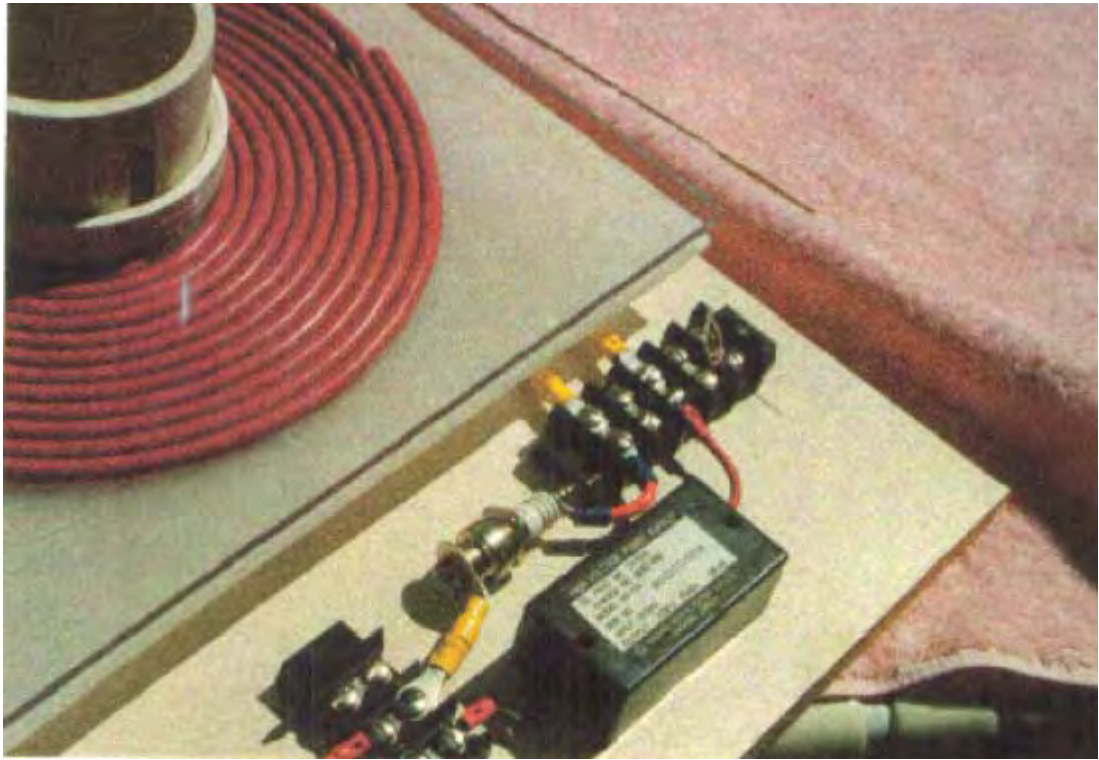


RESONANCE ENERGY METHODS

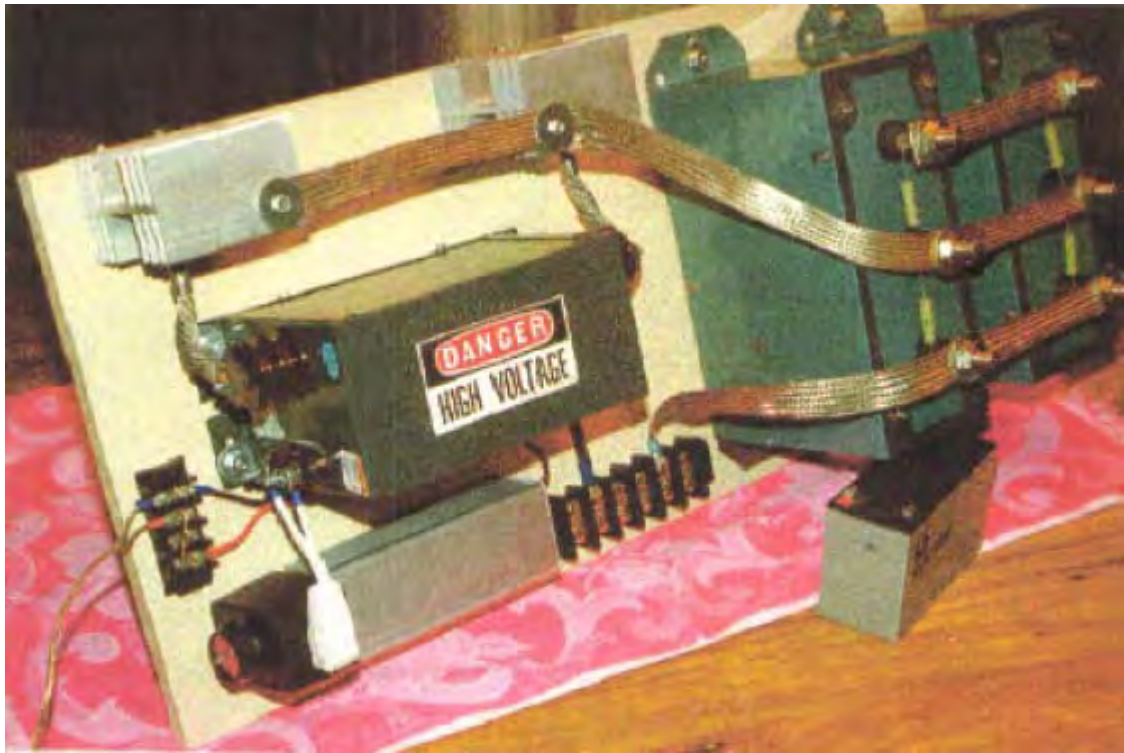
Donald L. Smith
TransWorld Energy, CEO
September 23, 2002

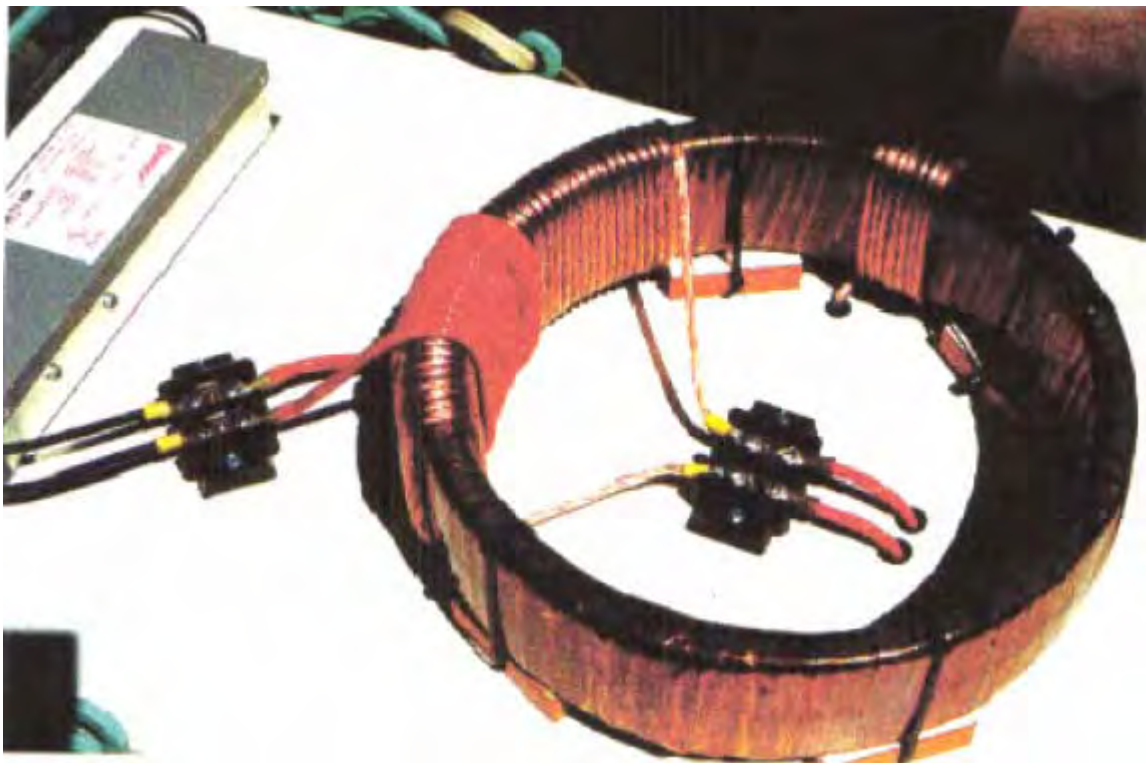
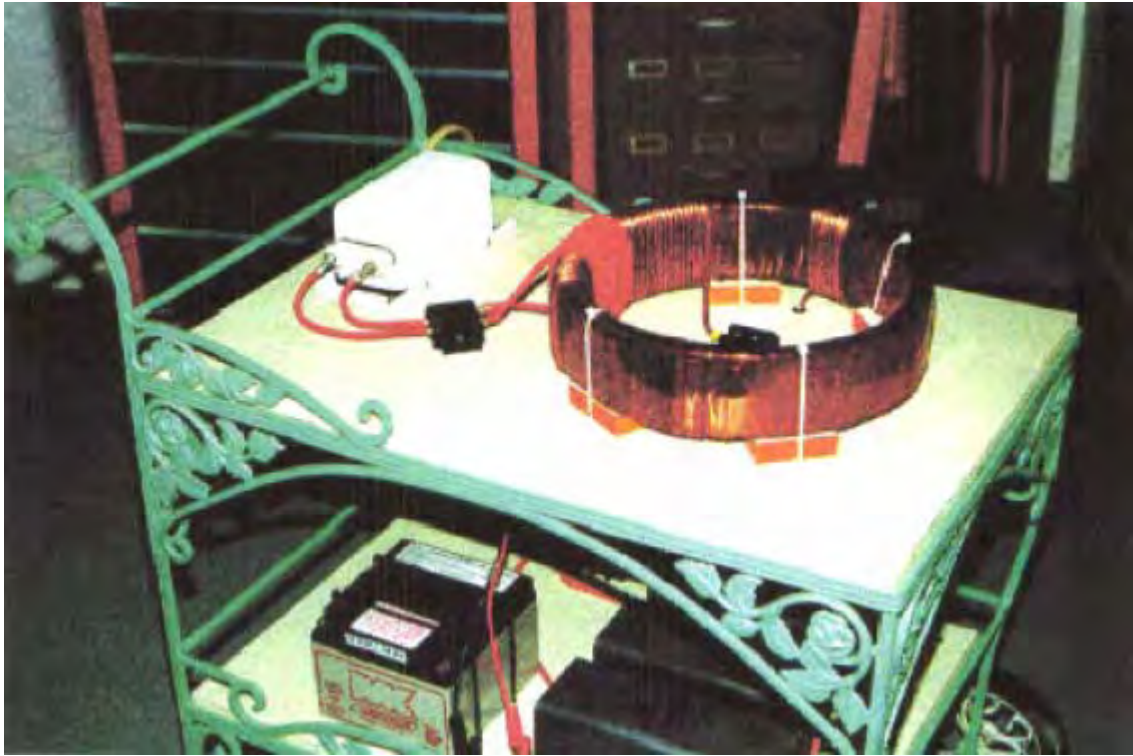
Fax/Phone 281-370-4547 and e-mail donsm1@earthlink.net

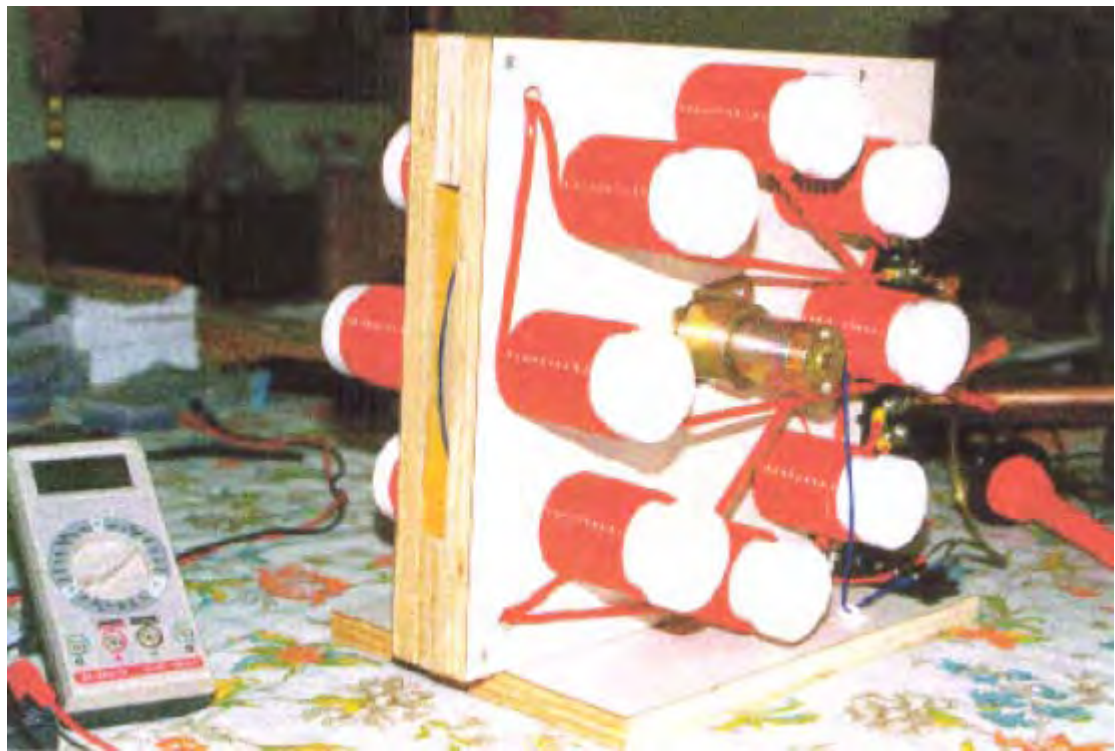
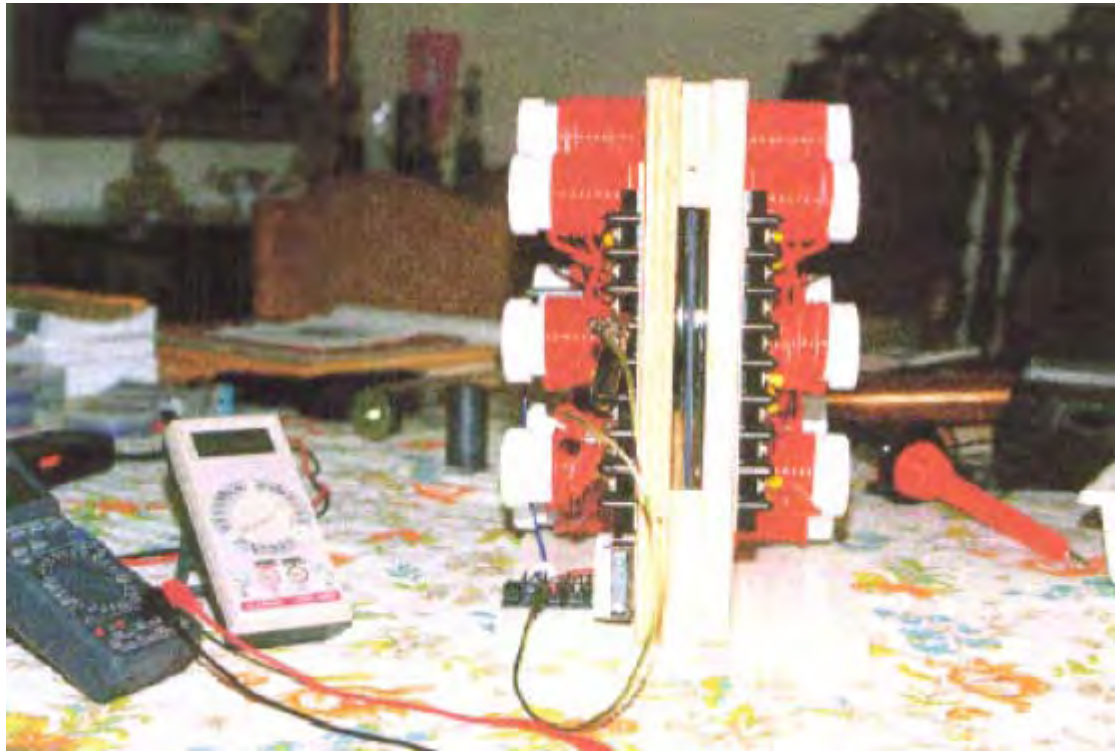


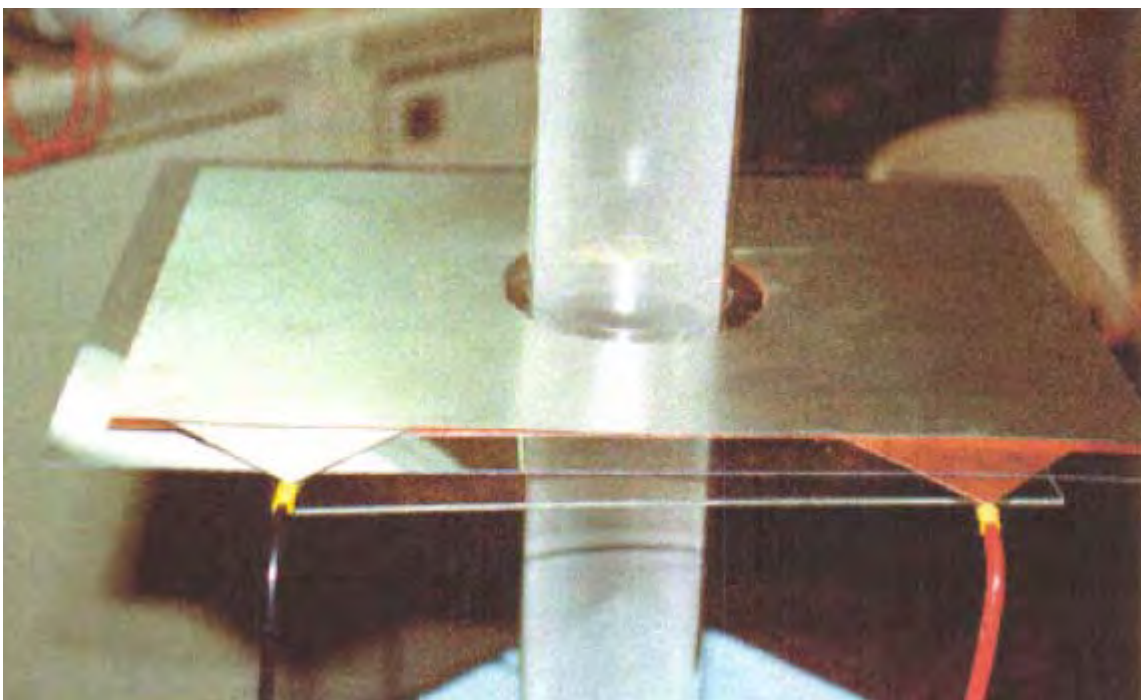
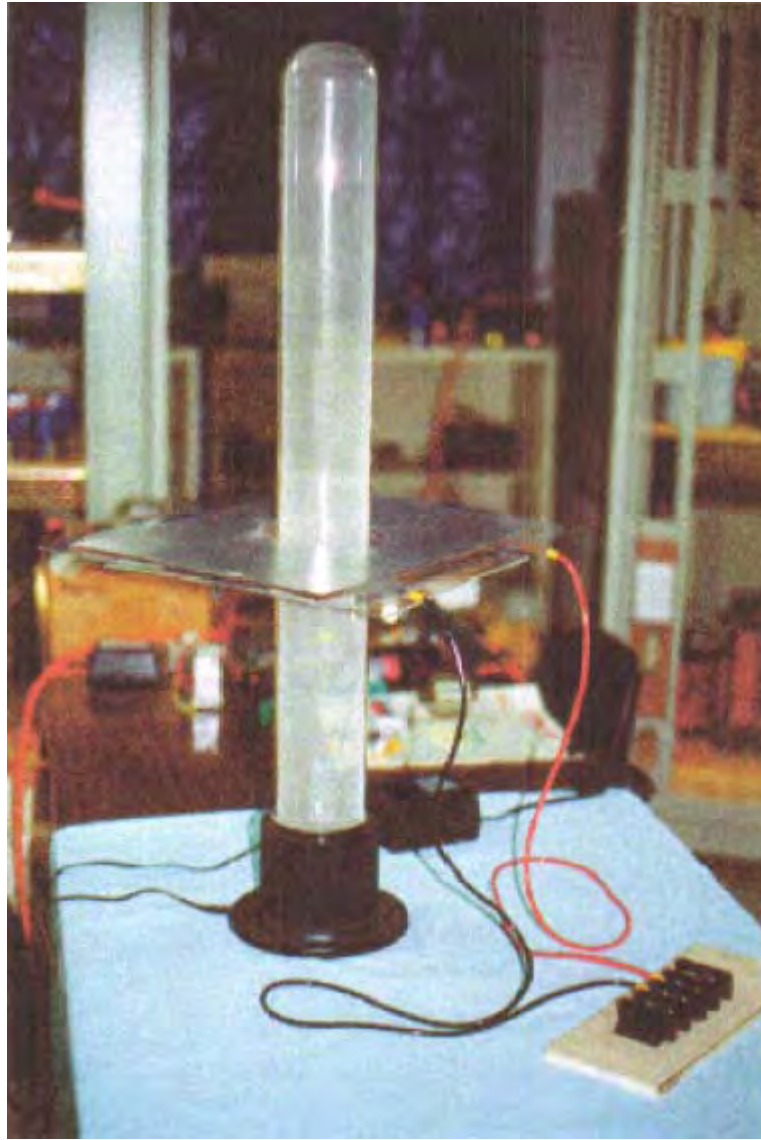


