

Stationary Field Generators
a blue print for a new energy technology
\$35.00 Lab Note Book with Floppy Disc

A Technology Conceived Of By
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*"...the science of things never dreamed of...."
and purely so*

"Level of this technical paper"
Technical Grade:
Associate Degree Level Discussion
* * *

Minimum Skill Level:
Associate Degree,
First Year Student
* * *

"Electronics Concepts Levels Herein"
Basic Fundamentals of Ohm's Law
And Kirchoff's Principles
Basic Circuit Design and Analysis
Discussions Requiring:
Basic Knowledge Of Electronic Vacuum Tubes
* * *

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This technical trade paper is written as a lab and research
reference manual for use in the basic study and
research of SFG sciences.

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* "In A Nut Shell"

Herein, I would say here that my view is a "relativistic" view and that should be enough to spark curiosity. Relativity is merely the observation of things from another vantage of view. Hence things are thus "relative" to that vantage. Thus, from another vantage point we may obtain a three dimensional view or a four dimensional view of the workings of things and thus make a re-application of known text book principles from that new vantage towards a newly realized objective and, not violate any of the laws of physics. Our views are thus divided between two vantages in physics, the classical physics view (Newtonian) and the relativistic view or non classical views (Einstein).

There is much talk of such things as zero point energy and over unity devices. I really can't say much about that since my device does not fall into those categories. I can say this, *I have found a way to use the forces of electricity generated from a stored charge to do work by way of field forces, that work at a distance: to move electrons elsewhere into current flow to do work. And thus, I do not "physically" use the stored energy charge itself, as we conventionally do now in all our current electrical power generation schemes. (Please read this paragraph again carefully if you are not certain of what was just described. Comparing a stored charge to generated charges.)

This means that I do not use the energizing charge as a means of stored electron current flow. I use the forces generated by that energizing charge to move electrons elsewhere into current flow and thus I do not deplete my stored charge as we would in the case of a battery or via a stored capacitor charge that is discharged through an external load. The Chief Technical Advantage here is that "we do not deplete our energy charge" since we do not physically use it. Instead, we use the electrical field forces that the electrons in our stored charge exert, to move electrons elsewhere by means of the principles of like and unlike electrical charges which can pull or attract if they are unlike, or, push or repel if they are like in electrical polarity.

Hence upon close examination this is not something that violates the law of the conservation of energy. It is merely a re-application of known text book principles into an objective scheme of operation. Basically it is very simple in nature to implement and use. And "it should be simple" and not at all complicated.

I hence named the technology a "stationary field generator." I also view this as a type of energy processor. Or a dry charge generator, etc. A kind of electrostatic field force generator. Which is non electromagnetic and non electromechanical. Hence: solid state and direct current in nature.

So the principle is this in a nut shell, I have a stored charge that I use as my energy source such as a charge we have in a battery and exactly like that in reality, however I do not use those electrons in that charge as my current source. Instead, I allow the electrical field forces they perpetually generate to do the work of exerting those fields upon "other electrons" to move them to a point of excess accumulation and then, exit, at a terminal through an external load such as a lamp or radio. Simple.

There are no AC currents involved, it is all DC in nature and all the parts I need are **electrolytic capacitors** for the stored charge and voltage divider applications and **semiconductor diodes** to direct my generated up current to the external load. Hence as I said earlier *I can show you something perfect*. Also, purely simple.

The previous descriptions define the principles behind and leading into the topic that is known as The Proof of the Principle.

Amazingly, this also works at high voltages with **vacuum tube diodes** as well as diode like voltage regulation vacuum tubes. You can also replace one diode with a **triode** with signal applied and create a 60 Hz signal voltage scheme.

The energy balance is such that there is allot of energy stored in the energizing charge of which we obtain our electrical field forces from, to do work, and the generated charge is much less in comparison. The energizing charge hence is the source of energy, yet, unlike other generation schemes such as the battery where we use that stored charge as our source of electron current, we do not do so in this scheme; instead we use the field forces that the electrons in the charge are forever generating. Again the Chief Technical Advantage of this technology is: we do not deplete our energy source. There are in reality some losses, and we shall learn to calculate them later herein.

(We store the charge in voltage divider capacitor networks which will give us both a negative ground potential and a positive above ground potential so that we have both types of charges to do work with. Our objective then is to merely use the positive potential forces to attract up a flow of electrons from ground potential to a place in the scheme of excess electron accumulation and deposit, where we have created a negative potential reservoir of charge for exit to a device we wish to power.)

The manipulated up charge is an electron charge taken from the ground buss and not from the power supply that gave us the energizing charge. We must keep the idea of the greater amount “energizing” electron charge and the “manipulated up” charge separate in the view to analyze them in contrast: in order to understand and be able to work with the idea herein. Thus the stored charge and the manipulated up charge are not one and the same in source but separate. The only link between them is the “field forces” of the stored charge that attracts up the manipulated up charge.

If you like you can view the field forces of this scheme as being analogous to the field forces in an electromagnetic coil/magnet type of generator, except the field forces are electrostatic here and not magnetic. Hence we have energy, force and the movement of electron masses as the components of the “work equation.”

Basically the views here are well developed even down to the mathematical equation terms involved for analysis and design which means we can easily tweak any parameter and study its resultant effect. I however have defined a *standard whereby we can begin to study and to compare things and this standard is merely a *statistical mean that I have chosen based upon capacitor charge time constants which reflects upon the comparative electron charges involved, hence we can solve for things such as internal resistance of the generator etc.

The math involved is basic and somewhat easy, only repetitive in nature from branch to branch in the circuit. The energy balance equations on the other hand get a little deep and are thus for consideration by engineers looking for further insight. This involves converting electronics terms such as voltage and charge into terms such as Newtons of force and energy in terms of joules. Anyone can take it even further and translate this into dyne's as well as ergs however this is not needed since our main view here is that of force in Newtons and the resultant moved electron current (mass) in terms of joules per second which is equivalent to watts. (For the most part the voltage unit view is equivalent to force in terms of potential and electromotive force or emf.) Hence we can mostly concentrate on voltage and charge herein for any view we desire. We can easily convert voltage and charge into Newtons or joules terms. (The energy balance can be reduced down to a basic ratio which is defined by the previously mentioned *standard which will more specifically define the ratio of stored energizing charge to the value of charge generated into current flow. The source of energy always being greater than that generated, and thus, not in violation of the law of the conservation of mass energy.)

Advantages of the simple design include self regulation (control) of the output voltage over a wide range of load current. We can predetermine the output voltage via initial design and thus also predetermine the maximum load current and hence the internal resistance of the generator. Hence, all is well developed at this current time. And yet further study needs to be done to fine tune the parameters for further perfection of the design. Technically it is all ready to go at this moment for anyone who wishes to begin to practically implement this technology.

Since the test bench device is fairly inexpensive to build, numerous devices designed for different power levels can be cheaply built and studied. The overall cost of finalizing the research hence is not in the order of the cost of most research and development projects. And as far as manufacturing goes, all that we are looking at here are circuit boards that contain numerous capacitors and diodes, we may add in voltmeters and amp meters likewise. There hence are no manufacturing neither any technological barriers to bringing this technology to market under the current state of the art in manufacturing (and in terms of electronic components currently available). Anyone who understands electronics and the components of such, will realize that with the previous small list of parts that I have mentioned: that this lack of barriers is true in terms of implementing the technology. Hence, no state of the art or technological barriers.

Only some brief but concentrated study of this technology as a course with some practical hands on experience and then some considered designs as well as set up can make this a marketable technology easily within a year at most any location ready to handle any new electronic fabrication involving only a circuit board, a panel meter , a few switches, input/output terminals and a cabinet enclosure. Other designs for on board inclusion in devices such as computers, radios, utility lamps etc can come later.

Experimentation with vacuum tube diode versions by numerous hobbyist can lead to some innovative circuits being developed and much will hence be learned about the SFG Science (as we will call it here.) Only those familiar with high voltage and audio frequency amplification should experiment with this. "Dangerous high and even lethal voltages:" will be encountered with the vacuum tube diode versions. "Caution!" At your risk.

*Backgrounds

Electrons are a “mass” of energy. Although they are quantities of energy bundled together, they have the inertial property of dense matter, hence they exhibit mass. (The inertia of the energy mostly acts like centrifugal inertia.) Each electron spins and thus creates an electromagnetic field: where the energy bundle is caused to generate via radiation, an electromagnetic field force. Electrons hence are electrical field force generators that perpetually spin. We can call them a kind of perpetual energy generator, lacking the counter force of any friction. {In generation of energy on an eternal time scale of measure hence perpetual.}

In a certain electronics handbook of renown, I read that “electronics is the science of the manipulation of the electron and its control.” I also read therein that “energy was the accomplishment of a wave of motion, even through empty space (vacuum): without the means of matter.” Hence the wave motion is without any matter traveling through space with it. This means also that since no matter is involved in a wave motion of energy that the wave can penetrate matter. Energy quanta = 1 photon mass

These are the backgrounds views of electronics and these views are serious scientific views in the fields of physics and the use of energy. In the background of electronic formulas and the various units are the concepts of mass and energy as well as rate of time. We can hence drop back in view and convert all of our values to Newtons of force, joules of energy and electron mass numbers in coulombs of charge. Time unit is: either in radial velocity energy (or periodic in nature): including electromechanical and electromagnetic resonances. If we see it all this way for a moment, we are hence looking at electronics in terms of mass, energy, wavelength, and force, as well as time and distance. We also, normally think in terms of heat energy dissipation via the component mass, at certain wattage levels. (Hence the physics behind the mere basics of electronics is a whole science in itself before we read basic electronics and move on to learn about circuit design.) The previous view explained further: gets us to looking at doing work with force.

