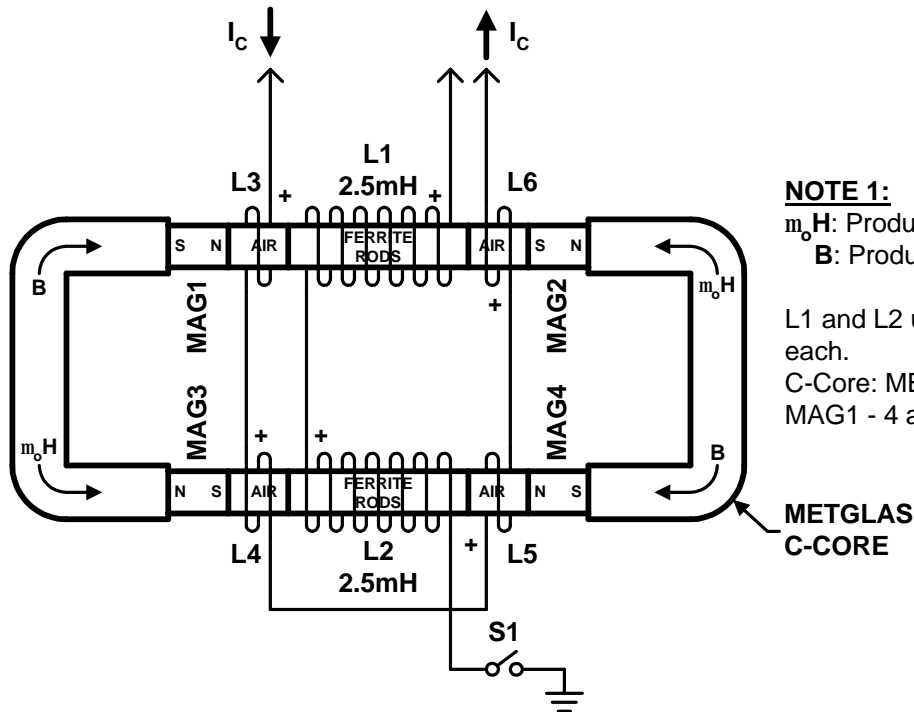
# THE Heinrich Kunel PATENT (DE3024814) January 1, 1982



The Heinrich Kunel patent is classified as a CATEGORY 3C Over-Unity Device, but NOT as shown in the patent.

The "correct" operation of this device appears to be a combination of the SmartMEG and the Adams Motor. The magnetization of the control coil cancels the field flowing through the flux gate. Then, reverse magnetization of the same causes flux from the control coil plus the flux from the magnet to magnetize the core. An output delay turn-on circuit may be required as a caveat to ensure magnet flux transport across the air gap. Excess energy can then be collected in the output coil.

# THE SmartPAK KPOD OVER-UNITY DEVICE



**NOTE 1:**

$m_oH$ : Produced by coil L1 and L2.

$B$ : Produced by magnet MAG1 - MAG4.

L1 and L2 use 50ft of 16AWG magnet wire each.

C-Core: METGLAS, AMCC-500.

MAG1 - 4 are NIB type magnets.