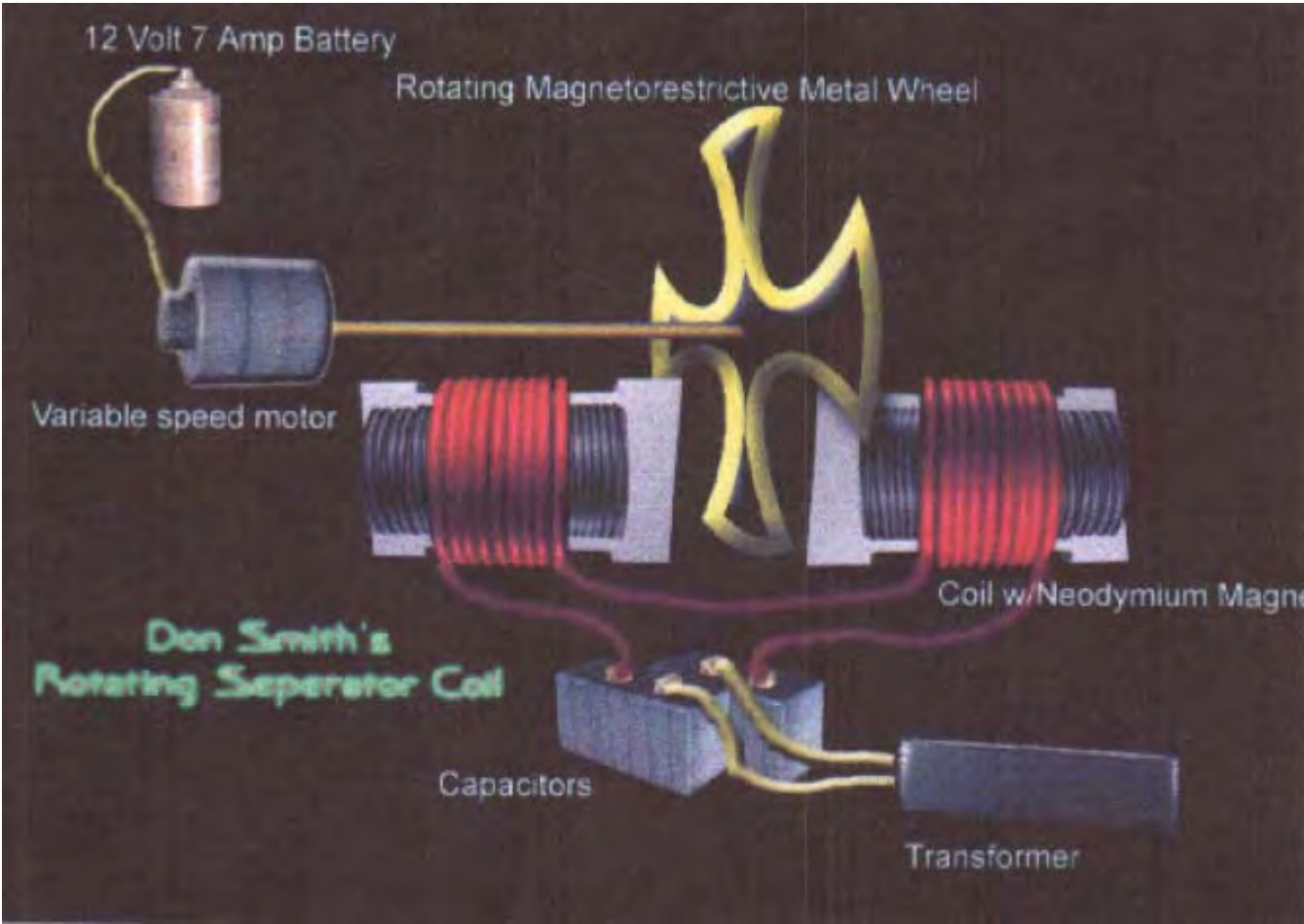












DIPOLE TRANSFORMER GENERATOR DESCRIPTION

TECHNICAL FIELD:

The Invention relates to loaded Dipole Antenna Systems and their Electromagnetic radiation. When used as a transformer with an appropriate energy collector system it becomes a transformer generator. The invention collects and converts energy which, with conventional devices, is radiated and wasted.

BACKGROUND ART:

An International search of Patent Databases for closely related methods did not reveal any prior Art with an Interest in conserving radiated and wasted magnetic waves as useful energy.

DISCLOSURE OF INVENTION:

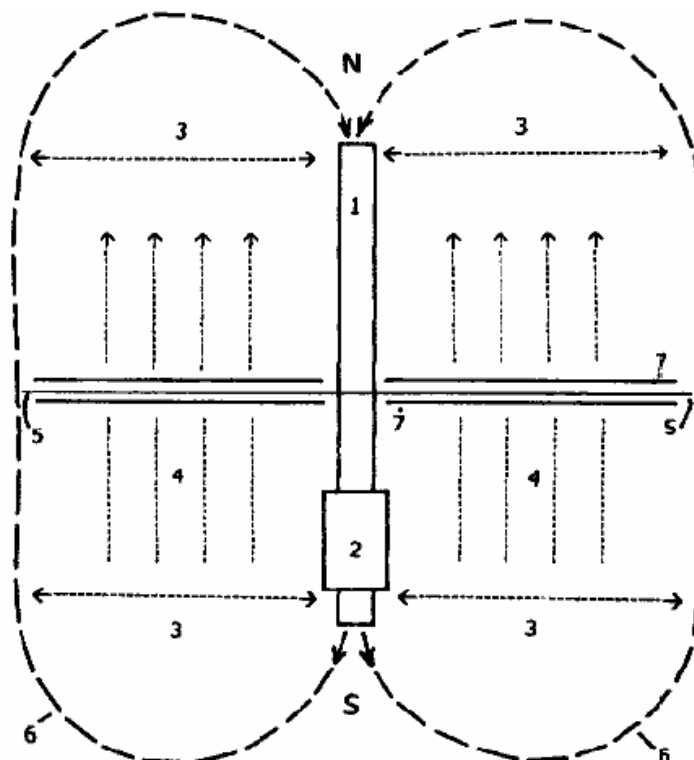
The Invention is a new and useful departure from transformer generator construction, such that radiated and wasted magnetic energy changes into useful electrical energy. Gauss Meters show that much energy from conventional electromagnetic devices is radiated back into the ambient background and wasted. In the case of conventional transformer generators, a radical change in the physical construction, allows better access to the energy available. It is found that creating a dipole and Inserting capacitor plates at right angle to the current flow, allows magnetic waves to change back to useful electrical (coulombs) energy. Magnetic waves passing through the capacitor plates do not degrade and the full impact of the available energy is accessed. One, or many sets of capacitor plates, may be used as desired. Each set of plates makes an exact copy of the full force and effect of the energy present in the magnetic waves. The originating source is not depleted or degraded as is common in conventional transformers.

BRIEF DESCRIPTION OF THE DRAWINGS:

The Dipole at right angle allows the magnetic flux surrounding it to intercept the capacitor plate, or plates, at right angles. The electrons present are spun in such a way that the electrical component of the electrons is collected by the capacitor plates. Essential parts are the South and North component of an active Dipole. Examples presented here, exist as fully functional prototypes, and were engineer constructed and fully tested for utility by the Inventor. Corresponding parts are utilized in each of the three examples as shown in the Drawings.

DRAWING 1 OF 4: VIEW OF THE METHOD

N = North and S = South of the Dipole



1. North and South component of the Dipole.
2. Resonate High Voltage induction coil.
3. Dipole's electromagnetic wave emission.
4. Heaviside current component.
5. Dielectric separator for the capacitor plates
6. For purposes of the drawing, a virtual limit of the electromagnetic wave energy.
7. Capacitor plates, with dielectric in between.

DRAWING 2 OF 4: COMPONENTS, 2A and 2B

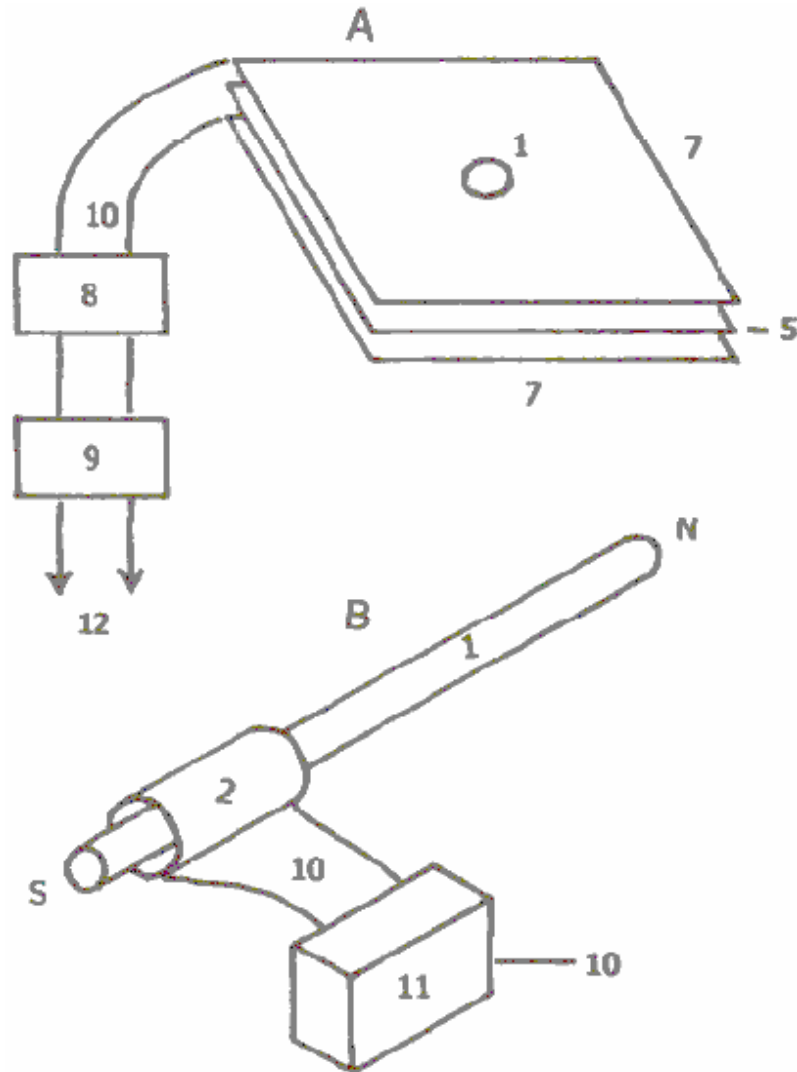


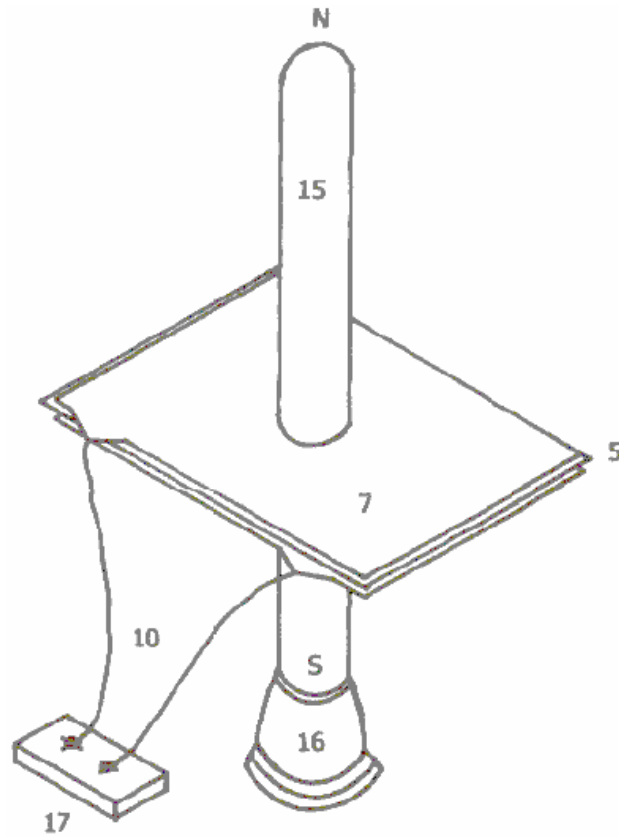
Fig.2-A:

1. Hole for mounting Dipole B-1.
2. Resonate high voltage induction coil.
5. Dielectric separator, a thin sheet of plastic separating the capacitor plates.
7. Capacitor plates, upper plate is aluminum and lower plate is copper.
8. Battery system, deep cycle.
9. Inverter. Input: Direct Current, output: 120 Volts at 60 cycles per second.
10. Connector wires.
12. Output to point of use being the load.

Fig.2-B N = North and S = South component of the Dipole

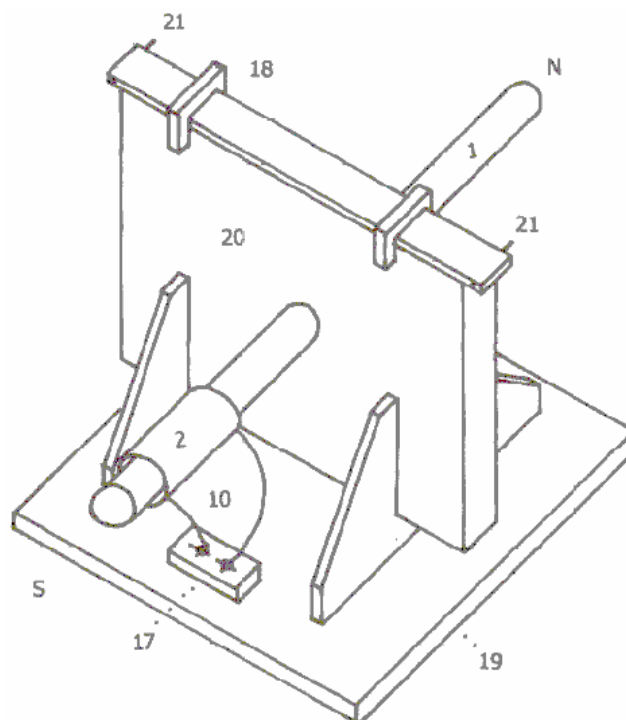
1. Metal rod, being soft magnetic metal such as iron.
2. Resonate high voltage induction coil.
10. Connector wires.
11. High Voltage input energy source such as a neon tube transformer.

DRAWING 3 OF 4 : Proof of Principle Device, using a Plasma Tube as an active Dipole.
N = North and S = South Components of the active Dipole.



- 5. Dielectric separator of the capacitor plates.
- 7. Upper capacitor plate: upper plate is aluminum and lower plate is copper.
- 10. Connector wires.
- 15. Plasma Tube, 4 feet long and 6 inches in diameter.
- 16. High Voltage Energy source for the active Plasma Dipole.
- 17. Connector block: outlet for testing and use.

DRAWING 4 OF 4: Manufactures Prototype, Constructed and fully tested.



1. Metal Dipole rod.
2. Resonate High Voltage induction coil.
10. Connector wires.
17. Connector block for Input from high voltage energy source.
18. Clamps for upper edge of capacitor packet.
19. Support Device for The Dipole Transformer Generator.
20. Packet of Capacitor Plates.
21. Output connectors of the capacitor, producing energy into a deep cycle battery which then powers the inverter.

BEST METHOD OF CARRYING OUT THE INVENTION:

The Invention is applicable to any and all electrical energy requirements. The small size and high efficiency makes It an attractive option. It is particularly attractive for remote areas, homes, office buildings, factories, shopping centers, public places, transportation, water systems, electric trains, boats, ships and all things small or great Construction materials are readily available and the skill level required is moderate.

CLAIMS:

1. Radiated magnetic flux from the Dipole, when intercepted by capacitor plates at right angles, changes to useful electrical energy.
2. A Device and method for converting for use, normally wasted electromagnetic energy.
3. The Dipole of the Invention is any resonating substance such as Metal Rods, Coils and Plasma Tubes which have interacting Positive and Negative Components.
4. The Resulting Heaviside current component Is changed to useful electrical energy.

ABSTRACT

An Electromagnetic Dipole Device and Method, wherein, radiated and wasted energy is transformed into useful energy. A Dipole as seen in Antenna Systems is adapted for use with capacitor plates such that the Heaviside Current Component becomes a useful source of electrical energy.

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September 23.2002

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Dear Reader:

TransWorld Energy is dedicated to improving the Human Condition in the Field of Energy which, at the same time, makes possible Healthy Water and increases the food Supply. A never-ending source of energy found throughout the universe is easily accessed with the minimum of effort and cost. The technology for doing this has been around since the 1820s. Selfish special interests have made sure that the technology remains discredited. People who control the Energy Sources control the World.

Extensive research and development by TransWorld and Associates has been progressing for more than 15 years. Numerous successful Energy Producing Devices have been produced and demonstrated throughout the World. Some of these can be viewed by the Web Site located using any major search engine (such as Lycos, Yahoo, Altavista, NorthenLight and more than 2,000 others throughout the World).

The Book which You are viewing has more than 40,000 copies in circulation. It has been translated and distributed in all major languages including Japanese, Arabic, Portuguese, French, Italian, Russian, Chinese, German, Spanish and many more. There are seven editions in circulation. An enormous interest is evident in the subject matter. An average of about fifty e-mails per day are received from the ends of the Earth (that is about 1,500 per month).

Once the Web Site and the book are viewed, it will become evident that abundant, self-sustainable energy is available everywhere for the taking. This is natural energy which does not harm the environment or those using it. The proper Device for Collecting is all that's required.

The Good News is that the problem is solved and with assistance, an ultimate source of energy which is environmentally benign, abundant throughout the universe and inexpensive to capture, is there for the taking.

Thank You for your consideration

Donald L. Smith, CEO

The logo consists of the letters 'M', 'E', and 'M' in a bold, sans-serif font, each letter contained within its own rectangular box. These three boxes are arranged horizontally and are themselves contained within a larger, slightly wider rectangular frame.

Electrical Energy Generating System

Description and Function:

The Generation of Electrical Power requires the presence of electrons with various methods of stimulation, yielding magnetic and electrical impulses, collectively resulting in Electrical Energy (Power). In place of the mechanical - coils and magnet system, present in conventional electrical power generation, visible moving parts are replaced by resonate magnetic induction, using radio frequency. Transfer of energy by resonate induction is related to the ratio of the square of the cycles per second.

The Energy System, presented here, operates at millions of cycles per second verses the conventional 60 C.P.S. This tells us that it has a frequency advantage over conventional methods. This same advantage applies to the amount of electrical energy output. Therefore the Device is small in size and produces large amounts of Electrical Energy. The Electrons acquired, are from the surrounding Air and Earth Groundings, being the same source as in conventional methods. This is accomplished by magnetic resonate radio induction.

Applications:

This Electrical System adapts nicely to all Energy Requirements. It is a direct replacement for all existing Energy Systems. This includes such things as Manufacturing, Agricultural, Home Usage, Office Complexes, Shopping Centers, Rail Transportation, Automobiles, Electrical Power Grids, Municipalities, Subdivisions, and Remote Areas. Briefly, the only limiting factor is the imagination.

Economic Possibilities:

No Historical Reference Point exists for a comparison of the Possibilities of this System. One can see from the impacted applications listed above, that the magnitude exceeds any known invention, presently a part of the Human Experience.

Present and Future Plans:

The Energy System has been in the developmental stage during the past seven years. It is Patent Pending # 08/100,074 with the Patent Office. No prior art exists according to the Patent Office's response. The System is presently being introduced into the World Market.

Useful energy occurs as the result of imbalances in the ambient background energy, which is a transient phenomena. In the electrical field, it is a closed system subject to heat death, which severely limits it's utility. The flip side of the electron, produces magnetic waves which are an open system, not subject to heat death. These waves, being unrestricted, are the universal source of energy when unlimited resonate duplicates from this one source are available. Therefore, the key to unlimited energy, is Magnetic Resonance. In order to understand this, requires putting a stake through the Heart of Antique Physics. Non-linear and Open Systems are universally available in Magnetic Resonance Systems, Explosions of

any sort [including Atomic Explosions] and Combustibles of any type. Mechanical equivalents would be levers, pulleys and hydraulics. A highly obvious example is the Piano where the Key impacts the one note giving one sound level, which resonates with it's two side keys providing a much higher sound level. Magnetic Resonance Energy clearly amplifies itself, demonstrating more energy out, than in.

Ohmic resistance does not apply to Magnetic Resonance which travels unrestricted for great distances, therefore multitudes of electrons are disturbed, and their back-spin translates magnetic into usable electric energy. The right angle component which the magnetic flux provides, translates into useful electrical energy. Taken at right angles, the Magnetic Dipole provides an unlimited source of electrical energy. The writer is recognized world-wide for his knowledge and experience. See his Web Site at altenergy-pro.com .

Gravity is a function of spin phenomenon as observed in gravity separation of liquids. When spun, milk and cream separate. Therefore, relative specific gravity is function of mass versus spin. Magnetics and gravity are both spin related. In part, a top levitates when spun. Therefore, spinning magnetic fields are a functional motor source as in flying saucers.

ABSTRACT: Technology of New Energy:

Developments in the understanding of Electricity, along with Materials which were not previously available, allows the construction of Devices which collect energy in large quantities, from the Earth's Ambient Electrical Background. This Energy is naturally occurring, environmentally benign and is available everywhere. It is available wherever and whenever it is required. New Devices use Resonate Magnetic Waves which replicate upon spinning the locally present electrons, providing multiple duplicate copies of the Energy Present. Each electron when spun yields both magnetic and electric waves in equal proportion. The electrical component is a closed system limited by Ohms Law. The magnetic component is an open system not limited and it replicates multiple copies of the energy present.

Special materials and recent developments allow the magnetic energy to reproduce, through resonance, unlimited duplicate copies acquired from the ambient background. These Devices harvest the energy that has been, and is always present universally. Conventional methods consist of coils and magnets systems. Upon moving past each other, the magnetic flux field disturbs electrons which yield electricity, which is collected by the coils system. This is accomplished electronically with the new technology, without any moving parts and the energy is multiplied such that the Device becomes self-sustaining once it is started. This Technology, already presented Worldwide, will be shown at the Conference.

Dr. Smith

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"Putting a stake through the Heart" and thus removing the mental block created by antique physics is required. Conditions wherein this becomes necessary are non-linearity, resonance and explosions of any sort. Combustibles of any sort such as gasoline and atomic explosions are good examples wherein more energy out than in, is obvious. You can add to that the non-linearity found in pulleys, hydraulics, steam power and suchlike. Magnetic resonance is a highly obvious source for multiplying energy output. The sound system present in the piano, demonstrates this very clearly. Energy amplification clearly present in the above, demonstrates the silliness attested to by many Physicists.

Ohmic resistance does not apply to magnetic resonance which travels unrestricted for great distances, therefore multitudes of electrons are disturbed, and their back-spin converts from magnetic energy to usable electric energy. These same electrons have been around from the beginning of time and they are undiminished and will remain so until the end of time.