In such things as electric motors we convert watts into horsepower via 746 watts = 1 horsepower. This is an electromechanical equivalent. Here is a view where we convert energy to mass terms (one horse) to define mechanical force exerted on mass. The motor, an electromechanical device, exerts mechanical force on mass to move it.

* Voltage is a unit of “graduated field potential” that is referred to as potential and electromotive force or emf. It is thought of as the force behind moving a mass of electrons into current flow. “The unit of voltage however: does not define the force in Newtons terms.” Voltage however is used in the figuring of the voltage with the charge (electron mass in units of coulombs) to obtain the force in Newtons. A voltage difference hence, does indicate at all times, a “field force potential” calculable in Newtons. The field forces are either of the positive polarity kind or of the negative polarity kind and they can move mass all on their own without mechanical help. Example: static electricity is able to move objects as well as shock people.

As a “graduated” field potential, the voltage also has a value at certain points in space away from the source. Hence units of: micro volts per meter.

For the most part, the voltage definition of the previous paragraph is the most important concept to refer back to in the study of the herein sfg devices. To accomplish our objective we hence do not have to always be looking at the work we are attempting to do in Newton terms, since as previously mentioned we can look at it all in voltage terms for the most part, and then calculate the force in Newtons if we so choose.

Hence for the engineer's view, yes this is real serious science. However remember this, it is purely simple. We do not have to be complicated about it all after we learn it, for when once learned, it is easily comprehended thereafter and hence allot of exploration is before you once you learn the sfg device.

In this text you will not have to worry about becoming refreshed in the basic math ideas if you are not currently using them in your electronics endeavors since those items are picked up as we come to them and then examples are worked. Just look at this volume at times as you would a typical study text book. Focus on the circuit principles and then the math and that is how we shall do it herein. You shall first comprehend: based upon your past training; and then formulate. Comprehend and then formulate. Remember that, and you shall have it worked out before long.

In this small technical volume I hope you will come to say *"I have seen something, I would had never conceived of or had counted on ever seeing!"* I believe you will be thankful you read this paper. And I hope in the few pages that you have read so far that you have already seen several notable and curious things, and so, may you be inspired herein!

If you have your clip board, pen, paper and a notebook, as well as your favorite calculator then you are ready.

You will need to review the Quantities or Units Table and its basic math formulas for reference and, review the terms of the nomenclature for a little background as you proceed into the circuit study. The study will begin with the example of a typical vacuum tube diode for our first example of the sfg device principle. Then that view will be converted to an equivalent circuit example using solid state devices. That later example will be the device circuit which is made up of mere electrolytic capacitors and semiconductor diodes.

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*Fundamental Units And Quantities

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“Units”

Nm = Newtons/meter = force

Q = charge in coulombs

j = joules = power (see definition) = kg m² / sec²

v = volts = kg m² / Q sec²

I = current in amperes A

μA = micro amperes

Ω = ohms of resistance R

C = capacitance in farads F or f

μf = micro farads

“Mathematical Expressions Used”

$E = v = I \times R = A \times \Omega = \text{Ohm's Law}$

$Nm = v^2Q = v^3C$

(a voltage difference indicates a “force” (Nm) between two nodes)

$j = vQ = v^2C$

$Q = vC$

$v = Q/C$

$C = Q/v$

“Quantities”

1 coulomb = 6.25 x 10 {to the 18th} electrons
(mass quantity)

1 ampere = flow of mass electron current equal to 1 coulomb per second

“Over View”

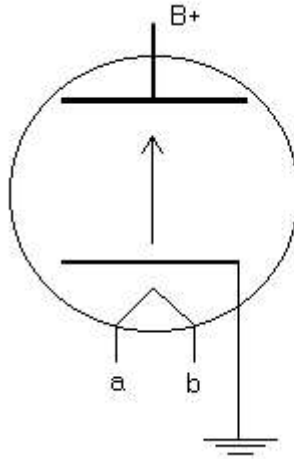
The sfg device is not a magical device that pulls energy out of thin air for it utilizes the associated electrical fields generated by stored charges that are initially stored in the capacitor component portions of the device to manipulate and control targeted electrons via positive and negative forces of attraction and repulsion. The power supply voltage must be maintained after initial charge up to hold up (as a reference) the field force at input and to maintain the equation $Nm = v^2Q = v^3C$ as well as to replenish small characteristic leakage current losses across the capacitor dielectrics. If the input voltage after initial charge up is removed, then v in the previous equation will be removed, and the equation collapses: that is to say, the “graduated force” is removed from the equation. “Explained herein this text.”

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*Vacuum Tube Diode Analogy

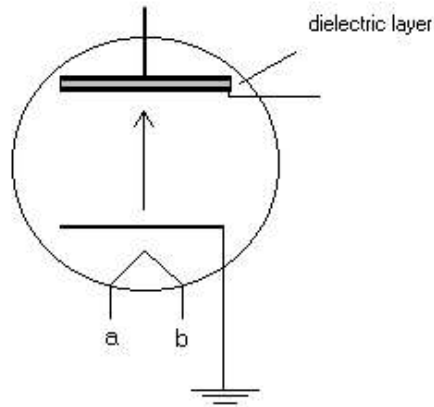
The study of vacuum tubes can provide us with a lot of insight into the ideas incorporated into the sfg devices. The principles of field forces along with the use of screens and grids situated in the vacuum tube are somewhat insightful.



schematic of a vacuum tube diode
- indirectly heated cathode type -
fig 1

Recall the nomenclature of the vacuum tube here. The diode contains the heated filament that heats the cathode which in turn boils off a space charge of electrons around the cathode. If a positive potential voltage (B+) is placed on the electron target plate (or simply plate) then the space charge electrons will be attracted to the plate by the principle of unlike charges attracting. Indicated by the unidirectional arrow. This is an example of the force of attraction which can be calculated in terms of Newtons per meter (N/m). We however will look at this in terms of voltage since voltage indicates an electromotive force or emf. Hence force or field potential can merely be looked at in terms of voltage in the basic since: micro volts/meter. (However our scale of magnitude of force here in the vacuum tube example is on the order of a few hundred volts and our practical sfg voltages herein, in solid state device terms, will be on the scale of volts.)

(Power in the sense of voltage times current and application can be deceiving if you are not following things closely. **One watt can produce enough heat to burn you if your device is made to efficiently produce heat.** Whenever you are measuring electrical fields in and around an antenna of a high powered broadcast station you use a meter on the scale of micro volts per meter. The scale of micro volts might seem small and somewhat strange when dealing with broadcast powers of 50,000 watts of rf energy. Here we are not looking at the current in the antenna which can be considerable. When we combine the value of the voltage with the current we obtain the power: $vI = W$ In the case of the antenna, it is the voltage across the input feed point times the current that matters, and not necessarily the field strength voltage measured with the micro volt meter. The micro volt meter gives us an idea of the pattern of radiation rather than the power. So your vantage of view herein this text, will have to be led by me if you wish to grasp this subject. Here we will be dealing with a scale of Newtons, not milli or micro Newtons. (A Newton is a large scale.)



Vacuum Tube SFG Device “Intellectual Property”
fig 2

The above modification to the vacuum tube diode may seem a simple thing and thus the idea of the SFG concept is really simple in application and should be so since we are dealing with basic fundamental electrical principles and forces as well as energies. Above, we have inserted a new electron target plate in the path of the electron flow to the main plate. The “accessory plate” is electrostatically coupled to the main plate (it is capacitively coupled to the plate.) A thin but strong “dielectric insulator” exist between the two so that the electrons that are attracted to the accessory plate are not allowed to flow to the main plate. The B+ positive potential force of the main plate is exerted upon the accessory plate making it look positive with respect to the cathode and thus it attracts cathode current.

The electrons attracted up to the accessory plate accumulate on the accessory plate at this point and have no place to go, however note: there is an attached electrode exiting the accessory plate through the tubes glass envelope.