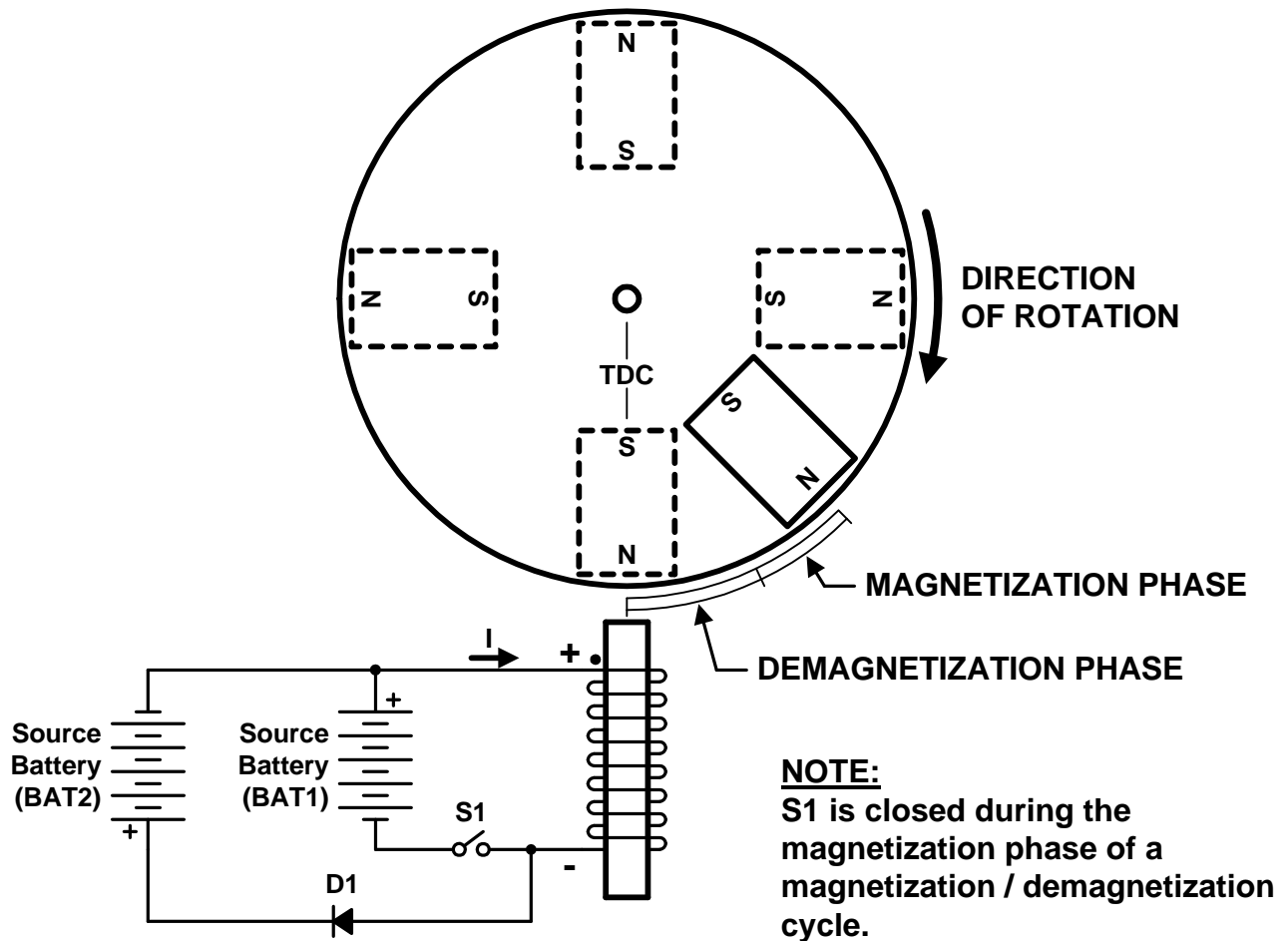
**ELECTRICAL DIAGRAM**

The SmartPAK KPOD is classified as a CATEGORY 3C Over-Unity Device.

The coils L3 - L6 are the flux control gates, and are operated bidirectionally (AC). The actual operation is very similar to the Flynn input design. Output delay turn-on is provided by switch S1. This will ensure the magnet flux is transported across the air gap.

Excess energy is collected in output coils L1 and L2.

# THE Adams MOTOR



**ELECTRICAL DIAGRAM**

The Adams Motor is classified as a CATEGORY 3C Over-Unity Device.

As the magnet approaches Top-Dead-Center (TDC), maximum influence of the magnet flux with the coil/core demagnetization phase is obtained. Hence, the coil/core demagnetization energy is greater than the magnetization energy.

As the magnet moves past TDC, the influence of its flux with the coil/core decreases.

# **FUTURE RESEARCH**

## **GRAVITONICS**

Is a scientific discipline that investigates ferromagnetic-based methods and devices that control or influence gravity.

The latest Russian research shows a correlation between magnetostriction and gravity.

Develop the Gravito-Ferromagnetic Space Drive.

## **THERMOFERROMAGNETICS**

Is a scientific discipline that investigates ferromagnetic-based methods and devices that control or influence the ambient thermal environment.

The latest Russian research shows a correlation between magnetostriction and the ambient thermal environment.

# REFERENCES

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17. H. Aspden and R. Adams, "Electrical Motor-Generator", GB2282708, Sept. 30, 1993.
18. T. Bearden and co., "Motionless Electromagnetic Generator", US Patent 6,362,718, Mar. 26, 2002.
19. C. Flynn, "Methods for Controlling the Path of Magnetic Flux from a Permanent Magnet and Devices Incorporating the Same", US Patent 6,246,561, June 12, 2001.
20. Tim Harwood's Over-Unity CD Motor, <http://www.geocities.com/theadamsmotor/cdmotor.html>.