ELECTRICAL ENERGY SYSTEMS PREFACE

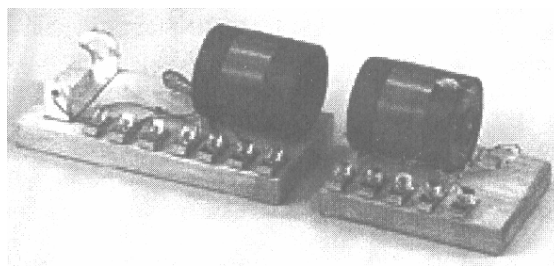
Useful Electrical Energy is obtained directly from electron spin induced by incoming magnetic waves, or indirectly through mechanical exchange as in dynamo type devices. Simply put, electron spin converts from magnetic to electrical energy and vice versa. Nature provides grand scale magnetic wave induction throughout the universe, for free. In Electrical Systems, movement is at right angles to the direction of current movement. This explains the rotary movement of the Earth and other related Systems. The rate of Spin for the Earth is known as well as the mass (5.98×10^{24} Kg - "Physics for Scientist and Engineers", by Raymond A. Serway, Saunders College Publishing, 2nd Ed. page 288, Table 14.2), therefore the amount of incoming Electrical Energy which produces this action can be calculated.

It can be seen quite easily, that the incoming magnetic wave energy is Vast and Continuous. As an accretion mass, the Earth is an Energy Sink, getting it's energy from elsewhere, being Cosmic, Galactic and Solar. Conversion of incoming magnetic waves into electrical energy provides an unending, inexpensive and environmentally friendly source available to all. Cosmic and Galactic Energy is available twenty four hours per day. Large amounts of this Energy accumulates in the Earth's radiation belts. This Giant Energy Storage, when properly understood, provides a major source of free unending electrical energy. Each of My Inventions plugs into this vast energy source.

A perverse, Intentional Ignorance on the part of the Establishment, prevents recognition of the importance of the Energy Systems shown here. Any new system which is favorable towards the masses, is considered as disruptive, and therefore not allowed. Those who have the (Gold) Energy Rule (Golden rule) Mandated Destruction of all Humanity is not a consideration.

This Presenter will remove some of the Fog placed with the intention of preventing the recognition of this unending, environmentally clean, electrical energy Source, which is present everywhere throughout the Universe. The Cost of Harvesting and Using this Free Energy is a function of Human Stupidity.

RESONANCE CIRCUITS DEMO



Used to demonstrate electromagnetic radiation between two UC circuits - one a transmitter and the other a receiver. When the 1.5 volt power transmitter is pulsed, the radiated signal is picked up by the remote receiver circuit which then lights up a 70 volt neon lamp.

With this apparatus, the student quickly understands some basic principles governing wireless communication, broadcasting, etc.

Kit: #10-416

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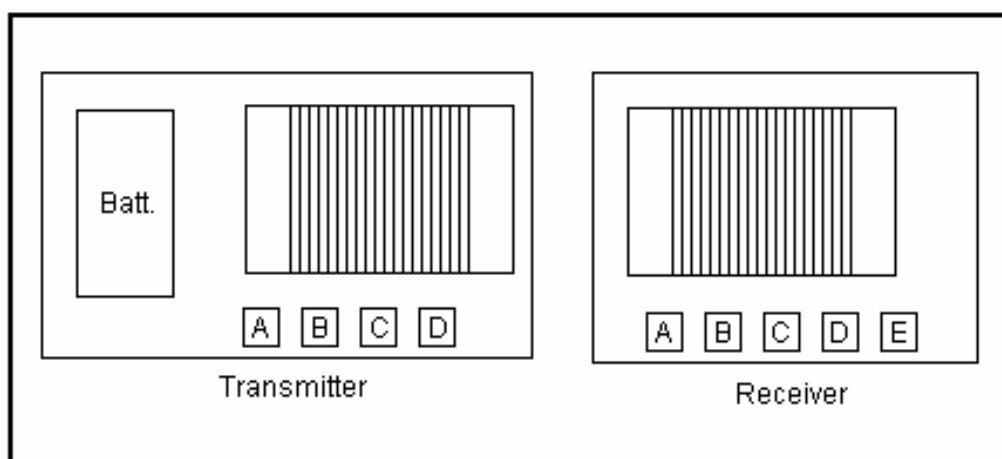


Diagram of transmitter and receiver coils

ULTIMATE ENERGY SOURCES

A human is a speck of dust on Earth, the Solar System is a speck of dust in the Galaxy and in turn, the Galaxy is a speck of dust in the Universe (Cosmos). All of these respectively represent vast ambient energy reservoirs. Awareness of the Sun, opens doors into other energy sources. Electromagnetic Energy which is present everywhere throughout the Universe, is accessed by catalytic activity, directly as in Solar Cells or indirectly as by mechanical means. Resonate, Magnetic Waves (Faraday's "Action at a Distance") allow Energy Activation Transfer to remote points of usage. The method of capture and use of this Energy is optional, and therefore it's cost is a function of Human Stupidity (Free-Energy).

Direct access is more desirable, and technology transfer from Solar Cell-type Devices provides the Catalyst. Enormously high Ambient Energy Levels are not detected by instruments that use the Ambient Background as a Reference Plane. A spoonful of water lifted from the Ocean does not define the Ocean. Incoming magnetic waves are reflected, Deflected or absorbed. Deflected Magnetic Waves spin electrons sideways producing useful Electrical Energy. Absorbed Wave Energy produces heat, therefore a hot interior for the Earth. In Electrical Systems physical movement is in the direction of current flow, frictional drag from inflow current defines gravity. Accretion masses resulting from Energy Sinks, provide all solid entities with their respective gravitational effect.

Increasing the tolerance level for Intellectual Awakening opens Doors of Reality. These doors blink into, and out of existence, and upon recognition, benefit Mankind. Opening some of these Doors, which at the present time are seen through a deep fog, is our purpose. Exploring Unrecognized Energy Sources, which are a Part of the Ambient Background, is another goal. Our Available Instruments do not use reference planes which allow recognition of this energy, as we shall see, vast Energy Sources that totally surround us are available through Technology Transfer. They are inexpensive (Free), fully self-renewable and environmentally benign.

Incoming Magnetic Wave Energy with Faraday's "action at a distance" will be looked at closely. Particle Physics will be left for the Astrophysics. Excited Electrons at point "A" the Sun (including the Galaxy and Cosmos) do not travel to point "B" the Earth, however a corresponding action occurs at point "B". The Electrons being disturbed at the Central Power Plant, in the same manner excite the Electrons at Your House, upon switching into an Earth grounding (known as "flipping the switch"). Correspondingly, there are Four Major Power Sources providing enormous amounts of Ambient Background Magnetic Wave Energy. They are The Cosmic, Galactic, Solar and Earth's Ambient Electromagnetic Backgrounds. The Earth's Electromagnetic Field comes from reflection, deflection and absorption as a result of action at a distance from the above.

Prescription Physics mandates that the Earth's background is of little interest. When we have Considered the evidence herein, it will become obvious that Special Interest's effort at keeping the People ignorant has, until now, largely succeeded.

Information for the entire World is available regarding the Magnetic Flux Background of the Earth's Surface (United State's Geological Survey, Colorado, USA, Office). When examined and properly understood, these Maps yield important information regarding reflection, deflection and absorption of incoming Magnetic Waves, plus action at a distance. When properly understood, these Maps reveal a very large Ambient Electromagnetic Energy Source. This is the Part of the Earth's Energy System that relates to the Bird on the High Voltage Line. When deflected, magnetic flux from electrons changes to electrical flux, providing the Motor System that spins or rotates the Earth. Physical movement by electrical systems is from inflow current movement. What level of current movement is required to spin the Earth? The Earth's Mass is 5.98×10^{24} . From this Information, the Watts of Electricity Required may be calculated! Absorbed microwave flux energy heats from the inside out, therefore a hot interior of the Earth results. Water is strongly diamagnetic, and on windless days, ocean waves provide visible Proof of the overhead incoming magnetic flux. From the information above, the Earth's weight and rate

of spin allows the calculation of the amount of incoming ambient background energy required. As You can see, it is not inconsequential as Prescription Physics mandates.

Astrophysicist are concerned with charged particles that whiz by, once every one hundred years, rather than Wave Phenomenon associated with action at a distance. This highly Active Wave Energy translates into Electrical Energy at point "B". The Galaxy is alive With Energy which is billions of times greater than that of the Sun. Visible Light is a very tiny part of the Electromagnetic Energy Spectrum. Frequencies present in the Galaxy and Cosmos allow Radio Telescope photographs of their existence and magnitude. One such 408 MHz photograph of the Electromagnetic Energy Spectrum shows that the Earth is a tiny speck of dust in this Enormous Ocean of Energy, and can be seen near the left end of the Central High Energy Area.

This Energy extends in all directions. Accretion and formation of Planets, Suns and Galaxies are results of energy sinks and variable sized black holes. Mass retains heat, and is cooked from the inside out by the microwave background energy provided by the Universe. Flux movement into energy sinks, provides the frictional force know as gravity. Spinning mass in the presence of incoming flux amplifies the gravitational effect.

At present, only Solar Energy is recognized. It is inconsistent, flaky and a very small Part of the Magnetic Wave Energy Present. Technology Transfer from Solar Power provides uncomplicated and inexpensive, direct access to the Other Greater Energy Sources. All Electromagnetic Energy harvesting methods include a Catalyst, a Collector and a Pump. Catalysts include sensitization through doping with certain elements, air and earth groundings. Collectors include temporary storage as in Capacitors, Coils and Transformers. The Pump System includes induced movement onward to the point of use. Conventional rotating coils and magnet systems activate electrons present, such that action at a distance can occur, therefore it is an energy activation pump. In Direct Access Systems such as Solar Cells, the same occurs without mechanical action. Direct access occurs when Magnetic Waves impact a catalyst, spinning the local electrons sideways, producing useful electrical energy.

Indirect acquisition of electrical energy by mechanical means is wasteful, troublesome, expensive and degrades the environment. The dynamo is a combination collector and pump of energy which is collected from the Earth's Ambient Energy Background. Generators do not. make electricity, they collect it from the Ambient Background and forward it, as in Faraday's "action at a distance". Energy Conservation Laws relating to these systems, relate to gray areas, and when understood, are excluded because of the existence of External forces, open and non-linear systems as per Einstein. The Knowledge Base just viewed, provides a Direct Understanding of the Requirements for Harvesting of unending, fully renewable, environmentally benign Sources of Electrical Energy.

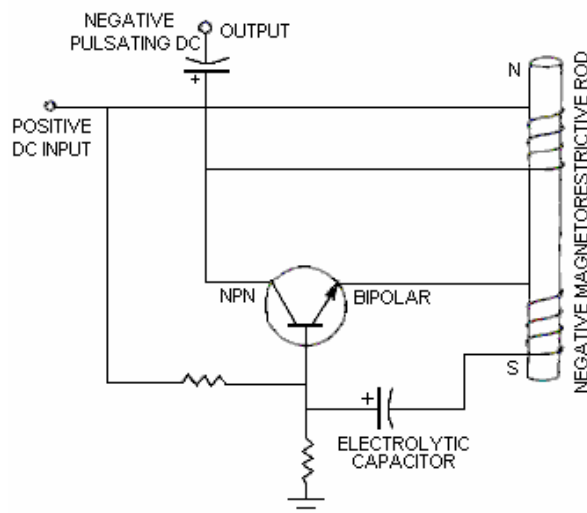
Magnetic Resonance Power System Suggestions for Construction

This is the Basic Sonar Power System which permits submarines to see approximately 50 miles distance. What is not commonly known is that it works better at higher frequencies in the Gigahertz range. Any Device that can radiate 50 miles plus, is producing an enormous electromagnetic disturbance from a small input into a rod of magnetostrictive material. Disturbing the Earth's Ambient Background plus the strong dipole being produced, turns the magnetostrictive rod into a combination of a receiving antenna and a vastly superior output transformer.

The Drawing is only the Key Unit. A power input module and an output inverter circuit (diode bridge plus output transformer) are also required. The metal core and the wire size of the output transformer, plus adjusting the Earth Grounding of the Load, will determine the Amperage.

The Ideal rod material is Terfenol-D (check the internet). However a 1.5" diameter 10" long rod, costs over \$5,000 each. Less expensive alternatives are obvious. When constructing, use PVC tubing with removable caps. Wind the coils on it and insert the experimental rod. Use only magnetostrictive material. When you get it right, you will have exactly what the Doctor ordered:

**Magnetic Resonance Power System for Water Systems
Donald L. Smith**



Magnetostriction oscillators work by magnetic resonance in a rod of magnetostriction material. This rod serves two purposes: It vibrates at the frequency of resonance oscillation, and it becomes the feedback transformer. Frequency is determined by items 4, 5, 6 and 8. The diameter, length and volume of the rod and output windings, determines the output. Item 2 provides feedback into the system. The negative magnetic character of item 8 plus the windings 2, in reaction to the magnetic flux field provided by 9, increases (amplifies or magnifies) the output. Magnetic permeability is the counterpart of negative resistance. Resonating with negative magnetic resistance, it pumps energy from the Earth's ambient background. Magnetic permeability is the ratio of flux density (Earth's B field) to the magnetizing force (H) in oersteds.

Magnetostrictive materials are piezoelectric in character, and have a very high resistance to electrical current flow. Examples are:

- | | |
|---|-----------------|
| 1. Permealloy Negative Magnetic Permeability | > 80,000 |
| 2. Sendust Negative Magnetic Permeability | 30,000 -120,000 |
| 3. Metglas Negative Magnetic Permeability | > 200,000 |
| 4. Iron with (34%) Cobalt Magnetic Permeability | 13,000 |
| 5. New Technology Magnetic Permeability | > 1,000,000 |

ELECTRICAL ENERGY SYSTEMS METHODS

1. DIRECT - Faraday's "Action at a Distance" incoming magnetic wave conversion to useful electrical energy. This includes Cosmic, Galactic, Solar and Magnets. Technology Transfer is from Solar Cell Technology.

2. INDIRECT - Electron Stimulation-Induced Electron Spin Systems, Electron Avalanche Pumping Systems

Primitive, Indirect Conversion from another form of energy. Coils and Magnet as in Dynamo Systems (Closed Systems). Chemical Systems, Atomic, Pons & Fleischman and etc.

Advanced, Direct Conversion, Magnetic Wave (Open Systems).

Ambient Sources

Air Core Coil Systems

Gaseous Tube Systems,

Solid State Marx Generator Avalanche Type Systems.

Leyden Bottle Capacitor Types inserted in Lakes and other.

Magnet Systems

Electron Beam Antenna Systems

3. TRANSFER MECHANISMS

Solids - as in metal conductors

Gaseous as in radio wave transmission, a form of ionization.

Sensitizing of Systems by use of Trace Doping with Radioactive elements, includes metal surfaces.

Open Systems, non-linear with external forces. Albert Einstein in a direct quote from his biography states that these are excluded from the conservation of energy laws.

Closed Systems Maxwellian Type Systems. Mathematics are predictable requiring deductive reasoning. Ohm's Law is King, and Establishment Intellectuals being comfortable with this, brand all else as a violation of the Laws of Nature by obtaining something for nothing. This is Dishonesty grand mal.

AMBIENT ENERGY SOURCES

<i>Radiation System</i>	<i>Diffusion Method</i>	<i>Magnetic Wave Energy</i>
1. Cosmic	Reflection, Deflection and Absorption	Ultraviolet
2. Galactic	Reflection, Deflection and Absorption	Infrared
3. Solar	Reflection, Deflection and Absorption	Visible Light
4. Earth	Reflection, Deflection, Absorption, Faraday's "Action at a Distance" also, a Composite of all of the above	Earth's Electrical

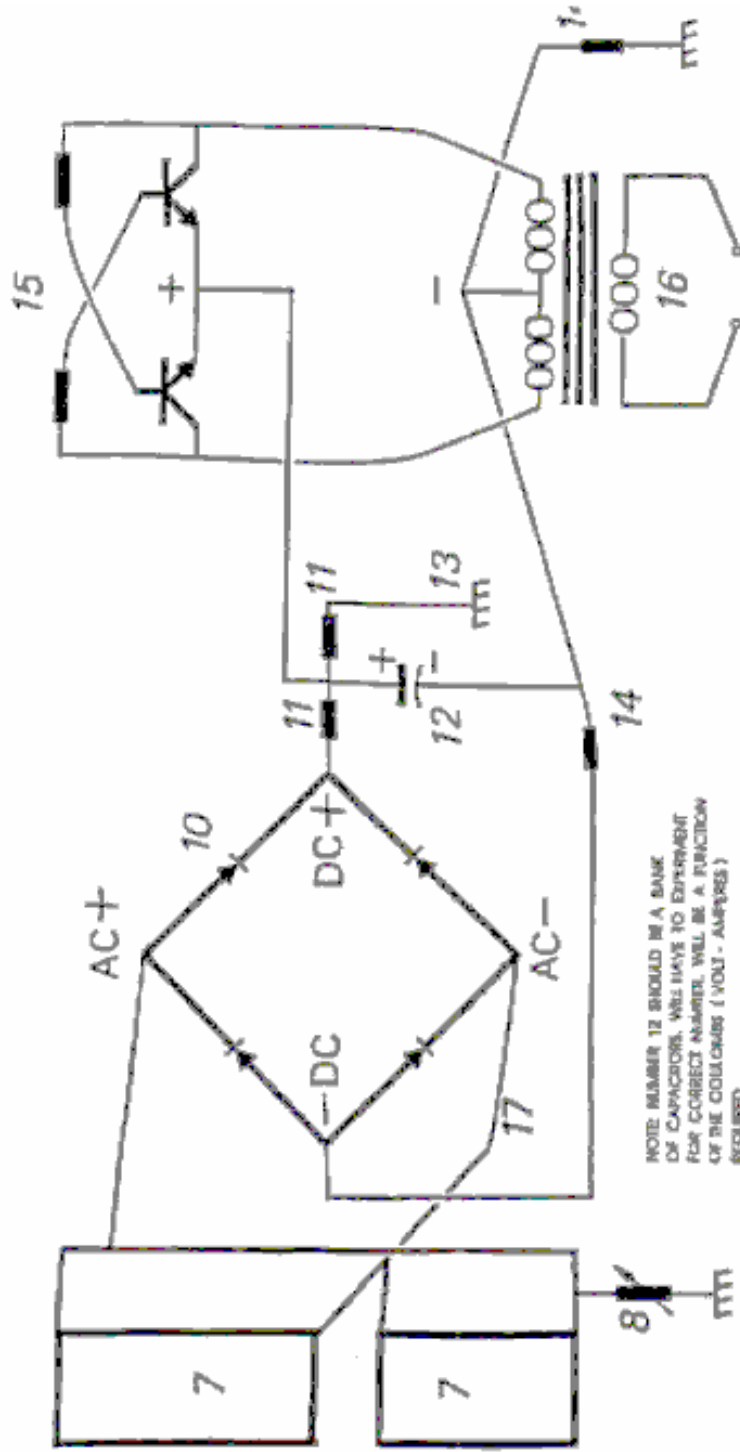
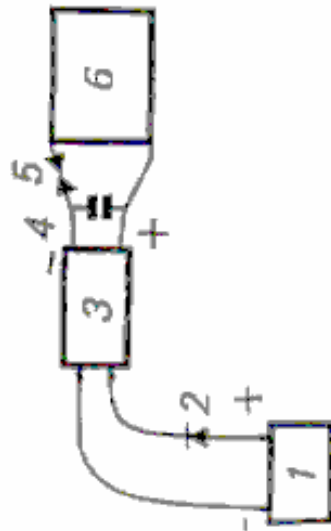
A deep fog pervades the entire Scientific Community with regards to the Significance of the Above Energy Sources. Magnetic Waves convert directly into Electrical Waves (useful electricity). Two sides of the electromagnetic system are always present and never separate. Local electron spin provides (action at a distance) the flip side of the incoming magnetic wave energy.

Enormous amounts of incoming magnetic wave energy becomes a part of the Ambient Background, and as such, cannot be measured directly. Reconstruction from indirect information, allows us to establish the actual energy levels which are present. Instruments provided by the Scientific Community measure only point "A" to "B", and when both are ambient, no potential energy is shown. This is the "bird sitting on the million volt power line and sensing nothing" approach. The Earth's actual ambient background has as it's Energy level multi-billions of Volts, which are conveniently and obviously ignored by the scientific community. When properly understood, this enormous, never-ending source of environmentally-friendly energy becomes available.

ELECTRICAL ENERGY GENERATING SYSTEM

Patent Pending 08 / 100,074

NOTE: IF THE PLUG CONNECTOR (2)
WIRE'S LENGTH IS A WAVE LENGTH
COMPONENT OF THE L-1 OR L-2 FREQUENCY,
THE BATTERY WILL RECHARGE IT'S SELF AT
THE SAME TIME IT IS BEING USED. TO SEE
THIS SUBSTITUTE TWO OPPOSING LIGHT
EMITTING DIODES. THEY SHOW THE
DIRECTION THE ELECTRONS ARE MOVING.
DC ELECTRONS OUT AND RADIO FREQUENCY
ELECTRONS INTO THE BATTERY.



NOTE: NUMBER 12 SHOULD BE A BANK
OF CAPACITORS. WILL HAVE TO EXPERIMENT
FOR CORRECT NUMBER. WILL BE A FRACTION
OF THE COLLECTORS (VOLT - AMPERES)
REQUIRED.

1. Geigel, 6 or 12 Volt,
2. Diode, Pass. use a Varactor.
3. High Voltage Module, Constituting the L-1 and L-2 Coils.
4. Capacitor, TDK 10.9 Pf., 30 KV.
5. Spark Gap, Small Engine Spark Plug. Gap = .0025 in.
6. Induction Transfer Coil L-3.
7. Induction Receiving Coil L-4.
8. Voltage Control Shunt.
9. Frequency Adjustor, prevents detuning by Diode Bridge
10. Diode Bridge, 200 Nanosecond, R.F., > 100 KV .
11. Voltage Divider Circuit, corrects voltage for next stage.
12. Capacitor, electrolytic, smooths out DC + ripple effect.
13. Earth Ground.
14. Voltage Divider Circuit, corrects voltage for Transformer
15. Inverter Circuit, DC + in and 60 CPS to Transformer
16. Output from Transformer to Load (Work).
17. Center Tap

17 JANUARY, 1977

Electrical Energy System

Don L. Smith, Energy Consultant

At a meeting between J.P. Morgan, Edison and Tesla, Tesla proposed an Electrical Energy System which could be connected into directly, without using a meter. Tesla's Idea of "Free Energy" was not compatible with their thinking. Courtesy of Morgan and Edison, from that day forward, a complete and total bastardization of the Idea has been in progress. Agents for Morgan and Friends include the U.S. Patent Office and Academia. Academia's bad habit of incestuous quoting of each other, eliminates them as a possibility in cleaning up the mess. This selective ignorance, permeates throughout the study of electricity.