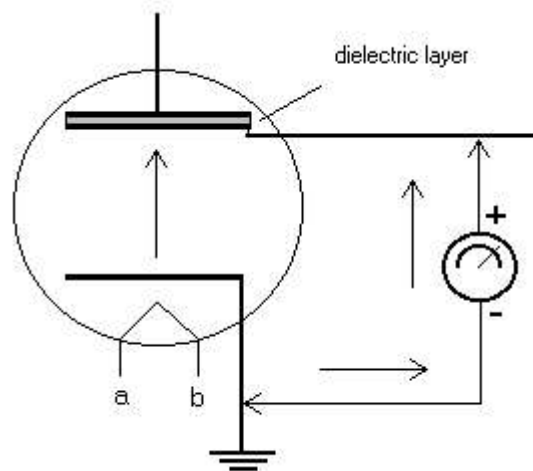
At this point we actually have an excessive accumulation of electrons on the accessory plate. By definition, an excessive accumulation of electrons at one point will make that point negative with respect to its counter point, however here, if we measure the exiting electrode's voltage with respect to ground potential we read a positive polarity voltage which is the normal case (figure 3.) Yet, we also know that there is an excessive accumulation of electrons on the accessory plate and thus somehow we may be able to make this point read negative if we can contrive a scheme to do so. How might we discover this negative polarity with respect to the excessive electron deposit or accumulation? Read this over again if you do not initially get the view here.

Does this seem impossible? Do you think it can be done however? Hum? Scratch your heads! Ponder for a moment the possibility.

When we place our positive electrode from our volt meter on the accessory plate electrode, electrons are attracted up through the negative meter probe from the ground, up through the meter to the positive potential of the accessory plate. The positive force of the accessory plate is greater than the force of the accumulated up electrons which normally want to repel away from each other and escape.

Notice that I said that the positive potential force of the plate is greater than the like charge forces of the accumulated up electrons. The electrons would normally want to repel away from each other, however, they are overcome by a stronger force which forces them to do what they normally would not do: which is to be made to exist physically close to each other, although they naturally would want to repel away from one another. If we can find a way to allow them to repel away from each other on the accessory plate, then we can get an exiting current flowing and, thus institute a kind of generator. Curious?

The answer of how to do this curious feat is actually simple. You, the tech, already know the answer but do not know you know it at this moment.



potential difference
fig 3

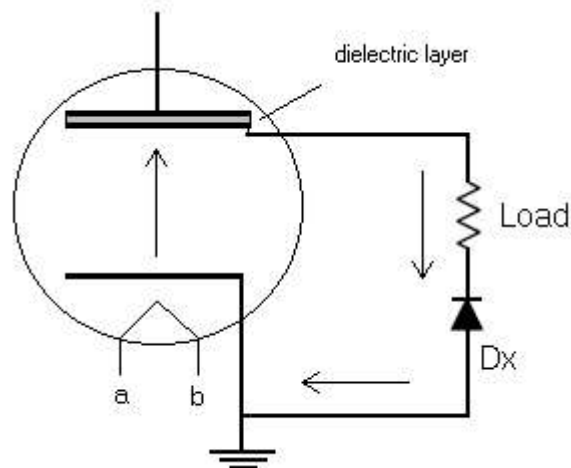
As previously discussed, the electron current is attracted from ground up through the meter to the positive potential of the accessory plate. The positive potential force placed on the attracted up electrons is greater than the force of the excess deposit of electrons on the accessory plate hence there is no chance for escape.

However: in Norton and Thevinim Theorem studies and networks, current is seen as being able to travel both directions at once in a conductor and one is said to buck or cancel out the other. Thus, if we could cancel out this directional flow of electron current through the meter from ground up to the accessory plate, then the excessive accumulation of electrons deposited on the accessory plate can push out away from each other and exit through an external load back to ground. And hence there at ground again be collected up from the cathode to the accessory plate, around and around, in a closed loop system and thus become a constant generator.

The answer to blocking the normal direction of current as seen in the meter, is to use a series blocking semiconductor diode to stop current flow in that direction. Hence the answer here is simple, merely another diode of the semiconductor type.

The voltage from ground to the accessory plate is on the scale of 200 to 500 volts and the voltage drop across the semiconductor will only be 0.7 volt. Hence a considerable amount of efficiency as well as energy can be generated. Clearly allot of force is seen here voltage wise. *As, a high voltage output.* Hence allot of electrical potential: in effect, lots of working potential as a device.

Example $200\text{ v} - 0.7\text{ v} = 199.3\text{ volts}$ across the load



complete SFG circuit
fig 4

With the addition of the semiconductor diode (Dx) we hence block electrons from being attracted up to the accessory plate, and with the elimination of this counter flow of current, the excessive deposit of electrons accumulated up on the accessory plate (from the cathode) now see a low pressure escape to ground through the load and diode in the direction shown by the arrows. With respect to the semiconductor diode's cathode end, the accessory plate will read negative in polarity by reason of the excessive deposit of electrons escaping confinement there. With respect to ground however, minus the semiconductor diode, the potential from ground to the accessory plate will read positive on the plate, see figure 3. Make sure this is clear to you.

This means that the polarity on the accessory plate will only read negative through the cathode of the semiconductor diode since it allows current to flow out from the accessory plate in the illustrated direction through the semiconductor diode to ground. As indicated by the arrows in figure 4. The force of the excessive accumulation of electrons moving out away from each other constitutes a current flow in the shown direction through the branch circuit of the semiconductor diode. This forced electron flow across the semiconductor diode's p-n junction forward biases the diode (turning it on.)

At this point you may wish to return back to page 12 and read these four pages of this chapter again. If you feel that you need to review this then do so. Armed with the knowledge of the view so far, you will be able to reformulate this again and hence perfectly grasp the new idea if you do re read this small four page chapter. (You should have also read pages 4 to 8. And reviewed math table page 11.)

*Further Concepts And Attributes

“proof of the principle”

In the previous chapter we studied an addition known as the “accessory plate” which allows us to “access” the accumulation of electrons in our scheme. Hence accessory plate is a good name. In the chapter after this you will see how that we do not have to wait for such an SFG device to be made since we can use current manufacture vacuum tube diodes in a circuit configuration that gives us the same “principle of operation.” That principle of operation is in the negative polarity above the ground with respect to diode Dx. This phenomena is hence **the proof of the principle**.

The proof of the principle being expressed on the previous page by the fact stated “With respect to the semiconductor diode's cathode end, the accessory plate will read negative in polarity by reason of the excessive deposit of electrons escaping confinement there.” Hence when the circuit is built you will read such a negative voltage with respect to Dx which in itself is a measurable demonstration of the principle. And hence the first proof. The mere expression of the fundamental physics applied here in this scheme as sound science expressions, is proof of the principle beyond mere theory. Being the known physics are effectively demonstrated in words and illustration. *No unknowns are hence left dangling in space with loose ends!*

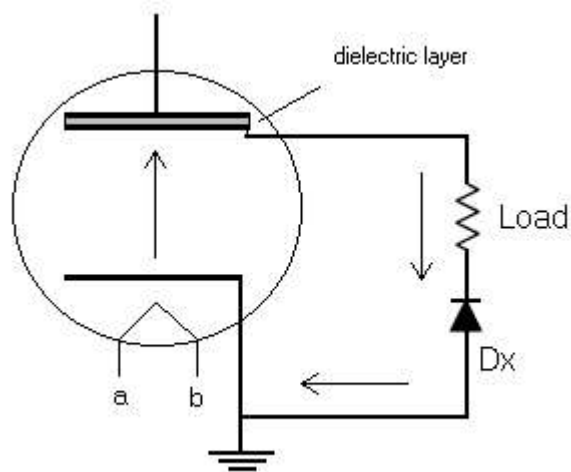
On page 13 you read: “ A thin but strong “dielectric insulator” exist between the two (plates) so that the electrons that are attracted to the accessory plate are not allowed to flow to the main plate.” Once the main plate has the voltage applied and its electrons stripped of by the voltage and its resultant field voltage is applied to the accessory plate, no electrons can flow from the accessory plate to the main plate and hence there is no path for electrons to flow from the cathode up to the main plate, and then into the power supply circuit of the main plate. This path is mute. No depletion!

After the main plate is first initially charged, current flow ceases, and afterwards during operation, there is no current flow through the power supply: though the power supply voltage is maintained so that our equation of $Nm = v^2Q = v^3C$ does not collapse. Hence we must retain the voltage on the plate although there is no current flow. This keeps the charge on the plate at a constant reference voltage above ground potential. Remove v and $Nm = v^2Q = v^3C$ collapses and force ceases (as discharge.)

Yet, without this current flow to the main plate, we can not calculate a concept of Watts being used here through the power supply (which is the rate of flow of current in coulombs times the applied voltage or $W = vI = E \times I$). Since, $I =$ coulombs of electron mass per second, and $EI =$ joules per second, if we know the charge Q on the main plate as well as its voltage we can calculate in terms of joules “of energy” rather than joules per second “power” where the charge (Q) on the main plate is stationary and non moving. Hence there still is an equivalent to wattage. Wattage is a time rate unit of joules per second and joules is merely a unit of potential energy. When that energy has flowing electron current (I) behind it (as a quantity per time) it then is able to be expressed in Watts. However if it is a stationary charge (Q), then it is expressed in joules. And even though it is stationary, it still has a voltage associated with it as well as the charge and hence a calculate-able force in Newtons per meter. Hence force exist!

A fully charged dry cell battery has a certain excess deposit of electrons on its negative terminal and a like depletion on its positive terminal. And there is a voltage between the two. Although it may not have a load on its terminals, it still has a calculate-able energy or power we can determine in joules. If we allow current flow from the battery then we can express that in terms of joules per second or watts. The concept of joules then, can not be expressed as watts terms unless there is a flow of current in terms of coulombs per second multiplied times the emf or voltage. This view comes into play with the idea of the SFG device where we do not deplete our energizing charge. The time factor along with the fact that the current is multiplied times the voltage expresses a power function. Watts are an expression of power since 746 watts equals one horsepower. Power then means motion. Remove the motion and there is potential energy, hence capability, rather than power.

The potential energy can be used directly, to move mass if we put it to work. The mass we move here is not the energizing charge mass (on the main plate) which we use merely for field force energy but a separate mass of electrons that we accumulate up with the accessory plate and direct with diode Dx.



current can only flow in the loop direction
shown by the arrows
fig 5

* Note: If the device above did not work as designed then all we would have to do to get it to work is to place a “high pressure current source” in series with the diode (Dx) loop branch and “force it to work.” This high pressure current source may merely be a battery in series with diode Dx. Or a low voltage power supply or solar cell. As far as a battery is concerned it can be a 9 volt or 12 volt battery. If you have problems with your first built solid state model then you can remember this idea and use it. I will illustrate this for you later on. The idea will be useful in troubleshooting your circuit and in the study of other SFG applications and schemes of operation. Hence this idea proves useful for certain applications. Do not forget to use it!

The next chapter will illustrate how to use actual vacuum tube diodes to build a circuit with these working concepts.

Actual Off The Shelf Vacuum Tube Diodes In A Working SFG Circuit

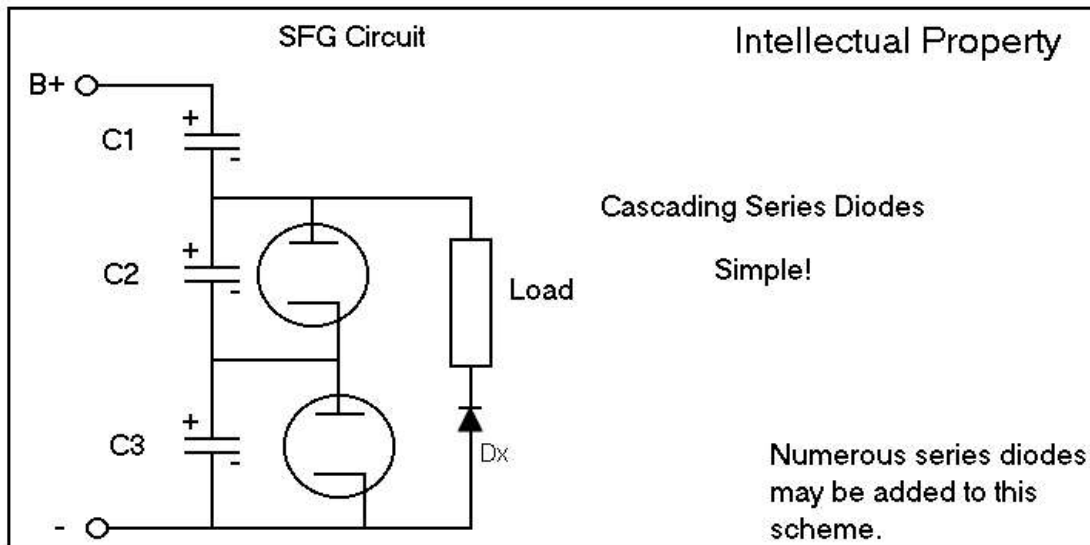


fig 6

At this moment this circuit is merely for study. Anyone interested in this circuit will have to obtain the data from the solid state versions studied later herein so that they can design a version using vacuum tube diodes. The thing about these circuits however is this, **dangerous and even lethal high voltages will be encountered**. If you are interest is in this version, then proceed with caution and at your own risk. Skill level here is for expert technician and engineer. I am not responsible for your safety: you are responsible for such. Understand?

Thus, this circuit is merely for study here. There will be several low voltage and hence safer solid state models later herein that you may build via the enclosed parts list. And you will learn how to design these for any power level and voltage you have need of.

The idea of the above circuit is simple, the capacitors act as voltage dividers to apply proper voltages to the plates of each diode (parallel branch.) C1 acts as the first voltage divider and it takes the place of the “main plate and dielectric function” of the examples seen in the previous chapters: the positive plate of C1 is connected to the B+ power supply line and the negative plate is connected to plate of the upper diode and thus the negative plate of C1 is equal to the previously discussed accessory plate. Likewise the dielectrics of C2 and C3 also act to block dc from traveling to the power supply and hence current can only flow in the loop of the branch made up of the working load and Dx.

This circuit thus equivocates the principles set forth in the previous chapters. Also, careful examination will reveal that this circuit can simply be converted to one using semiconductor diodes throughout. If you do not understand, then examine it again, the circuits simplicity may be deceiving. Its configuration is basic and simple. Yet, remember there are numerous profound views of application behind it. Hence it is deceiving in its simplicity. Yet, it boils down to a simple configuration and a simple objective of physics. Simple to construct.

The vacuum tube diode circuit requires a high voltage power supply to energize it. The solid state versions made up of semiconductor diodes can be energized by a 12 volt power supply or by a battery. Using this scheme with a battery as the energizing source will result in the battery exhibiting a long powering life where the SFG circuit is employed in the powering scheme, since here we reduce the idea of depleting our energizing charge. Except for some small dielectric leakage currents in the capacitors, the loss of the energizing charge is small and hence the power will run for a very long time. The fact of the dielectric leakage currents in actual capacitors means that there are losses, however they are minute but they do add up over time: hence the battery will eventually one day run down. In use in something such as an emergency survival lamp, if the lamp is turned on and left on then it will be on for several months before going out. Get the idea here? Or, suppose you energize this SFG circuit with a solar cell system, then, when will it run down? Hence this demonstrates a better way to utilize available electrical energy. And yet, there is still no free lunch in the universe.

-When dealing with series connected capacitors, the charge that is stored in each capacitor will be the same, and, is analogous to the current being the same value or common to all resistances in a purely resistive series circuit. Only the voltages will have a different value across each capacitor by reason of the value of the capacitance of each. Note: energy wise, the individual component charges add in the series branch.

$$Q = vC$$

$$v = Q/C$$

$$C = Q/v$$

If we want a certain voltage across a capacitor we utilize the equation of: $C = Q/v$ which will give us the value of the capacitance required for that voltage. In the case of series connected capacitors we use the same value of charge Q for each capacitance.

This actually means that the over all design and analysis math involved really is simple and is no more complicated than Ohm's Law. Only: numerous repetitions of the math are used to achieve the objective goal of the SFG device. So do not be concerned over the math involve when you finally see it all. The above equations are (Kirchoff's etc) derivatives of Ohm's Law applied to charges in capacitances which are similar to direct current through resistances, and hence, is merely Ohm's Law applied to capacitor charges. The over all math utilizes mere multiplication and division expressions as well as algebraic addition and subtraction and thus is really very simple in terms of equations: that is to say there are no complex equations in the design and analysis math. Just numerous in application.

This changes however when you get to using the math for such things as Newtons per meter and joules, of which you have seen the equations for in the math table and in the previous chapters. You may never have to use those equations unless you are an engineer and then they will come in handy. In such cases as looking at how much energy in joules per second terms you need to move a mass to do work and thus how much force is involved and whether you want to use a high voltage or low voltage force? Etc. And yet, you can do all of this in mere Watts terms. **The Nm and j terms are more suited for the study of the force and overall energy balance of the SFG devices.**

I have not disappointed you so far have I? I mean, do I have your attention now? Is there perhaps a continuous shining light here? I hope so, at least I hope you have discovered something here that is interesting and adventurous. Something purely science in ever facet. Thus, I am the teacher here and you, if you are an engineer you are an advanced student in my course providing that you are using an open and receptive mind. Consequently this study has not been about such things as other publications about supposed alternative energy topics focus on, such as ufo star drives and space alien power sources: I do not know where them fellows get that stuff from but I have not seen them use any real science in any of their text. I suspect they are merely selling books by entertainment means: disguised as science. Those publications do a disservice to the real inventors out here. Yet, by now, you should have gathered that this text and its topic are real innovations and not something theoretical or hence mythological. Here you are reading about real science at work.

If the fellows who sell the mythological derived publications do not like what I just said about their pseudo science publications; well, this is a free country and I am exercising my right to freedom of speech and the press. Just like they seem to be doing. Yet, where is their science? What can they show us of their scientific knowledge and proofs? Do they have any evidence whatsoever that a space ship crashed at Roswell? I have not seen any evidence of any such things anywhere at anytime, have you? Where is the proof? And where is the proof of their inventions? I fortunately do know however that there are numerous real inventors out here with some very good inventions for us coming in time. And here you are seeing something real once and for all, finally: and you know it. Hence are you disappointed? Well, enough of this, and on with the adventure!