Many people, otherwise known as "intellectuals", have a total blackout and become jabbering idiots when "free-energy" is mentioned. The term has been amended to say, "something which was never there is being harvested and that this violates the laws of physics". For the selectively ignorant, this seems the way to run. Those who choose Morgan's drum beat, have severely limited the possibilities built into electricity.

This paper will be an exercise in creative understanding, in placing updated knowledge at your disposal. Whether it becomes a useful tool or is selectively ignored is your choice.

Electrons are defined as being the practical source of electrical and magnetic energy. The electron as a particle, was postulated by professor J. Thompson in early 1900's. It is now universally accepted that the electron exists and that it is the source of electricity. When the electron is agitated it produces magnetic and negative electrical energy. Physics as it exists today, cannot explain why the electron remains intact and is not diminished by the energy it releases. This is a part of the built-in ignorance provided by the Morgan and Edison Camp.

One volts worth of electrons, when cycled, yields one volts worth of electricity. This can be repeated continuously forever and it never deplete or diminishes the electrons in question. They simply return to their air and/or earth source, waiting to do the whole thing again and again. Therefore, electrical energy is available, anywhere and everywhere humans go. People who intercede for profit, set the cost of electrical energy. Otherwise, all electrical energy is free, Morgan and Edison be damned.

Improving upon Professor Thompson's postulation, other obvious characteristics can be seen to further define the electron. It has both magnetic and electrical emanations resulting from a right-hand and left-hand spin. Since magnetism and amperage come as one package, this suggest, that electrons in their natural non-ionic state, exist as doublets. When pushed apart by agitation one spins and supplies electricity and the other spins and provides magnetic (amperage) energy. When they reunite, we have Volts x Amperage = Watts. This Idea, until now, has been totally absent from the knowledge base.

The number of times that an electron is cycled, sets the collective energy potential present. The electrical equivalent of $E = mC^2$ is $E = (\text{Volts} \times \text{Amperes}) \times (\text{Cycles Per Second})^2$. Those who choose, are now free to head for the bushes and make their usual contribution to humanity.

Prior to Tesla, there was a large group of people in Europe, who were building resonant coil systems for medical use. Amperage was dangerous in their coil systems. The Tesla Coil is only the Voltage half of their coil system, as will be demonstrated.

A short list of those (from 1860 onwards) active in resonate high frequency coil systems include; the Curies, Roentgen, Ruhmkoff, Oudin, Hertz, Levassor, Dumont, D'Arsonval and many others.

Peugeot, Panhard-Levassor, Bollee, Renault and others had successful electric automobiles in production using A C. motors. Various electrically-powered airships, including the Dirigible "France" were in service.

D'Arsonval, Professor of Experimental Medicine at the College of France, invented the electrocardiograph, oscilloscope, amp and volt meters, thermography and numerous other medical applications of high frequency electricity. As early as 1860, he was building high frequency coil systems, which he used in his experimental work. There is a strong connection between the work of Tesla and the people mentioned above.

Electric vehicles of all sorts, dominated until the 1920s, when the electric starter motor made the internal combustion engine practical. Prior to that, upon cranking, it frequently would break the owner's arm. At that point the use of batteries as a source of power was replaced by oil.

The establishment's carpet has some rather large lumps under it. Coulomb's and Newton's inverse square law is politely ignored and it's opposite is allowed to have only the most abstract status. Without opposites we have no definition.

The source value of a remote flux reading, requires the squaring of the distance, times the remote reading, to obtain the original value. The opposite of this, being the derivations relate to Energy equals Mass times the Velocity constant squared. The electrical equivalent, being Energy equal capacitance times voltage squared and Energy equals induction times amperes squared. Flux lines increase as the law of squares and then activate electron energy which was not previously a part of the sum. The cumulative capacitance and inductance increase as the outer ends of a Tesla coil are approached, and this results in output energy being greater than the input energy present. This Energy is real. It can be safely measured by magnetic flux methods and electrostatic voltmeters, based on the inverse square law

As seen above, flux lines result both from induction-henrys-amperage and capacitance-coulombs-volts, and define electrical energy. The non-linearity of this system does not obey Ohm's law, which is replaced with impedance and reactance for alternating current systems. Impedance is the sum of the system's resistance to AC current flow, and this becomes zero at resonance. In resonant induction systems, a cycles-per-second increase, invokes a second round for the law of squares.

The degree to which flux lines are present, disturbs an equal amount of electrons, upsetting the ambient background energy, resulting in useful electrical energy being obtained. The frequency at which the disturbance occurs, increases the useful energy available, and it obeys the law of squares. Two square-law components, *flux density* and *frequency* are involved. Enter resonance which cancels the resistive effect.

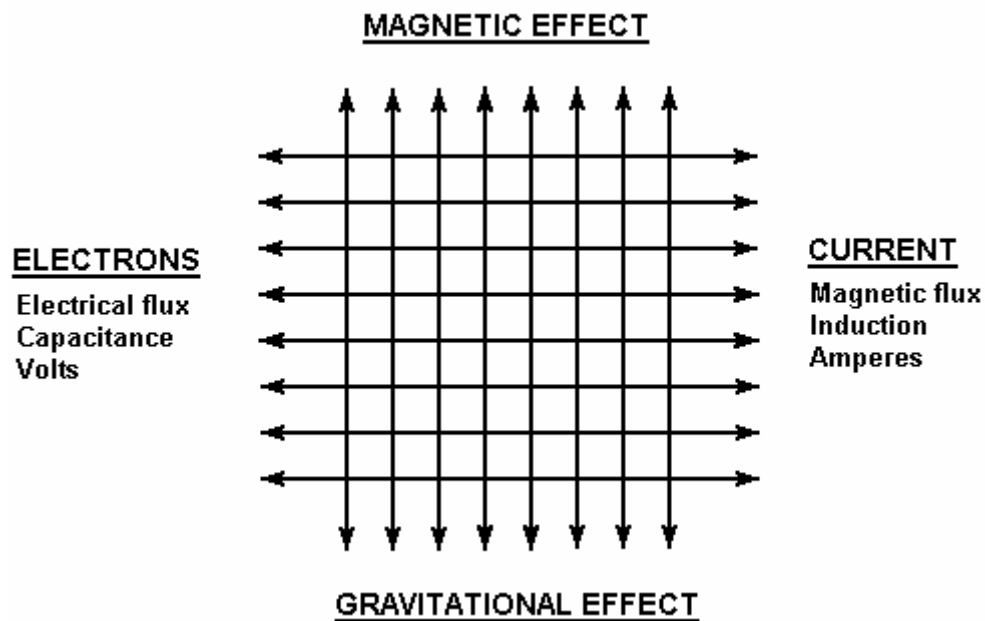
Only the electrical energy which is either above or below the ambient level is useful. For the Central U.S. going east to west, ambient as approximated by electro-static voltmeters and flux methods is 200,000 volts on a solar-quiet day. At night time, the ambient energy level drops to about one half of the daytime value. On a solar-active day, it may reach more than five times that of a solar-quiet day. Ambient background energy at the polar regions, is approximately 500,000 volts on a solar-quiet day. The background energy varies as it relates to the North-South component and the East-West continuum.

This leaves us with an interesting problem. Electrons, when disturbed, first produce magnetic flux and then produce electrical flux when they spin back to their normal position. Therefore any electron movement produces above ambient energy, being over unity.

ELECTRICAL ENERGY WITH ASSOCIATED PHENOMENA

1. Current-amperes results from the unequal distribution of negativity (electrons).
2. Electron spin causes electrical current and magnetic lines of force.
3. Magnetic imbalance causes the gravitational effect. This is evidenced in electric motors by magneto-gravitational displacement of mass, which causes the motor to rotate.

ENERGY LINES OF FLUX (FORCE) FIELDS & WAVES *

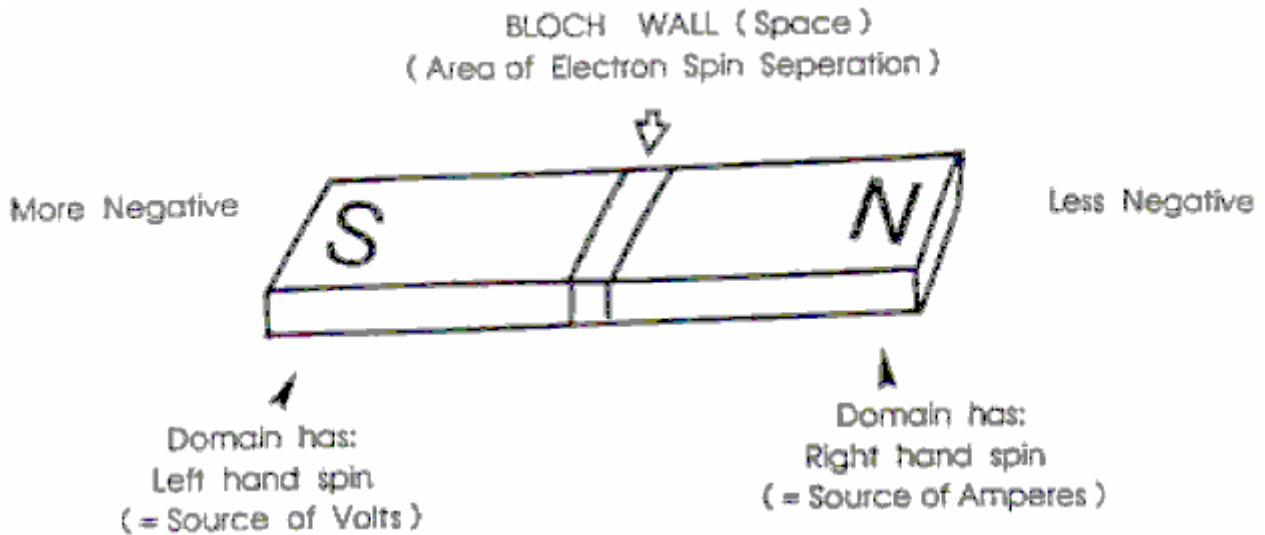


* Below 20,000 Cycles Per Second = **Fields**
Above 20,000 Cycles Per Second = **Waves** (Radio Frequency)

Derivation of Magnetic and Electrical Power

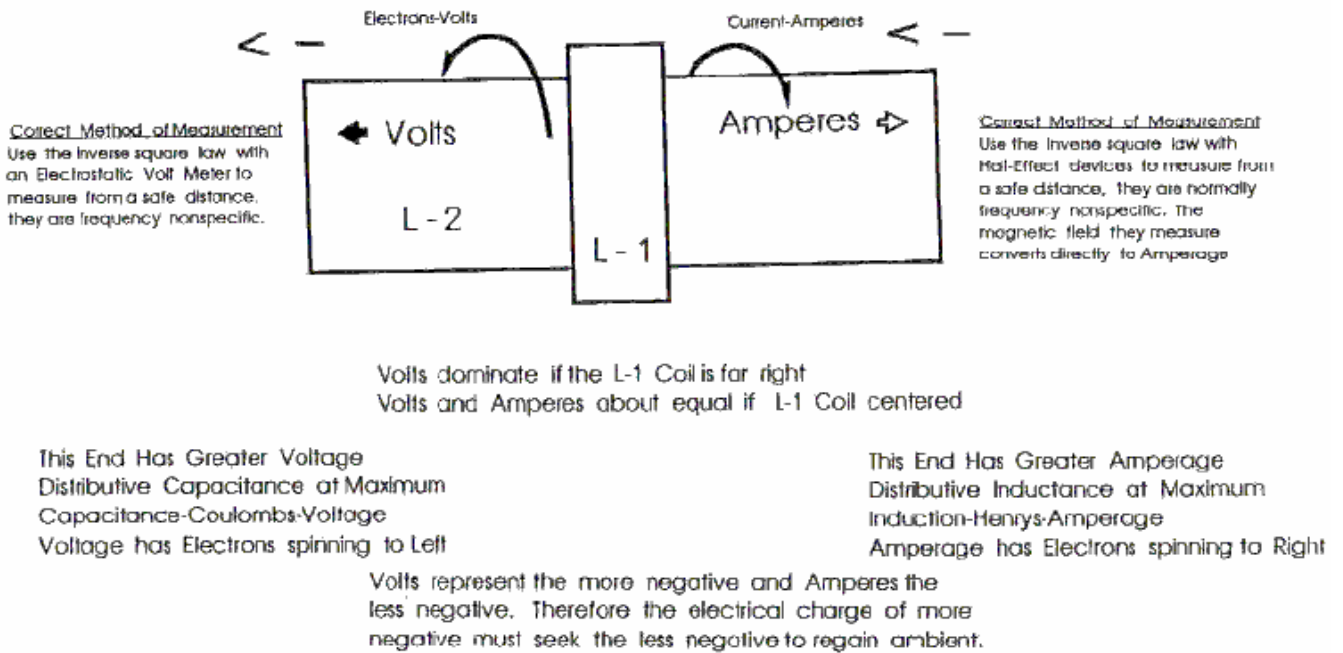
Analogous Relationships:

1. Potential Power is present in a bar magnet as shown:



2. The Source of these Electrons being from the Solar Plasma, are non-ionic and occupy all Free Space. They are commonly obtained from Earth and Air Groundings. They exist in Doublet Pairs, one being more negative than the other. The more negative one has a Left Hand Spin. The less negative one has a Right Hand Spin.
3. Resonate Electrical Coil Systems (Tesla) are Analogous to the System observed in the Bar Magnet (above). The Bloch Wall Area is Located at the base of the L-2 Coil. The Left Spin portion of the coil (Voltage Only) Coil predominates. The Right hand Spin portion of the coil (Magnetic-Amperage) is mostly absent.

Tesla Coil Geometry *



* Contains proprietary information related to Patent Procedure
Geometry - properties of lines, surfaces and solids

Donald L. Smith
2 November, 1995

Induced Electrical Energy System

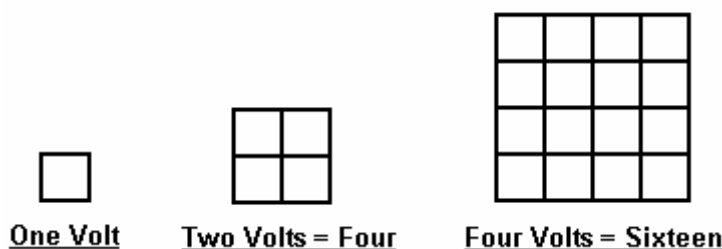
Collection and transfer of energy requires temporary storage, which occurs as capacitors and coils of a resonant circuit are cycled, on and off. The frequency at which the capacitors and coils are pumped, determines the amount of electrical energy that moves onward.

The amount of Energy transferred relates directly to the density of lines of flux present. The Kinetic Energy Formula is helpful in establishing the amount of energy present. This formula squares the velocity times mass. In the case of electrical energy, the intensity of voltage and amperes multiplied by the cycles per second, replace the velocity component.

Note that the "acceleration" of the Voltage "E" and Amperage "I", which increase as non-linear components, then obeys the Law of Squares.

Each unit of increase, causes a squaring of the flux lines present. The amount of energy transfer caused by this increase in flux lines is demonstrated below.

Increase in Flux Lines Present Symbolized



In resonant air-core coil energy transfer, the increase in flux lines present disturbs more electrons than previously, resulting in over-unity energy being present and available.

Energy stored, times the cycles per second, represents the energy being pumped by the system. Capacitors and inductors store electrons temporarily.

Capacitor formula: **$W = 0.5 \times C \times E \times \text{Cycles per second}$** where:

W = energy in Joules (Watt Seconds)

C = capacitance in farads

E = applied potential in volts squared.

Inductor (Coil) formula: **$W = 0.5 \times L \times I \times \text{Cycles per second}$** where:

W = energy in Joules (Watt Seconds)

L = inductance in henrys

I = current in amperes squared

Both one henry, and one farad, equal one volt. The higher the cycles per second, including the squaring of the flux lines, cause a large increase in the amount of energy being produced.

The above combined with a resonant energy induction system (where all electrons are moving in the same direction at the same time), make the next move into over-unity practical.

The dampening process of conventional electrical power generation, has all the available electrons bouncing randomly, mostly cancelling out each other. In that System, the useful energy available is a very small percentage of the energy which is present.

In the resonant induction system, a very high percentage of the energy present is useful. At resonance, (ohms-impedance-Z) becomes zero and all of the energy present is not degraded and becomes available to do useful work. "Ohms" is load or wasted energy, and "amperes" is the rate of that wasting of energy.

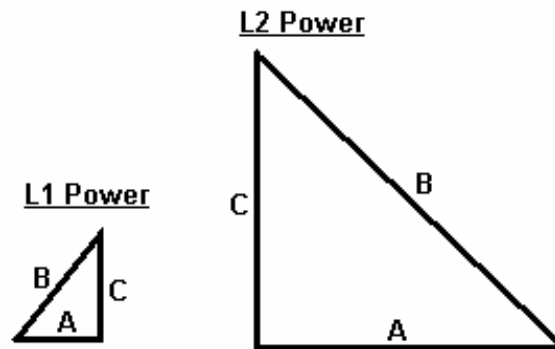
Using the previous information, if we now apply it to an air-core coil, resonant transformer energy system. L-1 and L-2 coils are now present. L-1 has a smaller number of turns and is several times the diameter of L-2. Input from a 12 volt high-voltage laser driver source, produces 8,000 volts with a low level of wasted energy, pushing amperage into, say, 4 turns of coil L-1. Each turn of the L-1 coil then acquires 2,000 volts of resonant potential. Consequently, each turn of L-2 is then exposed to the electric flux of 2,000 volts. Each turn at the bottom end of L-2 acquires 2,000 volts. The flux lines are squared and are additive as the voltage and amperage progresses towards the top end of L-2's large number of turns.

A huge number of additional flux lines which were not previously present become present at the top end of the L-2 coil. These flux lines excite the nearby electrons in it's earth and air and groundings. This high level of excitement above the ambient, causes a large number of electrons which were not previously a part of the energy present, to become available for use. At this point over-unity is present in large amounts.

The "bubble gum between the ears" response to this is: "this must be lots of volts but no amperes". Please recall that amperage is wasted energy, and that until that wasting occurs, there are no amperes. A good way to demonstrate this, would be to let the bubble gum crowd put their hands on the high-voltage end of the device while standing on wet ground (a people zapper). **Note: don't do this.**

This over-unity device produces energy at radio frequencies which range into the megahertz band. This allows the device to be small in size, and yet produce large amounts of energy. A megawatt-sized unit will sit comfortably on a breakfast table. This energy is changed to Direct Current and then switched to produce the desired working frequency AC.

Power Triangle



A: Volts x Amperes (the Available Power)

B: Volts x Ampres x Time (the Used Power)

C: Volts x Amperes x Recative (the Resinant Power)

1. Random movement of electrons in "A" and "B", mostly cancel each other out. This dampening, or wasteful concept of energy, is a source of much pleasure for the establishment.
2. "C" (Volt, Amperes, Reactive "V.A.R."), is the situation where all of the electrons move in the same direction at the same time. This results in near-unity energy output by resonant induction transfer.
3. Resonant induction transfer from one isolated power system, allows other resonant induction systems to duplicate the original source, which in no way diminishes the original source. Air-core coils (isolation-transformers) confirm this when they are a part of one of these functioning systems. A less perfect illustration would be the fact that the number of radio sets tuned to a particular radio transmission, does not alter the power required at the radio transmitter.
4. Resonant induction transfer, disturbs a large number of adjacent electrons which were not a part of the original input power source. The pulsating-pumping effect then draws in the newly available additional electrons into the on-going energy generation system. A near unity energy system of resonant air-core coils and the extra acquired electron-energy source constitute an over-unity system.

Electrical Power Generation / Points of Reference

Useful Electrical Power is Generated when Electrons from Earth and Air Groundings are disturbed by the movement of coils and magnets with reference to each other. The resulting electrical and magnetic energy is then changed to joules [watt-seconds: Volts x Amps x Seconds]. Each forward electron movement results in a magnetic impulse and each return movement causes an electrical impulse. The composite of the electrical energy impulses from these electrons yields useful energy [Power].

Let the above electron movement be represented by a room full of ping pong balls bouncing randomly. Most of the energy present cancels out by random impacts. This is the Classic Under-Unity approach to Electrical Power Generation, sanctioned by the Establishment.

In contrast to that, in the Electrical Energy Generation System presented here, the resonant Electrons are all moving in the same direction at the same time. This allows Near-Unity Electrical Power to Develop. This is the room-temperature equivalent of super conductivity.

The Energy System presented here, consists of a properly-adjusted and functional resonant air-core coil tank. The magnetic energy is stored in the coil system and the Electrical Energy is stored in capacitors. From Maxwell and others, we know that electrical-related energy has an equal amount of magnetic energy associated with it.

"The formula which establishes the Useful Energy of the System":

$$\text{Joules} = 0.5 \times \mathbf{C} \times \mathbf{V} \text{ squared} \times \mathbf{C.P.S.} \text{ squared}$$

units:

$$\text{Joules} \quad (\text{Volts} \times \text{Amps} \times \text{Seconds}) \quad \text{Watt Seconds}$$

C = Capacitance in microfarads

V = Potential in Volts

C.P.S. = Cycles per second

The transfer of Electrical Power by Resonant Induction is a direct function of the squaring of the cycles per second. For example, square 60 C.P.S. and then square the radio frequency C.P.S.s of the System here presented. Obviously, One Million Cycles per Second transfers more energy than Sixty Cycles per second. The Sanctioned Method of Electrical Power Generation uses the 60 C.P.S. Method. Using 60 C.P.S. and the random scattering of the Electrons System, assures the Establishment of it's desired Under-Unity Goal.

This random bouncing of the Electrons is the Ohms of Ohm's Law and is used to establish the rate of dissipation and/or Load [Work].

In the Resonant Tank Induction Energy Transfer System presented here, Impedance [system resistance] replaces the conventional ohm's usage. At Resonance, impedance becomes zero and the full force and effect of the Energy Transfer occurs. This is superconducting conditions at room temperature. At radio frequency the Electrons do not pass through the conductor as they do at lower frequencies. Instead, these Electrons encircle the conductor and are free of the conductor's resistance.