Solid State Equivalent

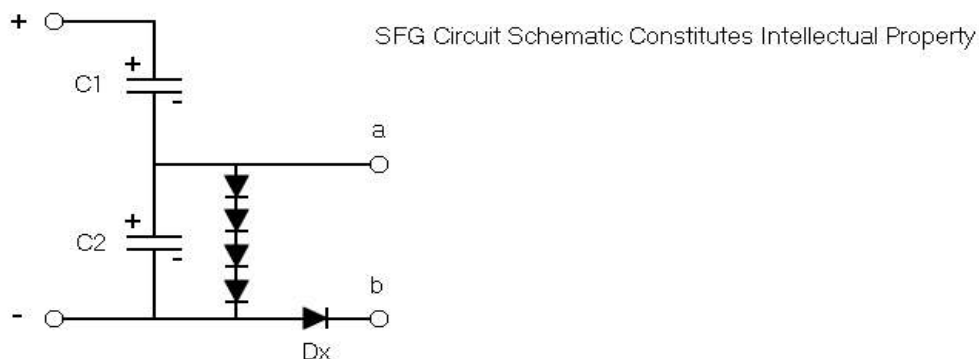


fig 7

Recalling the schematic for the vacuum tube diode SFG circuit we can see how that the circuit equivocates into the solid state version. Although all of the diodes parallel to C2 may seem odd or in-ordinary, I hope you see how very easy it is to build this technology.

Again, C1 serves both as part of the voltage divider, and as our equivalent of the main plate, dielectric and accessory plate concept we priorly studied. Both C1 and C2 will allow current to flow only during initial charge up after which no current will flow through them to the power supply (except for a very small leakage current). Design of the voltage divider is via use of the equations on the previous page (19.) We will analyze the concepts of the design in this chapter and then analyze the math.

Do not forget that the energized circuit has energy stored in it even though there is no longer a charging current flowing into the circuit. It is like how a battery works. We can charge up a battery and then remove it from the charger and it still has the applied voltage across its terminals because of the charge that we have stored within the battery. In the case of the SFG generator circuit we must retain the power supply voltage although the device is charged up else the scheme of operation collapses.

In the SFG device we have the stored charge Q and, the retained power supply voltage v , so that we can have the two items needed for force, where: $v^2Q = Nm$ And as said previously, remove v and the equation collapses.

In fig 7, if we remove the power supply voltage then the circuit will momentarily run on the charge stored in $C2$ however, this means that now it is discharging and soon it will cease to operate. The voltage drop across $C2$ is calculated to be equal to the sum of the forward bias voltages of the four ($n\#$) diodes which is: $0.7v \times n\#4 = 2.8v$ Hence $C2$ forward biases the four diodes. It does not take very much of a dip in the voltage of $C2$ due to discharge to cause the forward bias voltage to cease. This type of forward biasing of the diodes I have come to call “external biasing” for reasons you shall learn of herein. As long as v is kept on the input of the circuit there is no reason for discharge to occur.

In order to achieve some power we have to increase the number of diodes. For a 12 volt generator output we would have to use 19 diodes. $19 \times 0.7v = 13.3v$ We then subtract $0.7v$ for the voltage drop across Dx and that give us: $13.3v - 0.7v = 12.6v$ Also, a 12 volt output version means, that our power supply input will be on the order of 18 to 24 volts. Analysis of the circuit in our further discussions here will explain the output voltage more specifically however the number of diodes in the “diode loop” or branch circuit determines the output voltage.

Also, the diodes self regulate the output voltage regardless of the current up to its peak max value. Thus the output voltage is regulated naturally by the diodes over a wide range of load current. We then have self regulation which is a nice feature this circuit offers.

In operation, the electrons at ground potential or chassis potential see successive 0.7 volt rises in positive potential across each externally biased diode p-n junction and hence are attracted up potential through the diodes to terminal a. of fig 7. Each diode then is like the rungs of a ladder or the steps of a stairway for each electron. Electrons can not help but be attracted up in excess deposit at terminal a. This also explains why the output voltage is determine by the diodes of the loop branch circuit.

Terminal a. will appear negative in polarity only with respect to terminal b. through Dx . If we however measure from chassis ground to terminal a., minus Dx , terminal a. then naturally reads positive. This phenomena then is the exhibition of the proof of the principle.

For reference this type of configuration used in figure 7 is called a “cascading series configuration,” later you will examine a “strung series configuration” and its advantages.

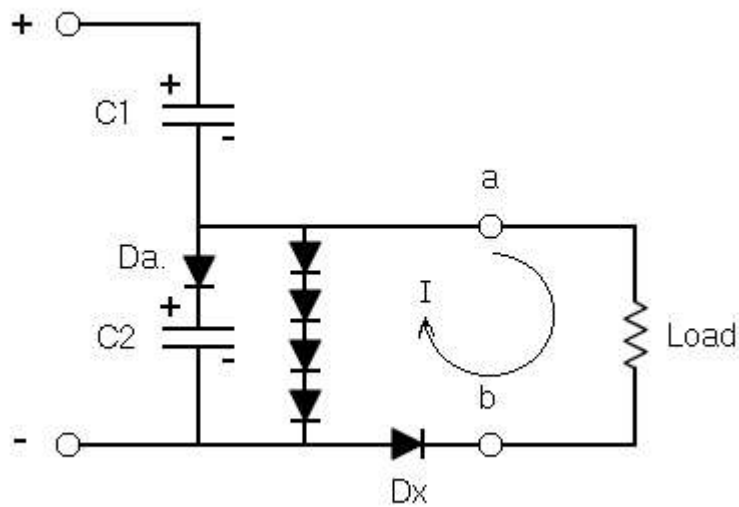


fig 8

Here we have added the load resistance at output and a diode known as Diode a. or Da. Da. is a series blocking diode that allows electrons to be taken off the positive plate of C2 during initial device start up charge. Once C1 and C2 are fully charged up then current cease to flow in them and Da. However there is a charge retained across Da. because there is a voltage drop across Da. Likewise every diode p-n junction has a distributed p-n junction capacitance charge across it like a capacitor and this fact is made use of in Varicap diodes. This p-n junction capacitance is made use of here. Da. afterwards acts to prevent electrons from being attracted back to the positive plate of C2, this then acts to block electrons from the diode loop branch from getting to the plate of C2. They ordinarily would not go there anyways however, we are now allowing the electrons in the diode loop to mostly see the force of the excess of electrons deposited on the negative plate of C1 and this encourages the electrons in the diode loop to want to repel away from them and travel on out to terminal a. Hence there is also a scheme to effect some repelling force on the manipulated up electron and thus propel them on to where we want them to go.

Here, we are looking at how electrons want to act under unlike charge influences and then under like charge influences and we are seeing schemes whereby we can put all of the particular parts to work. We however can not see them at work since they are atomic particles and invisible forces so we have to conceptualize it all and then build the visible parts up around the scheme. And somehow it all seems to get progressively deeper with numerous added steps as we go: and hence, this is a science and a technology all on its on. I hope you can appreciate the breath and the depth of it all. Here we have to occasionally look at things on the electron size scale to see whats up. Again, the simple circuit configuration is deceiving because there are numerous complex views being systematized together here in a broad overall scheme.

At this point if you feel you need to review and summarize then do so, I hope you have been taking notes and jotting down things in your own words. Make sure that you grasp and understand the concepts before you continue on in this volume. All you have to do is to grasp this clearly just once: and then your off to building lots of these.

Math Analysis “designing a circuit”

The types of electrolytic capacitors that we are most likely to come into possession of will come from Radio Shack. These are not what we can call high energy types of capacitors, such as the super capacitors we can obtain from Evans Capacitor Company (more later on.) Thus our first test bench models will be very low power versions since the types of capacitors we have access to limit our choice here. We can however later on select some good computer grade types and build for higher power. The low power model will suffice for us to be able to test things out on the bench, though we will only be generating current in terms of the micro amp scale to start. This scale of amperage is also unlikely to burn out anything if we have a short circuit accident. With insight and experience you will be able to upscale your designs for higher powered models later on. The “super capacitor technologies” now make possible such capacitance values as 300 Farads, which was once considered only possible with a capacitor the size of a semi tractor trailer. Now made smaller, these types can make possible solid state versions of the SFG device that generates power in the “hundreds of watts scale” and even up into the “kilo watt scale.” Limiting factor however, is the cost at this current time. Yet, down the road that cost will come down.

One thing you may want to keep in mind is this, if we build these circuits in a mass production way, then each identical module can be paralleled up with another to increase the power. Several can be done this way. Merely connecting all identical terminals together will increase the power in a parallel fashion. In this manner we can have plug in modules that increase the power output. The economy of diodes can be placed on a main or mother board so that each module does not have to have diodes on board which increases cost. The diodes hence are on a main board the modules plug into and this reduces semiconductor cost in manufacturing. Potential for development in the commercial private sector by private individuals and commercial private enterprise is great. Merely educational scientific test models and text, have a market place among experimenters of the hobbyist and researcher sort. Thus, there are numerous markets able to take off with this and make it a reality with numerous developments over time coming forth. A few years from now, a vast difference in the way we look at this at present will have occurred. More earth friendly technologies will come forth.

This being the math section, some mention of the overall economy and steps in development belong here. There will be some need for study of “capacitor leakage currents” for the efficiency portions of the design. The lower the leakage current of the capacitor dielectric the more efficient the generator circuit will be. This will be made evident in its own section herein. And as I said earlier, there is no free lunch in the universe. This is what we learned from “A Brief History of Time”, and this is how it is true here. A little random disorder runs through the schematic order. We have this matter of entropy in the universe that makes things as they are: order, with a little chaos. Yet, the luster of the diamond is in its natural flaw.

“Coming soon! Capacitors that have precision industrial diamond as a dielectric!”

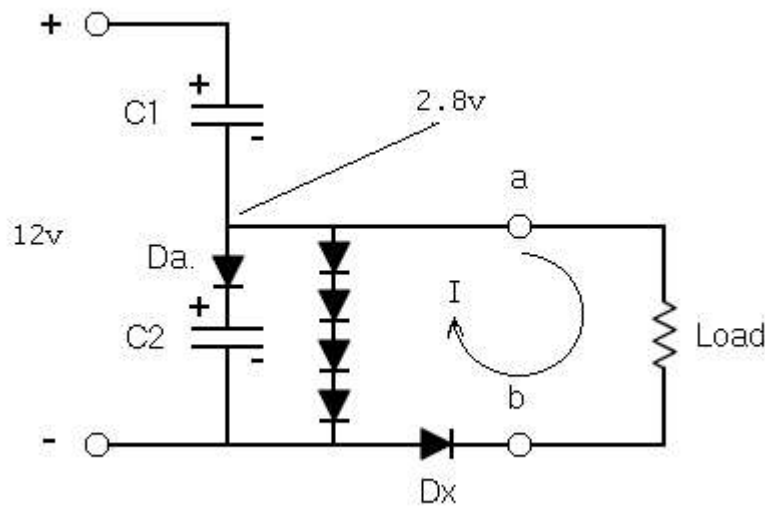


fig 9

The type of diodes we may use for this are small signal diodes or some Schottky Barrier types for small signal applications. Our current in this example will have a maximum value of only $510 \mu\text{A}$ so our choice for diodes must be among those able to pass small signals. Likewise our output voltage will be small, only 2.1v ($2.8\text{v} - 0.7\text{v}$ $D_x = 2.1\text{v}$) Our capacitors may have a value of $\pm 20\%$ rated capacitance and work however better accuracy will be had using those $\pm 10\%$ rated capacitance. Tweaking of the design values will be done using capacitors of the 1 to $10 \mu\text{f}$ value, so some extra caps around will come in handy in your study. If your diodes will not come on with such a low current then the more advanced model later on that has larger values of capacitance will provide more force and charge so that a larger current will occur. The value of capacitances in this circuit can be scaled by a factor of 10 or 100 so that more current is available to be passed by the diodes if they will not come on with such a low current. The above model is based upon my first text bench model which had an output voltage of 9.1v , this circuit was branch 1 of that circuit. The original had three branch circuits. I will detail that circuit when we study “strung configurations.”

The input voltage will be the typical 12 volt test bench supply, you may use 13.8 voltage if that is the supply voltage you have. Do not worry about building this at this moment, this is just a study example.

The first thing we want to consider is the desired output current and as mentioned above that current is $510 \mu\text{A}$. The diode loop branch hence must have a parallel charge next to it in C2 to support this amount of current. That amount of charge must be greater than that of the diode loop. It does not have to be all that great in comparison however. If the current in the diode loop is given a designation as I_e then the charge in C2 will be equal to: $(\text{number of diodes times } I_e) / .68$

$$\begin{aligned} (n\# 4 \text{ diodes } (510 \mu\text{A } I_e)) / .68 &= 3000 \mu\text{Q } C2 \\ n\#4 (I_e) &= 68\% \text{ of } QC2 \\ \text{ratio} &= 5.88 \text{ to } 1 = \text{minimum mean standard} \end{aligned}$$

Since I_e is a moving current and its counter balance of QC_2 is not (but is a stationary charge) then $(n\# I_e) / .68$ will always be expressed as Q in coulombs terms rather than amperes.

The charge in C_2 in contrast to I_e is such that QC_2 is the counter balance to the moving charge I_e (electron current) in the diode loop branch. Naturally QC_2 is greater for “source of energy” purposes since QC_2 is the parallel source of energy to I_e . It is the positive potential “force” of QC_2 that we need here to effect work being done in the diode loop branch. Hence the energy balance is such that, $(v_{Da} + v_{C2}) QC_2$ is greater than that of $2.8v \times I_e$ in joules terms. We do not have to hence go and define all of the total energy of the circuit since the balance of the work accomplishing portion is demonstrated here by “ $(v_{Da} + v_{C2}) QC_2 = \text{joules}$ ” and it demonstrates that there is no such thing here as a violation of the law of the conservation of mass and energy. Later on, we do have to consider the losses encountered due to dielectric leakage currents in the capacitances which is expressed in “joules per second” terms (watts). This later consideration then, does take into account the entire circuit but there is a shortcut to solving that when the time comes. (The end result of calculations compares “real time” moving currents to “stationary” non moving charges as well as the leakage loss currents where the energy balance is compared and expressed in “watts” terms. Where: 1 watt = 1 joule/sec)

$$\begin{aligned} & \text{energy balance ratio} \\ & ((v_{Da} + v_{C2}) QC_2) / (n\# I_e) \\ & \text{where the energy source and hence force for } I_e \text{ is} \\ & (v_{Da} + v_{C2}) QC_2 \end{aligned}$$

This leaves us with realizing that C_1 is merely for our main plate, dielectric and accessory plate counter part equivalent: and that C_1 is part of the voltage divider more so than a source of energy for I_e . Being that the real source of energy and force for I_e is seen as being across C_2 . Yet as a voltage divider component, C_1 has its energy that is stored in it and this also adds to the total of the input energy where the input energy will hence be greater than that generated across the load at terminals a. and b.

C_1 and C_2 are such that they equivocate to a battery that does not have a load, hence full of charge but no current being drawn since the capacitors do not pass direct current (dc) except for a small leakage current loss. We shall for this moment say that “virtually” they pass no current. Looking at it in the “virtual view” of virtually no current for the time being helps us to understand the performance better, so we will look at the capacitances as if they are perfect and theoretical rather than actual so that we can keep track of the idea here. In the perfect theoretical model after the initial charge up of energy is stored in C_1 and C_2 then no more current flows across the input terminals from the 12 volt power supply though we must retain the 12 volts across the input for our force reference. In the real time sense, there is no such concept as wattage being drawn after initial charge up of C_1 and C_2 , though there is a moving charge generated at output. In real time we appear to see only the generated output power in watt terms whereas there is no such concept at input. Yet, although the charge generated at output is a moving charge the reason we can not have a concept of wattage at input is because we do not have moving charges there: our energy source is a non moving charge expressed in joules and not in joules/sec.

Hence we do not physically deplete our energy source. This then is the Chief Technological Advantage of stationary field generator science. (Or SFG Science)

The definition of power here is not only in joules/sec terms but also in mere joule terms and so it is not necessarily an expression of energy although some use the joule in a way to express energy. The charge in a battery that does not have a load across it is still power in a mere stored up sense. Hence it is power in terms of potential energy terms rather than kinetic. Likewise the concepts of power and energy are interwoven in view and mathematically. The real expression of either does not come in the terms of joules but in terms of ergs and dyne's. And the funny thing here is that although the electron charge is looked at as energy, it is also inert mass. The electron is thus mass energy. Mass in terms of inertia and in terms of a mass quanta of energy where the basic quantum or quantity is one photon. In these minute scale views, things are interchangeable, we can view energy as mass in the quantum views or as (a non mass) wave motion in the wavelength views. In the quantum view the wave motion which is not suppose to have mass traveling with it is seen as having mass energy photons traveling with it and thus is a view somewhat counter to the definition herein of paragraph 2 on page 7. What we see happening in the universe may be a matter of faith, a matter of what we believe exist: more so than some are willing to admit the possibility of. "Hawking's Particles" are such an example here, as an example of faith making things come into view. Likewise the SFG device will not come into view without faith. If you do not believe it, you will not pursue it, and so you will not see it. I am not at all concerned with those who will not believe, rather, I am looking at the believers. I shall call SFG science, "Science From God." And I have my reasons for doing so. Hopefully you have enjoyed my science book so far?

Summary

$$vn\# = vDa. + vC2$$

QC2 Equals

$$(n\# 4 (510 \mu A Ie) / .68 = 3000 \mu Q C2$$

$$n\# Ie = 68\% \text{ of } QC2$$

$$\text{ratio} = 5.88 \text{ to } 1 = \text{minimum mean ratio}$$

You can tweak the ratio to 6:1 or higher
if you have very low leakage current capacitors.

Energy Balance Ratio of "QC2 / Ie" Equals

$$((vDa. + vC2) QC2) / (vn\# Ie)$$

Where the energy source and hence force for Ie is

$$(vDa. + vC2) QC2. = \text{joules}$$

This also means that
the charge of Da. is equal to QC2.

$$\text{Hence: } QDa. = QC2.$$

Where the charges are equal in all series connected capacitances.

"This charge is also stored in the capacitance of the p-n junction of Da."