Let the Establishments Power Generation System be called 'A' and the System presented here be called "B".

With "A": Given 60 C.P.S. at 120 Volts using a 10 microfarad Capacitor:

$$\text{Joules} = [0.5 \times 0.000010 \times 120 \text{ squared}] \times \text{C.P.S.s squared}$$

$$(120 \times 120 = 14,400)$$

$$[0.000010 \times 14,400 = 0.144]$$

$$[0.144 \times 0.5 = .072]$$

$$(0.072 \times 3,600 = \mathbf{259.2})$$

Using the Inventor's Resonant Induction System, the Electrical Power available would then be 259.2 Joules [Watt-Seconds]. Using the Establishment's method only permits less than 10 Watt-Seconds of Useful Electrical Energy.

"B". Given One Million Cycles per second at 100,000 Volts, using a 10 microfarad Capacitor.

$$\text{Joules} = [0.5 \times 0.000010 \times 100,000 \text{ squared}] \times \text{C.P.S.s squared}$$

$$(100,000 \times 100,000 = 10,000,000,000)$$

$$[0.000010 \times 10,000,000,000 = 100,000]$$

$$(100,000 \times 0.5 = 50,000)$$

$$(50,000 \times \text{One Million squared} = \mathbf{50,000,000,000,000})$$

The useful Electrical Energy available is greater than 50 Mega Watts. Since the Resonant Electrons are non-impacting, all of the Energy is available for direct usage.

Benefits of the Inventor's System

1. Induction Energy transfer is enhanced by the squaring of the cycles per second produced by the System.
2. Induction Energy transfer is enhanced by the squaring the input voltage and amperage.
3. The increase of the flux lines occurring from the above, disturbing more electrons, causes more electrical energy to become available.
4. Resonant Induction has all of the Electrons moving unimpeded, resulting in superconductor conditions at room temperature.
5. A smaller amount of energy is used to disturb a larger number of Electrons. Electrons not originally a part of the System then contribute their energy, resulting in a net gain in available usable power.
6. The physical size of the System [Device] is small. The Device described in "B" sits comfortable on a breakfast table.
7. A small energy source is used to start the device and that source remains fully charged at all times by the System.

The Evidence Against Under Unity

1. Use of Logarithmic Scales on electrical measurement instruments. Linear measurement works fine where Ohm's Law applies (direct current). In alternating current, ohms are replaced by impedance and the measurements become non-linear.
2. Infinite "Q" at resonance confirms that voltage and amperage is squared, as in the kinetic energy formula. See the formulas of this report.
3. Square waves are clipped infinite "Q"s.
4. Maxwell and others show that magnetic-inductance-amperage and electrical-capacitance-voltage are two sides of the same coin. Magnetic-inductance is directly equal to amperage. Both obey the Law of Squares, which has over-unity built in.
5. Magnetic and electrical flux are present in enormous amounts at the outer ends of an operating Tesla Coil.
6. Ignorance of how to measure and relate magnetic and electrical flux, is the chief weapon of the under-unity gaggle.
7. The Cumulative inductance and capacitance of the Tesla Coil grounds itself out, if not properly utilized. See this report for the temporary energy storage accessible, when properly managed.
8. The Patent Office refers devices related to over-unity to their metering group, which is a sure indication that they are aware and accept the logarithmic measuring devices. This is direct and absolute evidence that they accept the square law as it relates to kinetic energy. This also indicates they are aware that over-unity exists. Since their bureaucratic brain is improperly motivated they continue to badger inventors who are working in the over-unity arena. Their level of intellectual dishonesty is sanctioned by, and is a real part of doing business with, a government which prides itself in being a hooliganistic bureaucracy.

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An Answer to America's Energy Deficit

Donald L. Smith

Energy Consultant

Energy, energy everywhere and not a Joule to Jounce. Conventional wisdom, when properly tuned will appreciate the nature of energy, as here presented. The basic unit of electricity (the electron) upon encountering a moving magnetic field (or wave) spins, giving off an electric impulse. When this impulse collapses, it spins back to it's natural position, giving off a magnetic impulse. Therefore, magnetic and electric are two sides of the same coin. When the magnetic side is pulsed, it yields electricity and conversely, pulsing of the electrical side yields a magnetic field. Moving one in relation to the other produces useful energy. When done consecutively, each cycle pushes (current) forward, while pulling electrons into the system... in much the same way as a water pump moves water. These electrons are obtained from Earth and air grounding.

The word "electric" comes from the Latin word electron "amber". When rubbed, amber develops an electrical charge, which can be transferred to a dissimilar substance. During the seventeenth and eighteenth centuries, a great deal of attention was centered on this attribute of amber. Amber was used to differentiate the non-metals. Carbon-related substances and other non-metals, when subjected to friction, give up negative electrical charges. On the other hand, metals when subjected to friction, simply conduct the charge. It is important to note that approximately 70% of the Earth's exposed crustal portions (surface) consist of silicone-related non-metals (electron donors) and become a direct source of electrical energy when properly agitated.

Useful electrical energy can be obtained by grounding into the Earth's non-metal crust and into it's atmosphere as a natural source of electrons. These electrons have accumulated from the solar plasma during the aging of the Earth for more than 4.5 billion years, at a rate exceeding 3.9 exajoules per year. This indicates that the Earth's electrical field contains in excess of 17.6×10^{18} of cumulative exajoules of energy. One exajoule is the approximate energy equivalent of 125 million barrels of oil. The electrical energy in one display of lightning is approximately ten trillion joules. During each 24 hour period, the land portions of Earth's surface yields in excess of 200,000 emissions, which involves more than 2,000 quadrillion watts.

C.F. Gauss (1777-1855) and H.C. Oersted (1777-1851) were each separately trying to define the Earth's electrical field with all external influences removed. These external influences being solar-quiet periods and being remote from the land's surface. The air electricity background which they measured varies with latitude. Their European measurements correspond to approximately the latitude of Washington, D C. They were measuring magnetic field flux as an indicator of negative electron energy active and present. A related family of measurement are now presented. Units of measurement used to define flux fields include Gauss (one unit = 100,000 volts), Oersted (one unit = 50,000 volts), Tesla (one unit = 10,000 Gauss) and Gamma (one unit = 1/10,000 of a Gauss). Much confusion exists in electrical related publications about these units. As presented here they are correct with values taken from their original definitions.

The entire surface of the Earth has been surveyed by aerial magnetometer, in most cases using gamma or nano teslas. One gamma is the magnetic flux equivalent of 10 active volts of electricity. When the data is corrected for flight height it becomes obvious that there are numerous areas where the gamma readings exceed one trillion gammas. Lightning strikes from the ground up are in that energy range. With knowledge of these electron enriched areas, the quality of Earth grounding, becomes enhanced. The correction necessary for land surface data when acquired from aerial magnetometer maps (using Coulomb's law) requires that the remote distance be squared and then multiplied by the remote reading. As an example, if the remote reading is 1,600 gammas and the flight height being 1,000 feet. Take $1,000 \times 1,000 = 1,000,000 \times 1,600$ gammas = 1.6 trillion gammas $\times 10$ volts = 16 trillion volts equivalent for land surface data. Present day methodology requires mechanical energy in exchange for electrical energy. Once obtained, this energy is subject to Ohm's Law. Present Methodology obtains it's electrical energy from it's non-metal and air groundings.

This same energy can be obtained without the wasteful mechanical approach and at a much, much lower cost. Any required amount of electricity is available by resonant induction transfer from the

Earth's magnetic and electrical fields. The major difference is in the functioning of Ohm's Law in relation to resonant circuits. In the resonant induction system suggested here, system resistance (Z) becomes zero at resonance.

Therefore, Volts and Amperes are equal (V.A.R.) until work (load) is introduced.

Each cycling of this resonant induction system pulls in additional electrons from the Earth's electrical field, generating electrical energy in any required amount. In this system, a small amount of electrical energy is used to activate and pull a much larger amount of energy into the system.

This electrical advantage corresponds to the pulley and lever of the mechanical world. The electrical system presented here is extremely efficient. Using present methodology as a basis for comparison, with its 60 cycles per second system. The resonant induction system, cycling at 60 million times per second produces one million times the energy which is produced by the present energy systems. A single small size unit of the resonant induction system has more usable electrical output than a major conventional unit. The radio frequency energy produced is easily changed to Direct Current, and then to the present 60 cycles per second system in preparation for commercial usage.

The Patent Pending on this system is #08/100,074, "Electrical Energy Generating System", dated 4 February, 1992.

Definitions: One **Joule** is one watt for one second
One **Watt** is one volt ampere
V.A.R. is Volt Amperes Reactive

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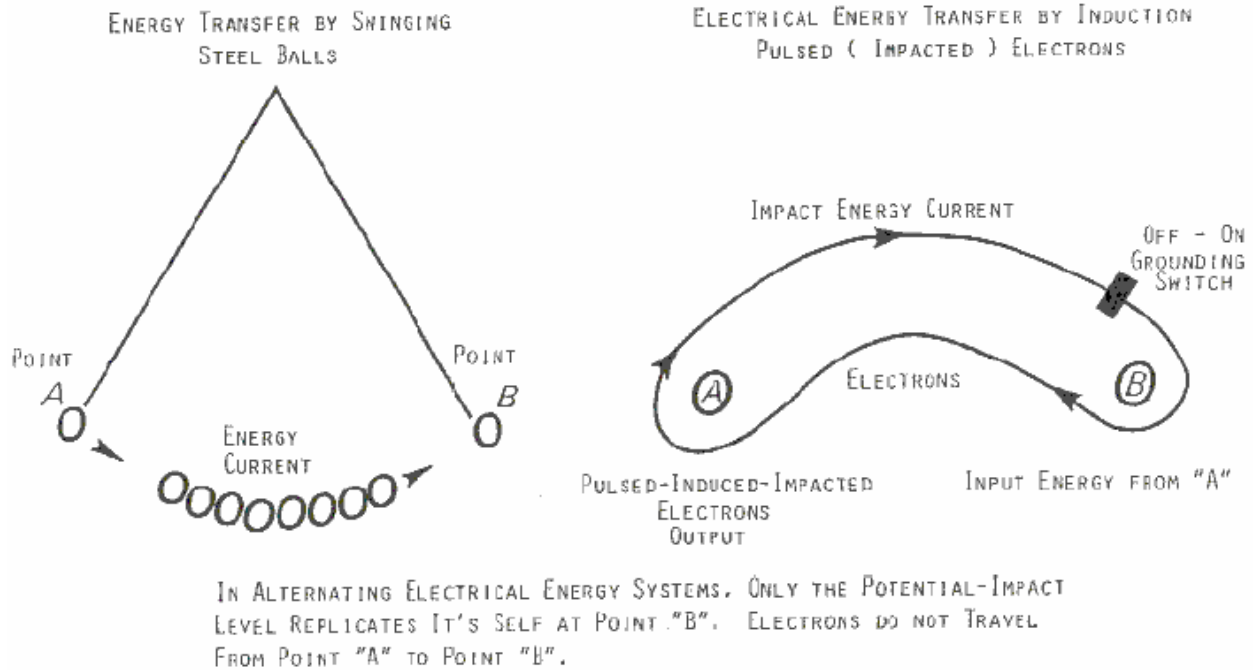
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ALTERNATING IMPACT ENERGY TRANSFER ANALOGY



E.E.S. II, BACKGROUND INFORMATION & CONCEPT

With alternating electrical current, electrons do not move from point "A" to point "B" as commonly envisioned! Electrical potential (oscillating electrons) at point "A", results in harmonic electron activity at point "B", when the grounding switch (circuit) is closed. That is to say, point "B" supplies it's own electrons and mirrors the activity of point "A". Impulsing (turbulence) by magnetic induction causes electrons to be pulled into the system, which then oscillates. When the magnetic field collapses (becomes absent) the electrical potential returns to it's natural background level.

Several major flaws are present in the conventional 60 cycles per second method of electrical power generation and it's iron core transformer system. ***This system is handcuffed by the inverse relationship of volts to amperes.*** This represents a stodgy, inflexible inheritance, courtesy of Mr. T.A. Edison and his concept of electrical power generation.

Nikola Tesla stood, almost alone, against Edison and managed to prevail with his Alternating Current system. Without the alternating current system, electronic things in the modern sense would not exist.

This report will be concerned with some of the extensions and benefits of the alternating current electrical system. ***This study will limit it's scope to air core coil transformers at radio frequency and upwards. The electrical power produced by this method is inverted to Direct Current and then to Alternating Current as required for popular usage.*** There are several important advantages of this system over conventional power generation.

Start with two coils (separate-apart), one being a reactor coil (L-1) and a second coil (L-2), being the reactant coil. Magnetic field fluxing (off-on of the electrical source) causes inductive reactance of L-1 which replicates by induction in L-2. Pulsing of the magnetic field (from L-1) in the presence of L-2, generates electrical potential. For example, should the L-1 coil have ten turns, with an imposed AC potential of 1,200 volts. This results in each turn of L-1 acquiring 120 volts of potential. This induced magnetic field, then replicates itself in each turn of the L-2 coil. The L-2 coil may have one or many hundreds of turns. Modern encapsulation techniques makes high frequency and high energy controllable.

Let's take another important step in this air-core transformer process. For purpose of discussion, let the value of inductive reactance at 60 cycles per second, equal one. Each time the frequency is doubled, the effectiveness of induction is squared. At about 20,000 Hz, **when radio frequency is achieved, the electrons begin spinning free, outside of the inductor and they become increasingly free of the inverse relationship of volt-amperes.** From this point on, they replicate by the inductive process as V.A.R.. *That is to say, volts and amperes are equal, until resistance (work) is introduced. Therefore, additional, not previously available electrons become incorporated for a very large net gain in potential. This gain is real !*

The quality of the grounding system determines the effectiveness of this method of producing electricity. A handy reference to locate the negative grounding areas for power generation can be found in the Aeromagnetic Map Studies of the US Geological Survey. They provide an excellent method for locating the best sites for optimum negative grounding areas.

When this method is combined with the induction coil system, already described, it provides an electrical power generating system millions of times more efficient than any known conventional method.

This new system ("E.E.S. II") is uncomplicated, physically small and it is inexpensive to build. The technology required for it's construction already exists. Maintenance is near zero, as there are no moving parts. Once operating, this system could last forever.

Small mobile E.E.S. II units are already available as replacements for the batteries used in electric automobiles. Larger E.E.S. II units can be provided as a replacement source of power for hotels, office buildings, subdivisions, electric trains, manufacturing, heavy equipment, ships, and generally speaking, any present day application of electrical power.

Earth Electrical System II, Modular Units

The system consists of three separate modules. Reverse engineering is used in matching the modules to the desired usage.

HIGH VOLTAGE INDUCTION TRANSFORMER MODULE:

1. Preferably an off-the-shelf-unit similar to a TV flyback and/or automobile ignition type related coil (transformer).
2. Ratio of input to output may be from less than 1:100 to greater than 1:1,000 A voltage tripler may then be used.
3. A connection allowing the high voltage output to pass onward through the induction coil L-1 and then to it's grounding.

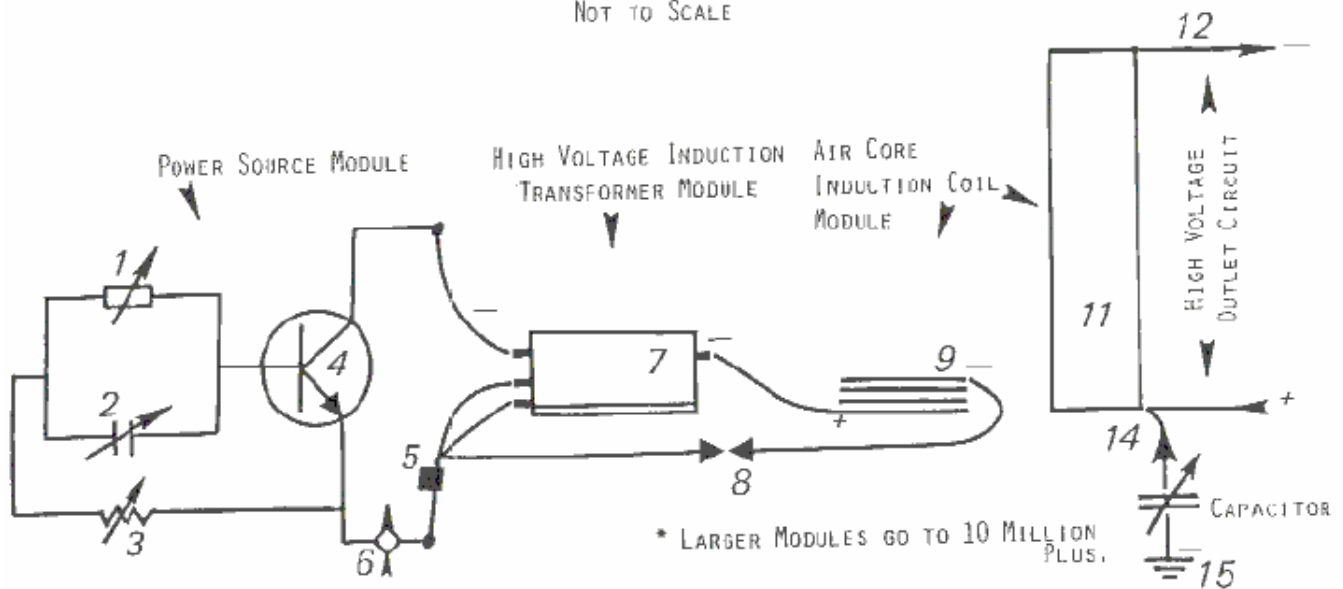
AN AIR CORE INDUCTION COIL TRANSFORMER MODULE:

1. There are two coils: the reactor coil L-1 and the reactant coil L-2. L-1 has a high voltage radio frequency capacitor between it and it's grounding.
2. Input into the L-1 inductor is divided by the number of turns in it. The magnetic flux field provided from each turn of L-1 replicates itself as an electrical potential in each turn of L-2.
3. L-2 may have one turn or many hundreds of turns. The net gain depends upon the number of turns in L-2. Output from L-2 is in V.A.R. **With this type of output, volts and amperes are the same until work(resistivity) is introduced.**

THE INVERTER MODULE:

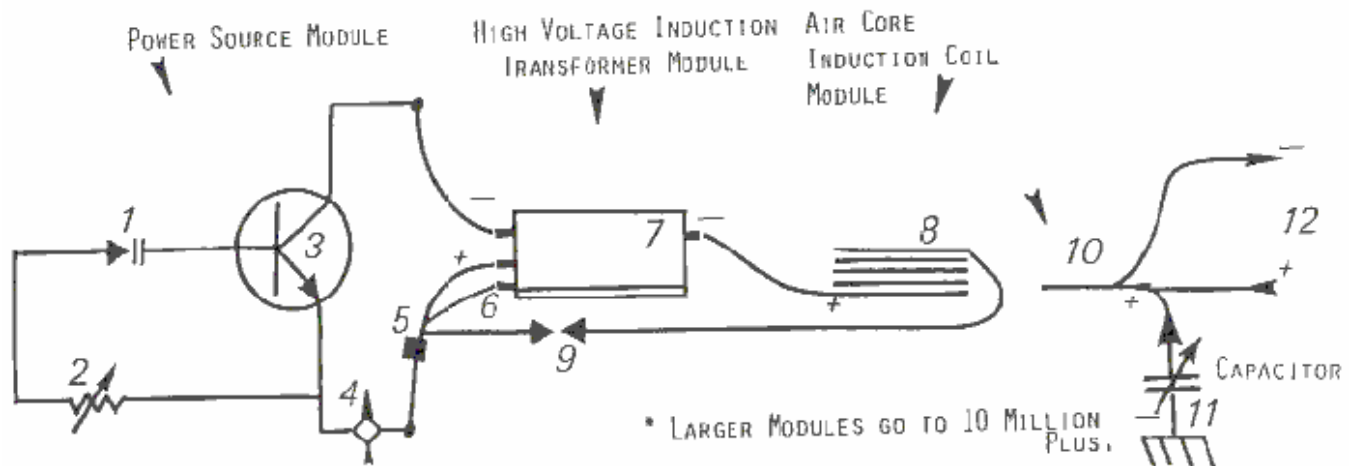
1. Inverts to direct current (D C.)
2. Inverts to alternating current (A C), as desired.
3. Provides customized output of electrical power ready for designated usage

EARTH ELECTRICAL SYSTEM II, DOMESTIC USE RANGE MODULE
 UP TO TWO MILLION VOLT-AMPERES-REACTIVE OUTPUT *
 PLAN "A", WITH VARIABLE CONTROLS
 NOT TO SCALE



- PARTS: 1. COIL, VARIABLE, 2. CAPACITOR, VARIABLE, 3. RESISTOR, VARIABLE, 4. TRANSISTOR, R.F., 5. BATTERY, RECHARGEABLE, 6. OFF-ON SWITCH, VARIABLE, 7. HIGH VOLTAGE TRANSFORMER, 8. FEED BACK WITH SPARK GAP, 9. REACTOR, INDUCTION COIL, 10. FEED BACK WITH SPARK GAP, 11. REACTANT COIL, 12. OUTPUT FOR # 11, 13. INPUT FOR ELEVEN, 14. GROUNDING FOR ELEVEN.

EARTH ELECTRICAL SYSTEM II, DOMESTIC USE RANGE MODULE
 UP TO TWO MILLION VOLT-AMPERES-REACTIVE OUTPUT *
 PLAN "B", ELECTRICAL AUTOMOBILE ENERGY SOURCE



- PARTS: 1. VARACTOR, RADIO FREQUENCY, 2. RESISTOR, 3. TRANSISTOR, RADIO FREQUENCY, 4. OFF-ON SWITCH, MULTI-POSITION, 5. BATTERY, RECHARGEABLE, 6. TRANSFORMER GROUNDING, 7. HIGH VOLTAGE INDUCTION TRANSFORMER, 8. REACTOR, INDUCTION COIL, 9. FEED BACK WITH SPARK GAP, 10. REACTANT, INDUCTION COIL, 11. GROUNDING FOR # 10, OUT-PUT CIRCUIT, IN VOLT-AMPERES-REACTIVE.

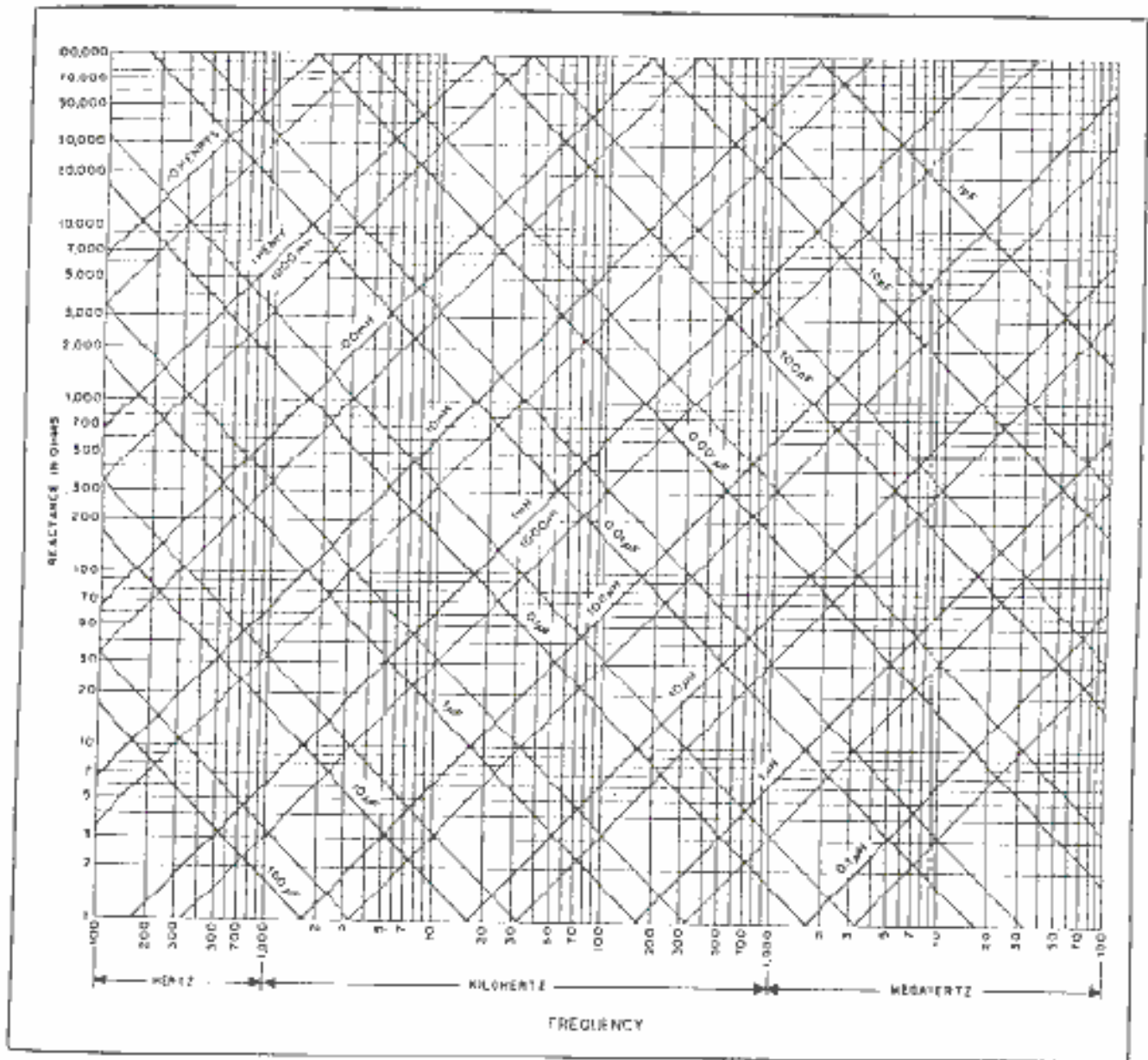


Fig. 44 — Inductive and capacitive reactance vs. frequency. Heavy lines represent multiples of 10, intermediate light lines multiples of five. For example, the light line between 10 μH and 100 μH represents 50 μH ; the light line between 0.1 μF and 1 μF represents 0.5 μF , and so on. Intermediate values can be values within the chart range. For example, the reactance of 10 henrys at 60 Hz can be found by taking the reactance of 10 henrys at 600 Hz and dividing by 10 for the 10 \times times decrease in frequency.

CHART, COURTESY OF A.R.H.L., 1992 Ed.

Speech presented the evening of 23 July, 1994 at the
International Tesla Society Convention at Colorado Springs, Colorado.

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ELECTRICAL ENERGY REFERENCE POINTS
Electrical Energy Generating System
Patent Pending # 08/100.074. 2/4/92

The word "electric" comes from the Latin word electron "amber". When rubbed, amber develops an electrical charge, which can be transferred to a dissimilar substance. During the seventeenth and eighteenth centuries, a great deal of attention was centered on this attribute of amber. Amber was used

to differentiate the non-metals. Carbon-related substances and other non-metals, when subjected to friction, give up negative electrical charges. On the other hand, metals when subjected to friction, simply conduct the charge. It is important to note that approximately 70% of the Earth's exposed crustal portions (surface) consist of silicone related non-metals (electron donors) and therefore becomes a direct source of electrical energy when properly agitated.

Useful electrical energy is obtained by grounding into the Earth's non-metal crust and into it's atmosphere as a natural source of electrons. These electrons have accumulated from the solar plasma during the aging of the Earth for more than 4.5 billion years, at a rate exceeding 3.9 exajoules per year. This indicates that the Earth's electrical field contains in excess of 17.6×10^{18} power of cumulative exajoules of energy. One exajoule is the approximate energy equivalent of 125 million barrels of oil. The electrical energy in one display of lightning is approximately ten trillion joules. During each 24 hour period, the land portions of the Earth's surface yields in excess of 200,000 emissions, which involves more than 2,000 quadrillion watt-seconds of active energy on display.

This physical phenomenon indicates that the Earth's crust is an unending source of electrical energy. The surface area involved is a very small portion of the Earth's crust.

J.C. Maxwell (1891) suggested that an active electron field gives rise to an associated magnetic field. Therefore, both are present with pulsating current. Early studies, involving observation of compass needles by microscopy, revealed that the needle vibrates as with alternating current. More recent studies by A. Nishida and others, confirm that alternating current is common in the Earth's crust.

C.F. Gauss (1777-1855) and H.C. Oersted (1777-1851), both were separately trying to define the Earth's electrical field with all external influences removed. These external influences being solar-quiet periods and being remote from the land's surface. The air electricity background which they measured varies with latitude. Their European measurements correspond to approximately the latitude of Washington, D.C. They were measuring magnetic field flux as an indicator of negative electron energy active and present.

A related family of measurement is now presented. Units of measurement used to define flux fields include Gauss (one unit = 100,000 volts), Oersted (one unit - 50,000 volts), Tesla (one unit = 10,000 Gauss) and Gamma (one unit = 1/10,000 th of a Gauss). Much confusion exists in electrical related publications about these units. As presented here, they are correct with values taken from their original definitions.

The entire surface of the Earth has been surveyed by aerial magnetometer, in most cases using gamma or nano teslas. One gamma is the magnetic flux equivalent of 10 active volts of electricity. When this data is corrected for flight height, it becomes obvious that there are numerous areas where the gamma readings exceed one trillion gammas. Lightning strikes from the ground up are in that energy range. With knowledge of these electron enriched areas, the quality of Earth grounding, becomes enhanced.

The correction necessary for land surface data when acquired from aerial magnetometer maps (using the inverse square law) requires that the remote distance be squared and then multiplied by the remote reading. For example, if the reading is 1,600 gammas and the flight height is 1,000 feet. Take $1,000 \times 1,000 = 1,000,000 \times 1,600 \text{ gammas} = 1.6 \text{ trillion gammas} \times 10 \text{ volts} = 16 \text{ trillion volts}$ equivalent for land surface data.

Present day methodology requires mechanical energy to be expended in exchange for electrical energy. Any required amount of electricity is available by resonant induction transfer from the Earth's magnetic and electrical fields. Each cycling of this resonant induction system pulls in additional electrons, generating energy in any required amount. A small amount of electrical energy is used to activate and pull into the system a much larger amount of energy.

ENERGY VERSUS MASS

Steady State
Static "Pre-Energy"
Mass attracts Mass, Gravity
Dominates

Unsteady State
Kinetic "Energy"
Expanding, Magnetic Energy
Dominates
Electrons moving apart
Pressure decreasing
Cooling effect dominates
Less scattering of Energy
Negative resistance

Contraction, Electrical Energy
Dominates
Electrons moving together
Pressure increasing
Heating effect dominates
Scattering of Energy
Positive resistance

Functions of active Electrons

Electrons become active when placed inside the critical distance allowed by their negativity.

Active Electrons provide:

1. Electricity
2. Magnetics
3. Gravitational thrust as in Electric Motors
4. The source of Visible Light
5. It's charge is Negative

They move in a closed loop as seen in the Icon for infinity, not in a circle as shown in many books. One half of the loop consist of a magnetic impulse and the return half consist of the electrical impulse. This is seen as the classic sine wave of alternating electrical energy.

A flash of light occurs when two electrons suddenly find they are too close together. Daylight results from the impingement of Electrons in the Earth's atmosphere with the Electrons of the Solar Plasma.

My Concept of the Forces of Nature differs from the conventional. It consist of a weak and a strong force, each being additionally composed of electrical, magnetic and gravitational (fields and waves). Any two of the three constitute the third member; Gravity "B" of the weak force competes with humans on a daily basis. Gravity "A" of the strong force is the force that holds the Solar System and the Universe in place. Energy from the Electrons represent the weak force. Energy inside the Atom represents the strong force "A". Controlled resonant induction of any two of the three, changes into the third and is the motor that runs the Universe. We see this in the electrically-induced magnetic thrust against gravity in electric motors.

Weak force is required to dislodge electrons and strong force (atomic) to dislodge protons. Unless dislodged, these particles are of little value in producing Conventional Electrical Energy.

Therefore, in conventional electrical energy production, the particle of importance is the negative electron. Electrons have a "grudging" relationship with other electrons. They like each other, especially at arms length. Like potentials repel each other, and unlike potentials attract. To demonstrate this, take two batteries of the same type, but of a different charge level (unequal potentials). Put the plus and

minus ends facing the same direction. Then with a volt meter, measure the electrical potential between the two negative ends and then the two positive ends. It is obvious that the "more negative" moves to the "less negative" is the correct concept for electrical energy generation. Electrical Energy flow consist of a higher concentration of electrons moving to an area of lesser concentration.

OHM'S LAW WITH CORRECTIONS:

A major obstruction in reference to the correct function of electrical energy is the establishment's incorrect interpretation of Ohm's Law. The corrected version is:

Volts = Energy Available (Potential)

Ohm = Scattering, dissipation of Energy (Load)

Ampere = the rate of, dissipation / scattering of energy

It is important to note that Ohm and Ampere are after the fact, and are not decisive except for the dissipation factor. High Voltage at low amperage simply means that the High Voltage is still intact for future usage. In no way is the potential diminished by low amperage.

EXAMPLES OF OVERUNITY

Dominos did not exist in England when the Laws of Conservation were originally put in place. Otherwise they might have been very different. For example, let us take a long row of upright dominos, (many thousands) and flip number one. The Energy required to flip the first domino must now be added with that of thousands more in order to have a correct assessment.

The Electron itself is an excellent example of over-unity. The electron provides various forms of energy continuously throughout eternity and is in no way diminished. It simply cycles through the system and is available thereafter.

In Electrical Systems, Electrons active at point "A" are not the same Electrons active at point "B". That is to say, the Electrons activated at the Central Electrical Energy Station are not the ones used at your house. When you ground your system by flipping the wall switch, you use your own electrons. In closed energy systems, electrons communicate with and replicate the activity of the overbalanced potential, when provided with Earth and or Air Groundings.

The number of Radio sets and Television sets running at any one time do not diminish, in any way the electrical output of the source station.

For example, let now use an Air Coil Resonant Induction System for the purpose of flipping some electrons. The flipping device (reactor coil L-1) is pulsed, which then provides a resonant induction pulse. In turn, this flips the electrons present at the (reactant L-2) Coil. The energy input in L-1 is divided by the number of turns present. The induced magnetic pulsing in turn flips the electrons in each turn of L-2. If more turns are present in L-2 than L-1, there is a net gain in the Energy present, as demonstrated by the dominos above. The farads and henrys of the resonant system provide the resonant frequency when pulsed by an external energy system. A system shunt in the resonant circuit sets the containment level for energy potential.

The Induction Process itself provides an excellent example of over-unity. When comparing rate of induction, the cycles per second must be squared and then compared to the square of the second System. Let us then compare the 60 c.p.s. System with my 220 MHz Device. Energy produced at radio frequency has several major advantages over the conventional system. Ohm's Law does not apply to a resonant air-core radio frequency system.

For example: When the system is resonant, the following is true:

EXPECTED RESULTS

$$\frac{\text{Energy Potential as Volts}}{\text{Dissipation}} = \text{Rate of Dissipation}$$

ACTUAL RESULTS

Superconductor Conditions take over

$$\frac{\text{Energy Potential as Volts}}{(\text{Dissipation})^*} = (\text{Rate of Dissipation})^*$$

*** OHMS / DISSIPATION IN AIR-COIL RESONANT INDUCTION SYSTEMS: RESISTIVITY BECOMES ZERO AT RESONANCE**

This is named the V.A.R. (Volt Amperes Reactive) System.

When compared to the Conventional Under-Unity iron-core transformer system, the results are over-unity. It is strange that mechanical advantage as in pulleys, gears, levers and others which correspond to the electrical advantage above mentioned, are not considered over-unity devices.

Let us take a closer look at resonant induction. As an example, let a room full of ping pong balls randomly bouncing at a high speed represent the Conventional method of under-unity energy generation. Suppose that by resonant induction the balls all move in the same direction at the same time. When this occurs a huge amount of energy not previously available is present. The resonant air-core coil system lines up the electrons in such a manner that the energy factor is nearly 100 % , and not the 2% or 3% of Conventional under-unity devices sanctioned by the establishment.

Some other devices where overunity is common would be resonant induction circuits present in conventional radio tubes (high plate voltage), negative-feedback systems found in Op-Amps and possibly others.

SUMMARY

Useful electrical energy is achieved when the electron density at point "A" becomes greater than at point "B", (being the more-negative moving to the less-negative concept). Coils moving through a magnetic field or vice versa causes this imbalance.

The mindset of the professional Electrical Engineer is restricted to non-resonant and iron-core coil resonant systems. Ohm's Law, when applied to resonant air-core induction systems, becomes, system resistivity (impedance, Z). "Z" becomes zero at resonance. Therefore, in this system, volts and amperes are equal until load (resistivity) is introduced. This is called the Volt Ampere Reactive (V.A.R.) System. With impedance being zero, the System grounding is coupled directly into the Earth's immense electrical potential. Efficiency of induction relates to the square of the cycles per second. Compare the ratio of the conventional 60 c.p.s. System and the 220 million plus cycles of my Earth Electrical System II.

Electrons which cycle through this system, after being used, are returned intact to their former state for future usage.

Electron spin causes electrical current and magnetic lines of force

The effect of current, results from the unequal distribution of negativity (electrons).

Magnetic imbalance causes the gravitational effect. This is evidenced in electric motors by magnet-gravitational displacement of mass which causes the motor to rotate.

The System is an extension of present technology.

The System and it's source utilizes magnetometer studies.

This System (Earth Electrical System II. "E E S . II") utilizes a fully renewable energy source.

This System utilizes a non-polluting energy source.

This System utilizes an universally available energy source.

Endorsement and Certification of The System can be anticipated by States with pollution problems.

AIR CORE INDUCTION COIL BUILDERS GUIDE

DONALD L. SMITH

Energy Consultant

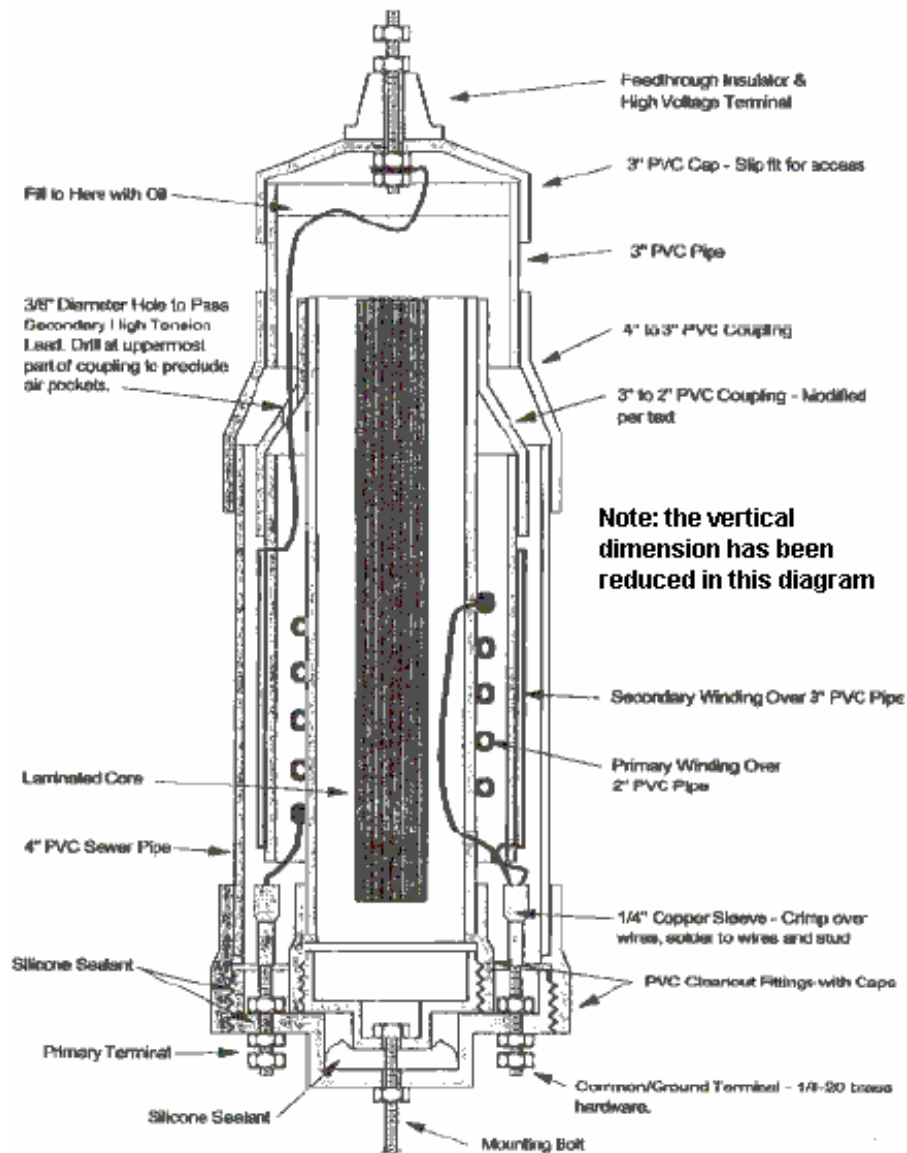
1. Decide frequency. Considerations are: (economy of size)
 - a. Use radio frequency upward (above 20,000 Hz).
 - b. Use natural frequency (coils have both capacitance and inductance), that is match the wire length of the wire in the coil to the desired frequency.
 - c. Wire length is either one quarter, one half or full wave length.
 - d. To obtain the wire length (in feet) use the following: If using one quarter wave length divide 247 by the desired frequency (megahertz range is desirable). If using one half wave length divide 494 by the desired frequency. If using full wave length divide 998 by the desired frequency.
2. Decide number of turns, ratio of increase in number of turns sets the function. In the case of the L-1 coil, each turn divides the input voltage by the number of turns. In the case of L-2 coil, the resulting voltage in each turn of L-1 is induced into each turn of L-2, adding up with each turn. For example if the input into L-1 from a high voltage, low amperage module is 2,400 volts, and L-1, for example, has 10 turns, then each turn of L-1 will have 240 volts of magnetic induction which transfers 240 volts of electricity to each turn of L-2. L-2 may be one turn or many turns, such as 100 to 500 or more turns. At 100 turns, 24,000 volts would be produced. At 500 turns, 120,000 volts would be produced.
3. Decide the height and diameter of the coil system. The larger the diameter of the coil, the fewer turns are required, and the coil has a lesser height. In the case of L-2 this results in lowering the amplification of the induced voltage from L-1.
4. For example, if 24.7 MHz is the desired frequency output from L-2. One quarter wave length would be 247 divided by 24.7 which equals 10 feet of wire. The number of turns will be the amplification factor. The coil may be wound on standard size P.V.C. or purchased from a supplier. The supplier is normally a ham radio supply source. Once the length is determined and the number of turns decided, move to the next step. For example, let each turn of L-1 have 24 volts and desired output of L-2 be 640 volts. Therefore L-2 needs 26.67 turns. It has been determined that the wire length for one quarter wave length is 10 feet. The number of inches in 10 feet is 120. Using Chart "A" supplied look for next higher number of turns showing (being between 20 and 30 turns with a 2" diameter coil). This tells us to use a 2" coil. If ready-made as in the case of Barker and Williamson, 10 Canal Street, Bristol, Penna., 215-788-5581, the coils come in standard sizes of 4, 6 and 10 turns per inch. For higher "Q" use wider spacing of the turns. These coils come in a ready-made length of 10 inches. Select from the coil 30 turns and put input clamps on the base of the coil and at 30 turns. For exact determination of the correct position of the output clamp, use an externally grounded voltage probe. The node of maximum intensity, being the natural resonant point. Off the shelf multimeters are not radio frequency responsive. The easiest way to accomplish the above is to get from the hardware store or Radio Shack a voltage detector having a neon bulb system (Radio Shack Cat. No. 272-1100b, NE2-Neon Lamps) will work. With your hand as a ground, move the wire extension of the neon lamp along the coil surface until the neon is brightest. This is the desired point of resonance and it is the optimum connection point.
5. The input power now needs consideration. A 2,400 High Voltage module has been previously selected. This module can be made from a diode bridge or any combination of voltage amplifiers. The one used here is an off-the-shelf type, similar to those used for laser technology.