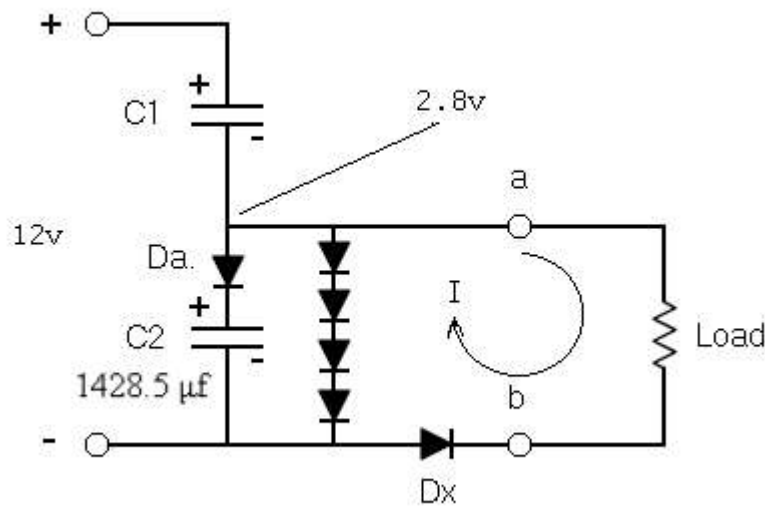


fig 10

The charge $QC2$ is parallel to I_e and this means that $QC2 + I_e$ is in series with $QC1$ therefore: $QC1 = QC2 + I_e = QDa. + I_e$

Now: the voltage across $C2$ is equal to $12v - (vC1 + vDa.) = v_{n\#} - vDa. = vC2$.
 Where: $v_{n\#}$ = voltage sum of series diodes in the diode loop. The capacitance value of $C2$ equals: $C = QC2 / v C2$ Where: $C = Q/v$

If:

$$0.7v \cdot n\#4 = 2.8v,$$

and,

$$vDa. + vC2 = 2.8v,$$

and,

$$2.8v - 0.7v Da. = 2.1v C2,$$

then:

$$.003 Q C2 / 2.1v C2 = 1.42857142857143E-03 \text{ farads}$$

$$C2 = 1428.5 \mu\text{f}$$

I hope that you noticed that the charge in each diode, although the same in each diode, is individual to each diode as a charge stored in each, and so, the charge in $C2$ is equal to the sum of the charges of each diode divided by .68 hence $n\#$ (I_e) = summed Q of diode loop. Likewise the charge in $C1$, $Da.$ and $C2$ is the same in value, yet, each is an individual charge held by each component. Again, the stored energy is greater than the generated energy or power even though in the real time operation as stated earlier, we do not have a concept of input wattage in the theoretical virtual model. And in the actual model, the leakage current that is replenished by the power supply adds up to a minute input power as compared to the generated power. Hence in real time measurements, there appears to be an **over unity** scenario. We have minimized the concept of a large continuous input power at the input since we stored our power in the circuit in terms of a charge we do not physically use, except for its invisible field forces. Awesome!

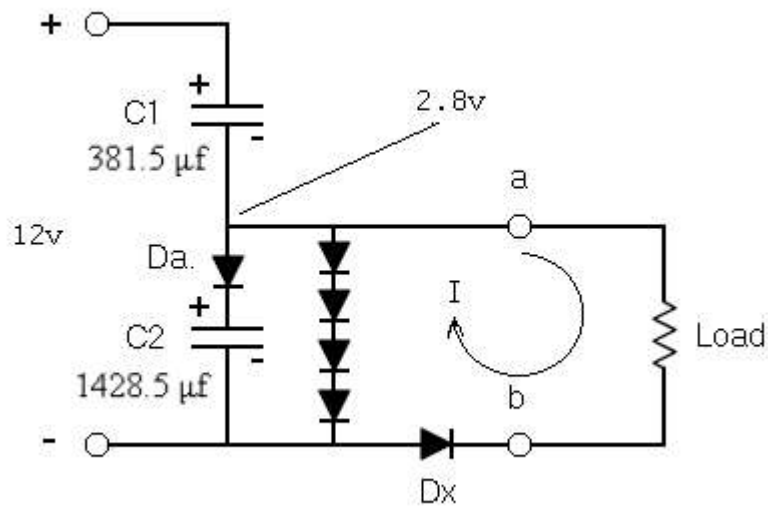


fig 11

The next thing we define mathematically is the voltage as well as value of C1 where $v_{C1} = 12v - (v_{Da.} + v_{C2}) = 12v - v_{n\#}$ and $C1 = (I_e + Q_{C2}) / v_{C1} = (I_e + Q_{Da.}) / v_{C1}$

$$v_{C1} = 12v - 2.8v \ n\# = 9.2v \ C1$$

$$C1 = (.00051 \text{ A} + .003 \text{ Q}) / 9.2v \ C1 = 3.81521739130435E-04 \text{ farads}$$

$$= 381.5 \ \mu\text{f}$$

The total energy going into the device is equal to:

$$(v_{C1}(Q_{C1})) + (v_{Da.}(Q_{Da.})) + (v_{C2}(Q_{C2})) + (v_{n\#}(Q_{n\#})) = \text{joules input} = j \text{ in}$$

during initial charge up, and is visibly great in extent of equation

The sum output energy generated is equal to:

$$(v_{n\#} - 0.7v \ D_x)I_e = \text{joules/sec output}$$

and is visibly small in equation

*** The I_e balancing force is equal to:***

$$(v_{n\#})^3 (Q_{C2}) = N \text{m} \text{ -stationary field force, usually in whole Newton units}$$

*page 32

$$v_{n\#}(Q_{C2}) = \text{joules -stationary charge}$$

Where:

j in > joules/sec output

$$(j \text{ in}) / (j/\text{sec out}) = \text{total device energy balance ratio}$$

Where j in, is via a stationary charge Q and is not moving current I, in the virtually perfect theoretical model.

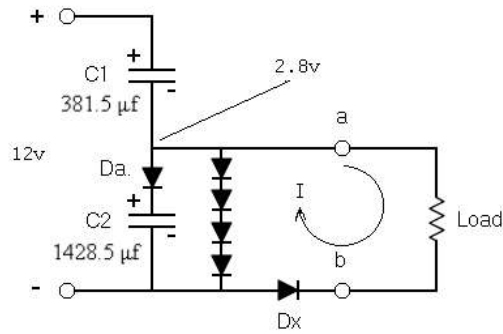


fig 12

Design And Analysis Summary

The design always begins with specifying the desired output voltage and maximum current. And then the design is worked backwards to the power supply voltage that energizes the SFG device.

Voltage output equals:

$$v_{out} = v_{n\#} - v_{Dx}$$

where:

$$v_{n\#} = v_{Da} + v_{C2}$$

$$v_{n\#} = V_{in} - (v_{Da} + v_{C2})$$

V_{in} -equals power supply input voltage

QC2 equals:

$$(n\# I_e) / .68 = \mu Q C2$$

$$n\# I_e = 68\% \text{ of } QC2$$

ratio = 5.88 to 1 = minimum mean ratio

v_{C2} equals:

$$v_{C2} = v_{n\#} - v_{Da}$$

C2 equals:

$$C2 = QC2 / v_{C2} = ((n\# I_e) / .68) / v_{C2}$$

v_{C1} equals:

$$v_{C1} = V_{in} - v_{n\#}$$

$$v_{C1} = V_{in} - (v_{Da} + v_{C1})$$

QC1 equals:

$$QC1 = (((n\# I_e) / .68) + I_e)$$

C1 equals

$$C1 = QC1 / v_{C1} = (((n\# I_e) / .68) + I_e) / v_{C1}$$

Where:

$$Q = vC$$

$$v = Q/C$$

$$C = Q/v$$

Insight

In the actual model we can visualize a “virtually lossless device” by reason of the small amount of leakage current that superior grade capacitor dielectrics can offer. Whereas in the case of the “virtual theoretical device” there is no loss: this is in the case of the on paper model. However in that paper model we can calculate the actual model by use of the manufacturers dielectric leakage current rating per capacitor volt. Thus we can analyze on paper those losses and then tweak them by use of choice capacitor selections. {Do not confuse the virtually lossless concept with the virtual device. Since the virtually lossless concept deals with the actual device.}

There is a particular insight here regarding very poor capacitor grades where, due to the manufacturing method and process: the specific technology of the capacitor manufacturer, where the type or brand is very lossy due to in-ordinarily high leakage current. This would result in an SFG model that has a replenishment power supply current and hence real time input power that competes on the scale with the generated output power. In this case, with a model that is very lossy, the fact that the input may compete with the output in such a model however does not negate the attribute of the proof of the principle as discussed before. There will still be the negative voltage that is measurable at terminal a. with respect to Dx even though in the lossy model there is no realization of the maximum efficiency that we can have with well chosen capacitors. Hence, even if you can not find such superior grade low leakage current capacitors, you can still build the model to test for the proof of the principle. This then takes allot of pressure off of you if you are investigating the SFG device for performance in terms of realizing the proof of the principle.