6. Construction of the input L-1 coil. It has already been decided that there will be 10 turns. The length of the wire here is not critical. Since the L-2 coil is 2-inches in diameter, the next off-the-shelf larger size may be used for L-1. Use a 3" diameter off-the-shelf coil which has 10 turns to the inch. Remove (cut) a 10 turn portion from the larger coil. Use an L.C.R. meter and measure the natural farads (capacitance) and henrys (inductance) values of the L-2 coil. Now do the same for the L-1 coil. It will be necessary to put a capacitor across the voltage input of L-1 in order to match the L-1 coil to the L-2 coil. A spark gap across L1 is also required to deal with the return voltage from L-1. A tuneable capacitor of the pad ("trimmer") type for L-1 is desirable.
7. The performance of the L-2 coil can be further enhanced by having an Earth grounding from the base of the coil. The maximum voltage output will be between the base and the top of the L-2 coil. Lesser voltages can be obtained at intermediate points along the length of the L-2 coil.

SUPPLY SOURCES

1. HAM RADIO SUPPLY STORES
2. COILS, AIR INDUCTOR IN HOUSTON
3. BAKER AND WILLIAMSON (READY MADE), BRISTOL. PENNA.
ALSO R.F. DUMMY LOADS AND WATTMETERS.

N O T E S



Impulse Transformer Assembly

ELECTRICAL PRINCIPLES: TERMINOLOGY & SAFETY

The use of electricity is so commonplace that most people assume that it will always be available on demand. To fully realize our dependence upon electricity, consider the ways in which electricity is being used each day in the home, on the farm and the ranch. Electricity is doing more to increase work efficiency and promote enjoyable living than any other single factor. The use of electricity has grown to the extent that an increasing portion of the home or business budget, is used in paying for this source of energy.

1. Definition of Electricity

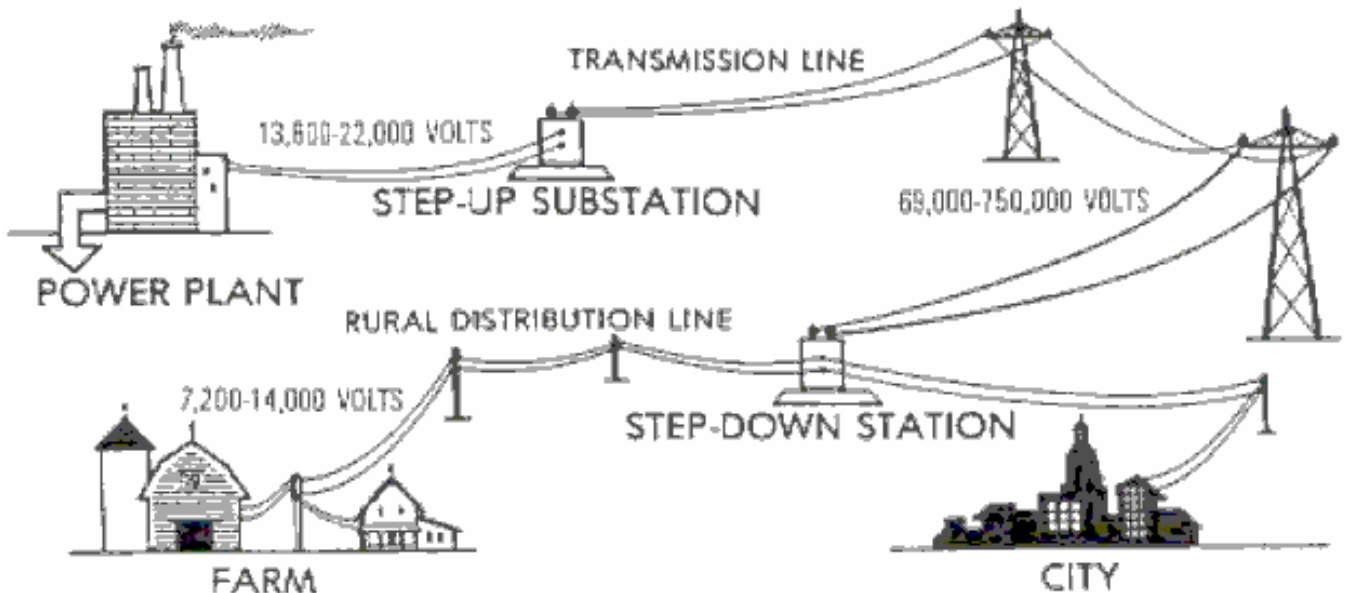
Electricity can be defined in several ways. The layman defines electricity as a source of energy that can be converted to light, heat, or power. Electrical Engineers define electricity as a movement of electrons caused by electrical pressure or voltage. The amount of energy produced depends on the number of electrons in motion.

2. The Manufacture and Distribution of Electricity

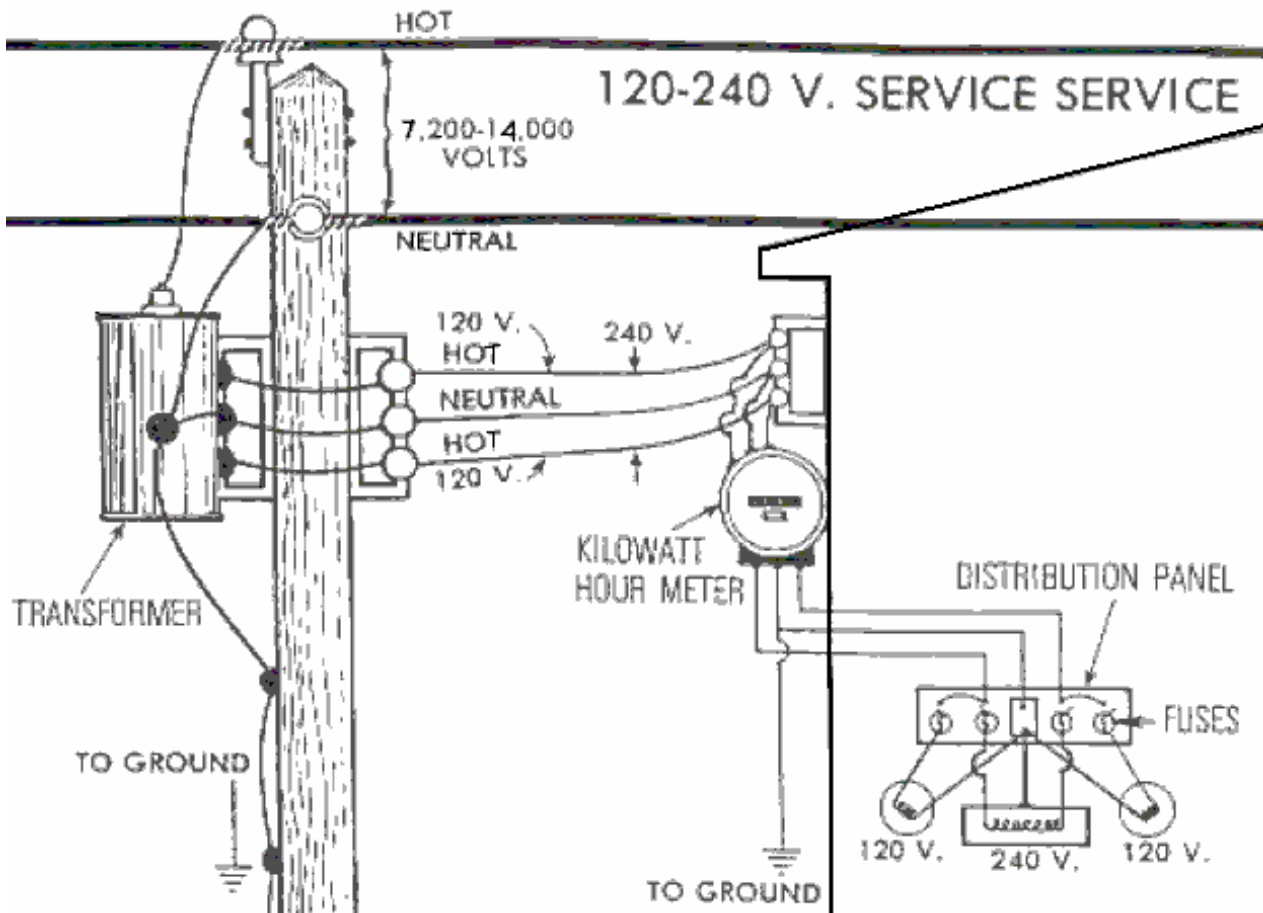
Electricity is produced from generators that are run by water, steam, or internal combustion engines. If water is used as a source of power to turn generators, it is referred to as hydroelectric generation. There are a number of this type located in areas where huge dams have been built across large streams.

Steam is used as a source of power for generating much of today's electricity. Water is heated to a high temperature, and the steam pressure is used to turn turbines which generate electricity. These are referred to as thermal-powered generators. Fuels used to heat the water are coal, natural gas, and/or fuel oil.

Generators at the power plant generate from 13,800 to 22,000 volts of electricity. From the power plant, electricity is carried to a step-up sub-station which, through the use of transformers, increases the voltage from 69,000 to 750,000 volts. This increase in voltage is necessary for the efficient transmission of electricity over long distances. From the step-up sub-station, the electricity is carried on transmission lines to a step-down sub-station which reduces the voltage to 7,200 to 14,000 volts for distribution to rural and city areas.



Transformers at the business or residence reduce the voltage to 120 or 240 volts to supply the meter of the customer:



3. Common Electrical Terms

In order to work safely and efficiently with electricity and have the ability to converse on the subject, the following terms should be understood:

Ampere (Amp) - A measurement in units of the rate of flow of electrical current. This may be compared with the rate of flow of water in gallons per minute.

Example: A 60-watt incandescent lamp on a 120V circuit would pull 1/2 ampere of electricity (60 divided by 120 = 0.5 or 1/2, Formula: $\text{Amperes} = \text{Watts} / \text{Volts}$)

Volt (V) - A unit of measure of electrical pressure. A given electrical pressure (V) causes a given amount of electrical current (Amps) to flow through a load of given resistance. Voltage may be compared to water pressure in pounds per square inch in a water system. Common service voltages are 120 volts for lighting and small appliance circuits and 240 volts for heating, air conditioning, and large equipment circuits.

Watt (W) - A unit of measure of electrical power. When applied to electrical equipment, it is the rate that electrical energy is transformed into some other form of energy such as light. Watts may be compared to the work done by water in washing a car. (Formula: $\text{Volts} \times \text{Amps} = \text{Watts}$)

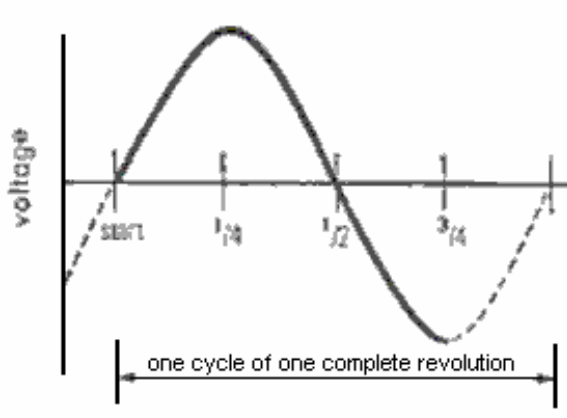
Kilowatt (KW) - A unit of measurement used in computing the amount of electrical energy used. Kilowatts are determined by dividing the number of watts by 1000 as 1 kilowatt = 1,000 watts.

Kilowatt-Hour (KWH) - A measure of electricity in terms of power in kilowatts and time in hours. One KWH is 1000 watts used for one hour.

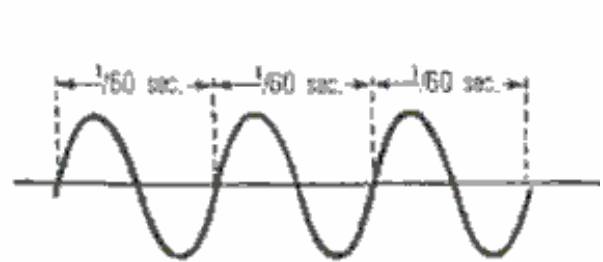
Alternating Current (A.C.) - Electrical current that alternates or changes direction several times per second. The direction current moves depends on the direction in which the voltage forces it.

Cycle - The flow of electricity in one direction, the reverse flow of electricity in the other direction, and the start of the flow back in the other direction. The cycles per second are regulated by the power supplier and are usually 60 in America. Most electric clocks are built to operate on the mains frequency. More or fewer cycles per second would cause mains-operated clocks to gain or lose time. The present practice is to use the term Hertz (Hz) rather than "cycles per second".

GENERATION OF ALTERNATING CURRENT

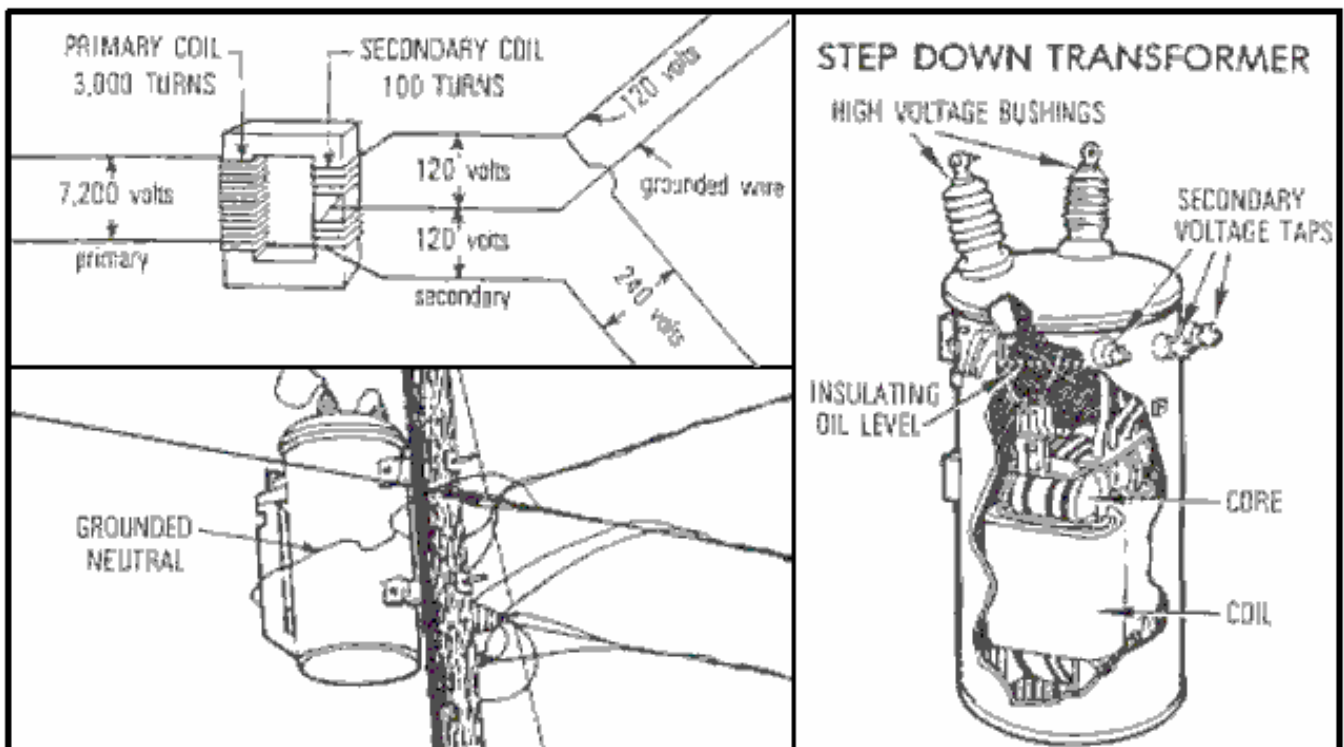


SINGLE-PHASE 60-Hz ALTERNATING CURRENT



Direct Current (D.C.) - Electrical current flowing in one direction. Example: electrical circuits in automobiles and tractors.

Transformer - A device used to increase or decrease voltage.



Single Phase - The most common type of electrical service or power available to consumers. One transformer is used between the distribution line and the meter. Usually

three wires, two "hot" and one neutral, are installed to provide 120V and 240V single-phase service. Single-phase service may also be supplied with a three-phase service.

Three-Phase - This type of service is designed especially for large electrical loads. It is a more expensive installation due to three wires and three transformers being required. The important advantage of three-phase power is that the total electrical load is divided among the three phases, consequently, the wire and transformers can be smaller. Other advantages exist in the design of three-phase motors.

Short Circuit - A direct connection (before current flows through an appliance) between two "hot" wires, between a "hot" and neutral wire, or between a "hot" wire and ground.

Voltage Drop - A reduction of current between the power supply and the load. Due to resistance, there will be a loss of voltage any time electricity flows through a conductor (wire). Factors that influence voltage drop are size of wire, length of wire, and the number of amps flowing. A drop in voltage may cause a loss of heat, light, or the full power output of a motor. It could cause motor burn-out unless the motor is properly protected (time-delay fuse).

Fuse - A device used to protect circuits from an overload of current.

Circuit Breaker - A device used to protect circuits from an overload of current. May be manually reset.

Time-Delay Fuse - A fuse with the ability to carry an overload of current for a short duration without disengaging the contacts or melting the fuse link.

Horsepower (hp) - A unit of mechanical power equal to 746 watts of electrical power (assuming 74.6% electric motor efficiency). Motors of one horsepower and above are rated at 1000 watts per hp while motors below one horsepower are rated at 1,200 watts per hp.

Conductor - The wire used to carry electricity (typically, copper or aluminum). Copper and aluminum should not be spliced together due to their incompatibility resulting in deterioration and oxidation.

Insulator - A material which will not conduct electricity and is usually made of glass, Bakelite, porcelain, rubber, or thermo-plastic.

"Hot" Wire - A current-carrying conductor under electrical pressure and connected to a fuse or circuit breaker at the distribution panel. (Color Code: usually black or red)

Neutral Wire - A current-carrying conductor not under electrical pressure and connected to the neutral bar at the distribution panel. (Color Code: usually white)

Grounding - The connection of the neutral part of the electrical system to the earth to reduce the possibility of damage from lightning and the connection of electrical equipment housings to the earth to minimize the danger from electrical shock. (Color Code: Can be green or bare wire).

Underwriters' Laboratory (U.L.) - An American national organization which tests all types of wiring materials and electrical devices to insure that they meet minimum standards for safety and quality.

National Electric Code (N.E.C.) - Regulations approved by the National Board of Fire Underwriters primarily for safety in electrical wiring installations. All wiring should meet the requirements of the national as well as the local code.

4. Computing Electrical Energy Use and Cost

If an estimate of cost for electricity used is desired, the name plate data on appliances and equipment and an estimate of operating time may be used. The following formulas should be used for determining watts, amps, volts, watt-hours, kilowatt-hours, and cost.

$$\text{Watts} = \text{Volts} \times \text{Amperes}$$

$$\text{Amperes} = \text{Watts} / \text{Volts}$$

$$\text{Volts} = \text{Watts} / \text{Amperes}$$

$$\text{Watt-Hours} = \text{Watts} \times \text{Hours of operation}$$

$$\text{Kilowatt-Hours} = \text{Watt-Hours} / 1000$$

$$\text{Cost} = \text{Kilowatt-Hours} \times \text{Local Rate per Kilowatt-Hour (or per "Unit")}$$

Example:

Local electricity rate per Kilowatt-Hour: 8 cents

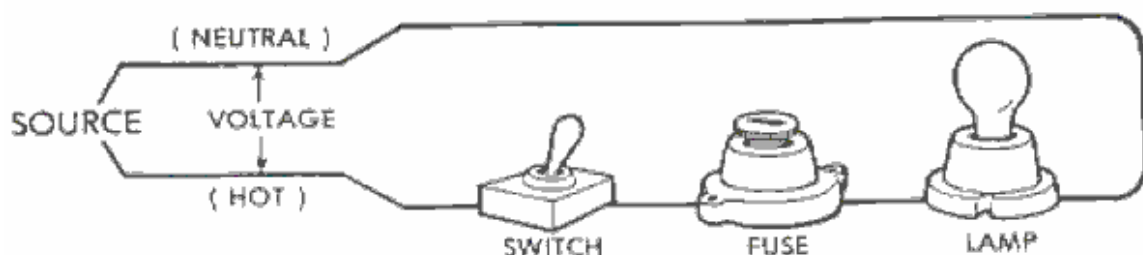
Equipment plate data: 120 Volts 5 Amps

Monthly hours of operation: 10

1. Watts = Volts x Amperes, so Watts = $120 \times 5 = 600$ watts
2. Watt-Hours = $600 \times 10 = 6,000$ watt-hours
3. Kilowatt-Hours = $6,000 / 1,000 = 6$ kilowatt-hours (or 6 Units)
4. Cost = $6 \times 8 = 48$ cents

5. Electrical Circuits

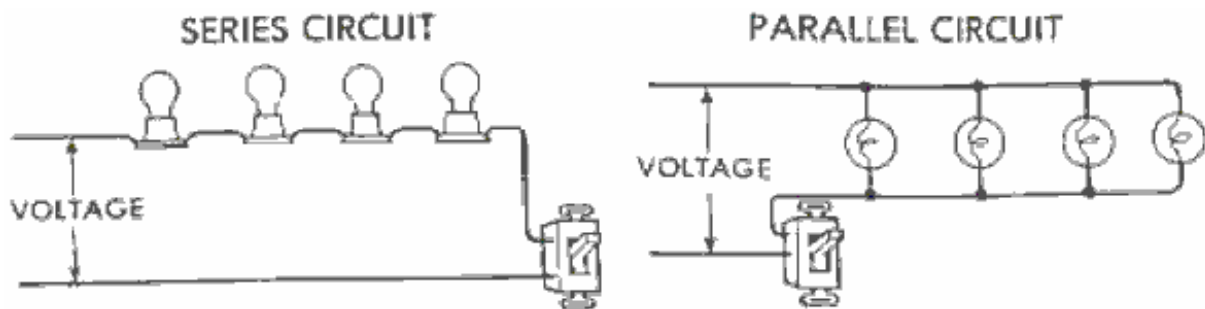
An Electrical Circuit is a completed path through which electricity flows. Insulated conductors (wires) provide the path for the flow of electricity. A water system and an electrical circuit are similar in many respects. Water flows through pipes and is measured in gallons per minute, and electricity flows through conductors and is measured in amperes. A simple circuit is shown here:



A circuit includes a "hot" wire (red or black) carrying current from the source through a switch, circuit protector (fuse or circuit-breaker), and an appliance. The neutral wire (white) conducts the current from the appliance to the source (ground).

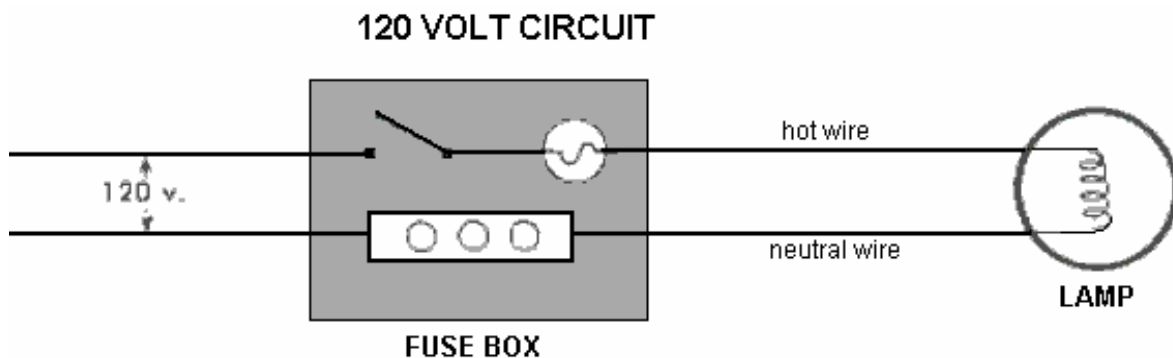
There are two methods for connecting devices in a circuit - "in series" or "in parallel". In a series circuit, all of the current must flow through each device in the circuit. Removing any one of the devices in a series circuit will stop the flow of current. In parallel circuits, the load (lights or appliances) are connected between the two wires of the circuit providing an independent path for the flow of current, and removing a lamp has no effect on the other lamps in the circuit.

Switches, fuses, and circuit breakers are always connected in series. In most cases, except for some Christmas tree lights, appliances and lights are connected in parallel.

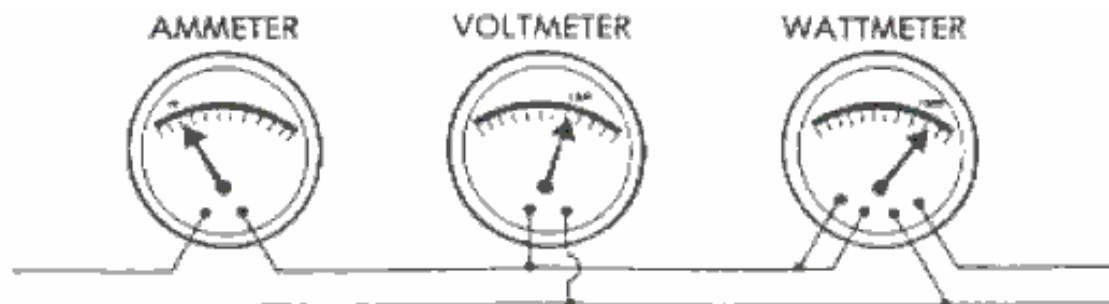


6. 120 Volt and 240 Volt Circuits

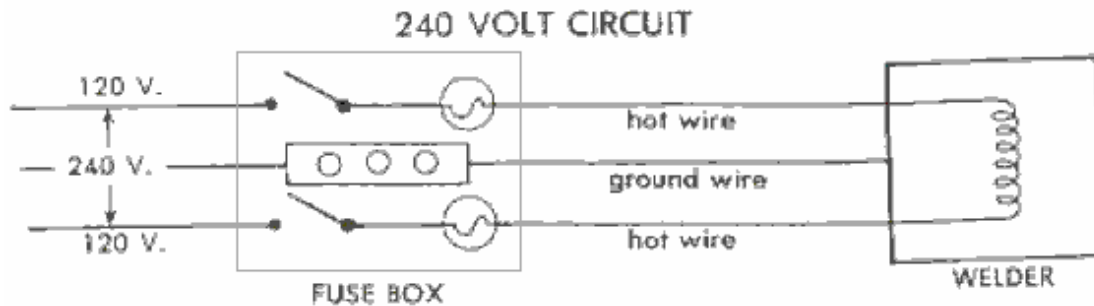
The 120V circuit has one "hot" and one neutral wire, with the switch and circuit protector in the hot line. The neutral wire from the appliance is connected to the neutral bar in the fuse or breaker box. For safety, the neutral wire should never be broken or interrupted with a switch or fuse.



The voltage in a 120V circuit is measured with a voltmeter with one lead on the hot terminal and the other lead on the neutral bar. The number of amperes flowing may be measured with a clamp-on ammeter by encircling the hot or neutral wire with the jaws of the ammeter.



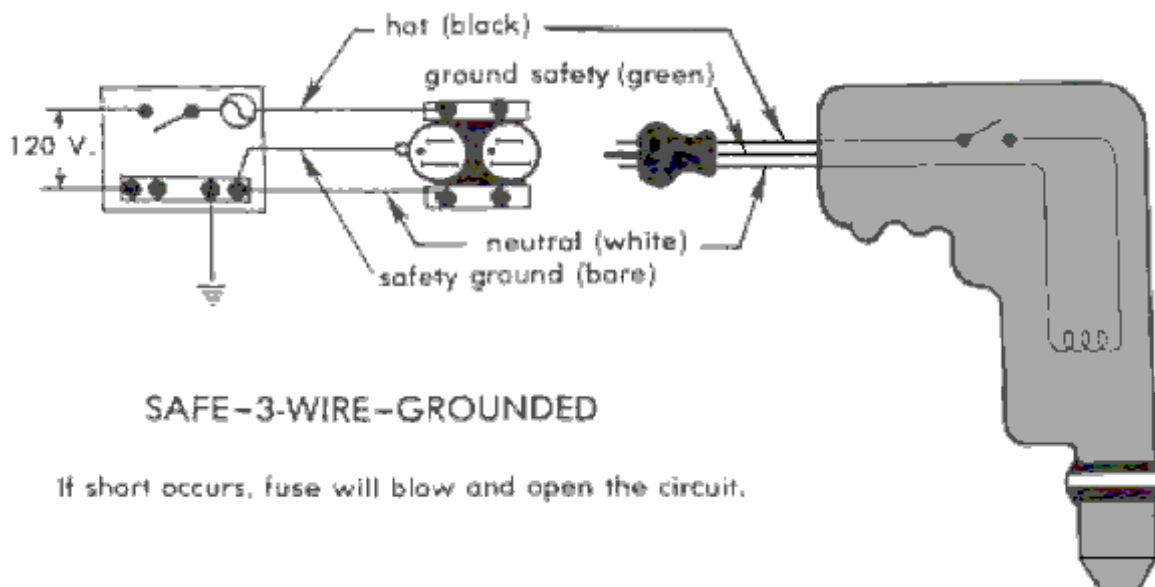
The 240V circuit has two hot wires and one safety-ground wire. Switches and fuses are installed in the hot lines. The two hot wires are necessary for the operation of 240V welders and motors. The safety-ground wire, connected to the metal frame of the equipment or motor and to the neutral bar, does not carry current unless a "short" develops in the motor or welder. If a short should occur, one of the circuit protectors will burn-out or open, thus opening the circuit.



The voltage on a 240V circuit is measured by fastening a lead on the voltmeter to each of the hot wires. Voltage between either hot terminal and the neutral bar will be one-half of the voltage between the two hot wires. The number of amperes flowing can be measured by clamping an ammeter around either of the hot wires.

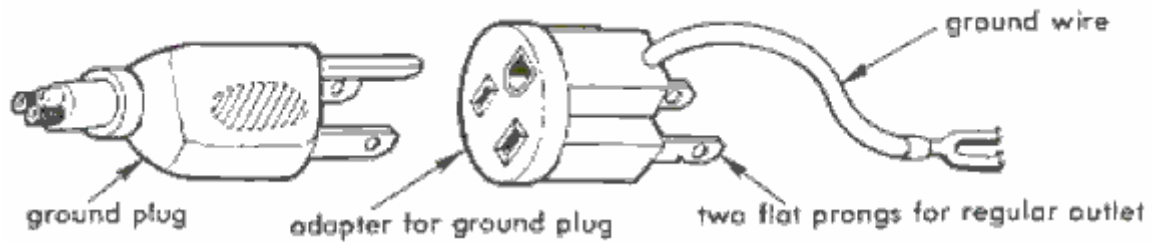
7. Safety Grounding of Electrical Equipment

Refer back, to the 240V circuit and note the ground wire from the metal frame to the neutral bar. The following illustration shows proper safety grounding when operating a drill in a 120V circuit. The safety-ground wire may be bare, but a three-wire cable is recommended. Safety-ground wire in three-wire cable is usually green in color. A current-carrying neutral wire should never be used for a safety-ground. Likewise, a safety-ground wire should never be used as a current-carrying hot or neutral wire.



Using grounded receptacles and a safety-ground on all circuits will allow the safety-grounding of appliances when they are plugged into the outlet. An adapter must be used to properly ground appliances connected to receptacles which are not safety-grounded. If an adapter is used, the green pigtail wire must be connected to a known ground to give protection from electrical shock should a short-circuit occur.

GROUND PLUG AND ADAPTER



A test lamp can be used to check a circuit completed between a "hot" wire and a neutral wire. Use the test lamp to check appliances for shorts. With the appliance plugged into an outlet, touch the appliance frame with one lead of the test lamp while the other lead of the test lamp is grounded to a water or gas pipe. If the test light does not burn, reverse the appliance plug and check with the test lamp again. If the light burns, a short exists (the hot wire is touching the frame of the appliance). Unplug the appliance and repair or discard it.

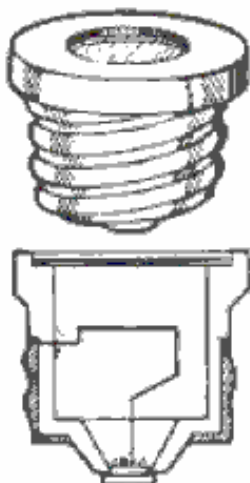
8. Electrical Circuit Protection

Electrical circuits should be protected from an overload of amperes. Too many amperes flowing through an unprotected circuit will generate heat, which will deteriorate or melt the insulation and possibly cause a fire. The number of amperes that a given conductor can safely carry, depends upon the kind and size of wire, type of insulation, length of run in feet, and the type of installation. Charts are available in reference texts giving allowable current-carrying capabilities of various conductors.

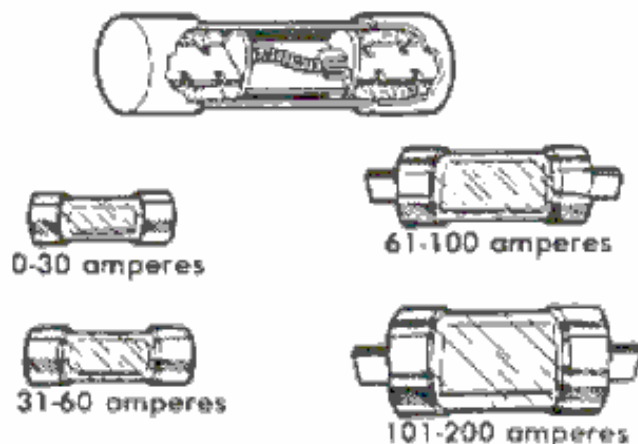
The four types of circuit protection are: common fuses, fuse-trons (time-delay), fustats (two-part time-delay), and circuit-breakers. Fuses are of two basic types: plug, and cartridge.

Common fuses contain a link made from a low-temperature melting alloy which is designed to carry current up to the rating of the fuse. Current higher than the amperage rating causes the link to heat above its melting point. When the fuse "blows", the link melts and opens the circuit.

PLUG TYPE FUSE

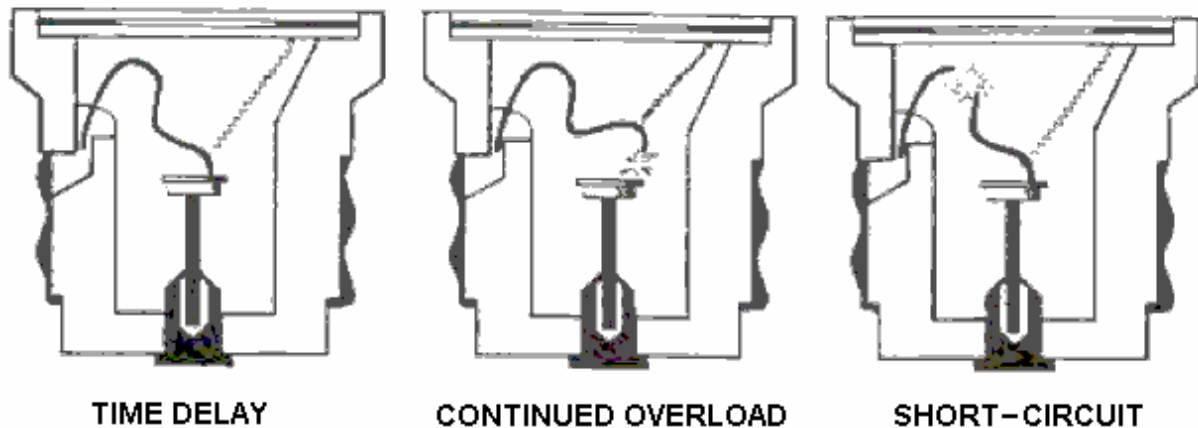


CARTRIDGE TYPE FUSE



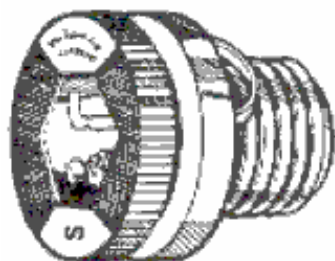
Fuse-trons (time-delay fuses) are made to carry a temporary overload, such as the overload caused by the starting of an electric motor. The fuse, however, still provides protection for the circuit, and a short-circuit will melt the fuse link. If a common fuse is used, the fuse link will melt every time an electric motor starts. The use of a larger ampere common fuse will prevent the "blow" resulting from the temporary overload, but will not provide protection for the motor or the circuit.

OPERATING PRINCIPLE OF DELAYED ACTION FUSE

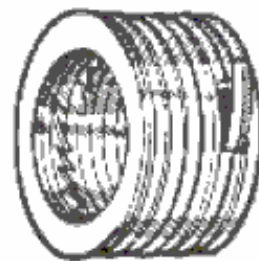


Fustats, non-tamperable fuses of the time-delay type, have a different size base and require a special adapter which is screwed into the standard fuse socket. After the adapter is installed, it cannot be removed. For example, the installation of a 15-ampere adapter allows only the use of 15-ampere or smaller fuse.

FUSTATS



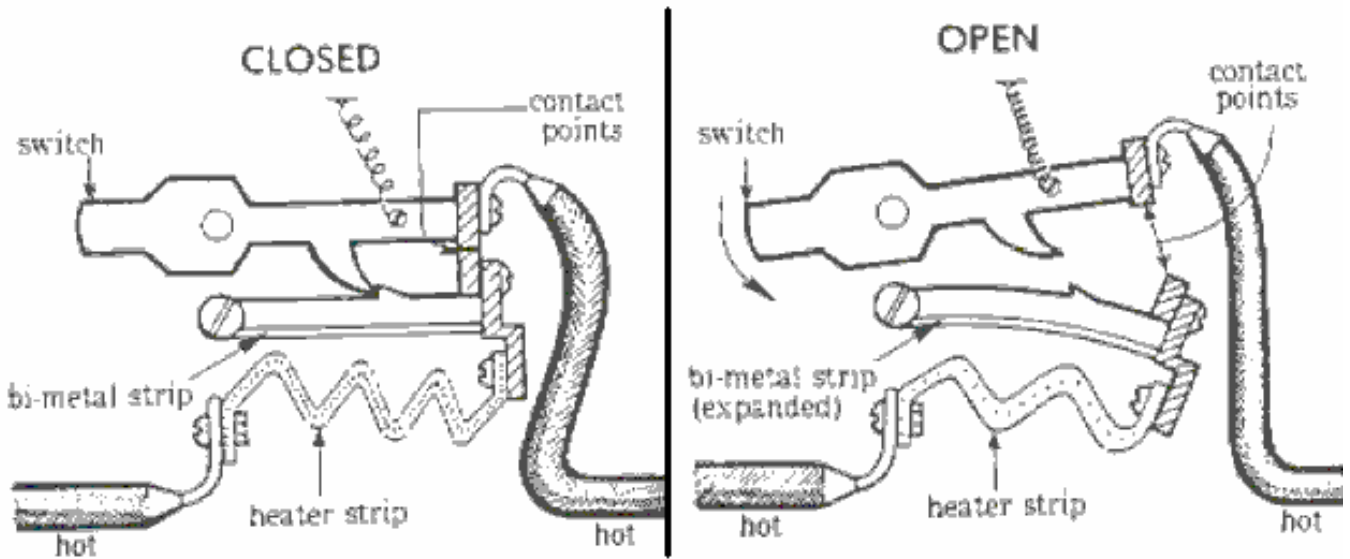
FUSE



ADAPTER

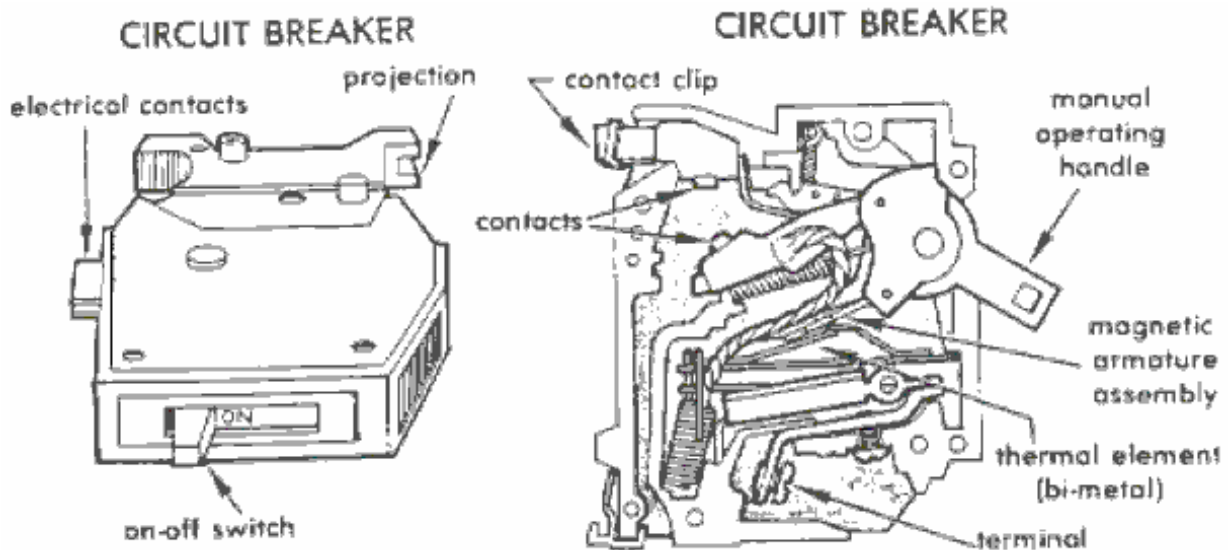
Circuit breakers eliminate the replacement of fuses and are commonly used even though a circuit breaker box costs more than a fuse box. Circuit breakers are of two types, thermal and magnetic. The thermal breaker has two contacts held together by a bi-metal latch. A current overload causes the bi-metallic strip to become heated, the latch releases, and the points spring open. After the bi-metallic strip cools, the switch is reset and service is restored.

CIRCUIT BREAKER OPERATION



The magnetic breaker has contacts that are held together by a latch which is released by the action of an electromagnet. The amount of current flowing through the circuit will determine the size of the electromagnet. This type of circuit-breaker is reset by moving the toggle switch to the "on" position.

The following diagram shows the parts of a circuit breaker.



9. No Fault Grounding

Fuses and circuit-breakers are safety devices which limit current (amperage) in a circuit. Their main function is to protect equipment and wiring from overload. Ground fault circuit interrupters (GFI) are designed to protect humans, equipment, and/or electrical systems from injury or damage if electricity flows in an unintended path (a short-circuit).

A GFI is a very sensitive device that functions by comparing the current moving in the "hot" wire with that in the neutral wire. If these two currents are not equal, a fault exists, and current is "leaking" out of the circuit. If the difference in current between the two wires is 5/1000 of an ampere or greater,

the GFI will open the circuit, shutting off the power and eliminating any shock hazard.

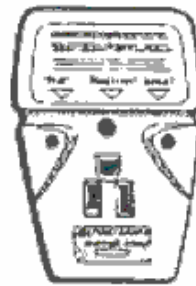
The National Electrical Code requires GFI's for all 120V, single phase, 15 and 20 amp receptacles installed outdoors, in bathrooms, and in garages for residential buildings. A GFI is required at construction sites and some other applications. After correcting a circuit fault, the GFI may be reset for further use.

A variety of GFI equipment is made for 120 and 240 volt circuits:

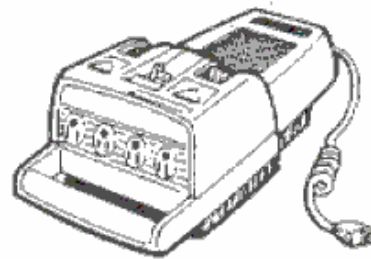
GFI RECEPTACLE FOR
CONVENTIONAL OUTLET



reset and test buttons



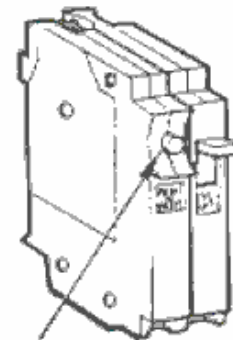
PORTABLE GFI TO PLUG INTO OUTLET



GFI TO INSTALL IN
BRANCH CIRCUIT



GFI TO REPLACE
CIRCUIT BREAKER



test button

REFERENCES:

COOPER, ELMER L., *AGRICULTURAL MECHANICS: FUNDAMENTALS AND APPLICATIONS*. DELMAR PUBLISHERS INC., ALBANY, NEW YORK

ELECTRICAL WIRING - RESIDENTIAL, UTILITY BUILDINGS, SERVICE AREAS, AAVIM, ATHENS, GEORGIA.

Note: This electrical information does not apply directly to areas outside America and local regulations for electrical supply should be checked.

Note: A considerable amount of extra information on Don Smith's work and devices is available in:

<http://www.free-energy-info.com/Chapter3.pdf> and <http://www.free-energy-info.com/Chapter5.pdf>