Thus in testing the principle we do not have to attempt at all to make an efficient model the first time around if we hence can not find those chosen types of electrolytic capacitors. Or, if you have a shoe string budget, you can use what types that are available. Knowing that if you can not design for efficiency with those types, you can never the less test the phenomena of terminal a.'s negative attribute with respect to the cathode of Dx.

Hence have heart, developments get better with time and experience.

Here we are hence considering the advantages of an “economy experimental model” versus a more “specifically and technically designed model” which for some will be a more expensive model. The “economy model” may not realize the efficiency, yet in some case it may: however, there are numerous test and experiments that can be done with the model such as the “basic proof test” and the “forced current test” using a “high pressure current source.”

As far as leakage current behavior goes, the leakage current of C2 will be mostly traveling in the diode loop around through the load, though part of it will go through C1. The chose of capacitor C1 then is very important since C2 can be average in grade whereas C1 is the capacitor of greater importance. Hence all of the capacitors used in parallel, to equivocate the value of C1 must be carefully chosen if you are being specific and technical in design. C1 is the capacitor that will pass the leakage current to the power supply. {This ends the basic short version text.}

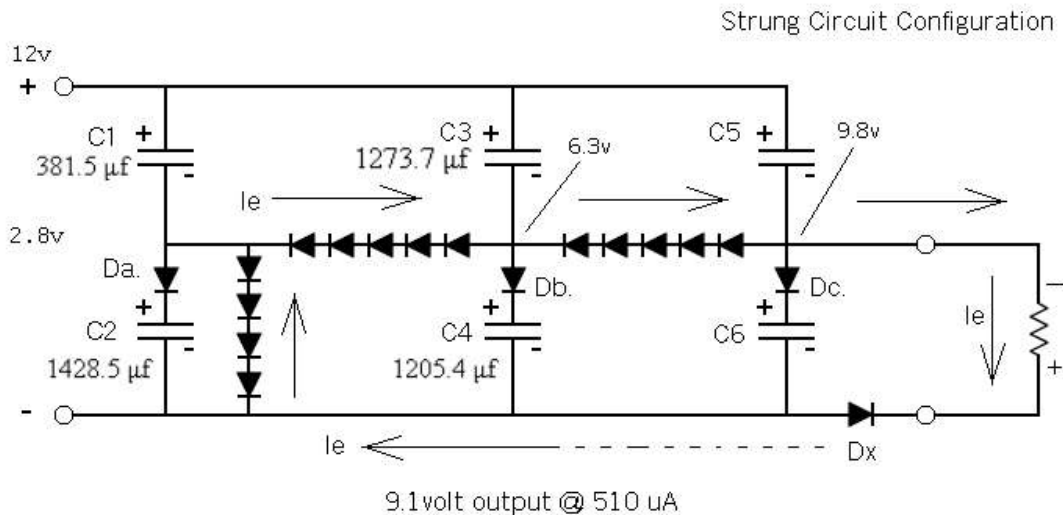


fig 13

This chapter (and the next ones that follow) are not in the basic “short version text” paper, which is an inexpensive synopsis version to acquaint folk with the SFG concepts.

Figure 13 is built off of the previous Cascading Configuration model so that we can quickly get down to looking at adding extra branches that will enable us to scale up the output voltage. The design current I_e is hence the same, however, there will be a greater magnitude of instantaneous peak power with this circuit since there will be some added counter balance charge. (This is actually the first model I built and tested and so I am continuing to use it as my reference.)

The $n\#$ of diodes is 14 and the output voltage is 9.1v. The $v_{n\#}$ is 9.8v, which is the voltage of: $v_{Dc} + v_{C6}$

The object of the extra branches is to match the voltage and charge needed at the locations of the nodes in the diode loop. The voltage of the node will be equal to $v_{n\#}$ all of the diodes in the loop to that node location: this includes the diodes that are from the previous study. The node located at C3 - Db. equals the diodes between ground and node C1 - Da. plus those from C1 - Da to C3 - Db. And in this case the $n\# = 9$. So the value is the sum of all of the diodes from ground to the indicated circuit node. The $v_{n\#} = 0.7v(9) = 6.3v$ at the node of C3 - Db.

The charge of C4 will be $QC4 = ((n\#9) I_e) / .68 = ((9) 510 \mu A) / .68 = 0.00675 Q$ which is $6750 \mu Q$.

$$v_{C4} = v_{n\#} - v_{Db} = 6.3v - 0.7v = 5.6v \text{ C4}$$

$$C4 = QC4 / v_{C4} = 6750 \mu Q / 5.6v = 1.20535714285714E-03 \text{ farads}$$

$$C4 = 1205.4 \mu f$$

$$QC3 = QC4 + I_e = 6750 \mu Q + 510 \mu A = 7260 \mu Q$$

$$v_{C3} = 12v - 6.3v \text{ n\#} = 5.7v \text{ C3}$$

$$C3 = QC3 / v_{C3} = 7260 \mu Q / 5.7v = 1.27368421052632E-03 \text{ farads}$$

$$C3 = 1273.7 \mu f$$

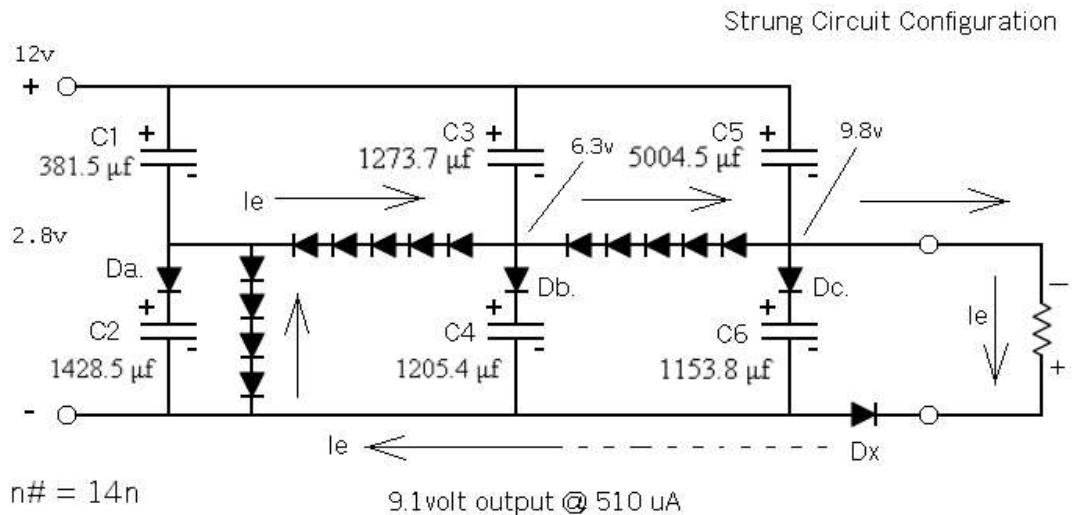


fig 14

Brief notes: notice the way that Ie loops around the circuit through the diodes and the load. This is why I refer to the conduction diodes as the “diode loop.” Also, although the circuit concept is basic, there are numerous considerations that are summed up here. Such that, the result is very complex in technical application terms. Those terms amount to 32 pages of text to this point. Hence, the concepts are compiled into a very technologically advanced scheme which boils down to a simple view in reality: as well as a simple circuit. The principle concept is simple, it however requires numerous views to innovate and place into application. After you learn this, it seems purely simple thereafter. Sort of a no sweat science once you have got it all down.

For ease of use. n# can be expressed as n: as in 14n.

$$\begin{aligned}
 vC6 &= vn\# - vDc. = (0.7v \ 14n) - 0.7v \ Dc. = 9.8v - 0.7v = 9.1v \ C6 \\
 QC6 &= (n\# \ Ie) / .68 = ((n\#14) .00051 \ A) / .68 = 0.0105 \ Q \\
 QC6 &= 10500 \ \mu Q \\
 C6 &= QC6 / vC6 = 0.0105 \ Q \ C6 / 9.1v \ C6 = 1.15384615384615E-03 \ farads \\
 C6 &= 1153.8 \ \mu f \\
 \\
 vC5 &= Vin - vn\# = 12v - 9.8v \ n\# = 2.2v \ C5 \\
 QC5 &= QC6 + Ie = .0105 \ Q + .00051 \ A = 0.01101 \ Q \\
 QC5 &= 11010 \ \mu Q \\
 C6 &= QC5 / vC5 = .01101 \ Q / 2.2v \ C5 = 5.00454545454545E-03 \ farads \\
 C5 &= 5004.5 \ \mu f
 \end{aligned}$$

$$(vn\#)^2 (QC6) = Nm = \text{counter balancing force}$$

The counter balancing force in this circuit may be a little more complicated than the expression above however this equation will give us an estimate of the force at output where the actual force may be slightly different due to there being three branches in the circuit. The force can in no way be smaller than: $(vn\#)^2(QC6) = Nm$ In this example the force is 1.00842 Newtons per meter. This represents a whole unit scale electrical force exerted at output in terms of electron moving potential. An amazing reality once grasped! 1.00842 Newton meters!

Force and Units Scales
For One Newton
“scalar dimensions”

Let us now realize the scale of the units and values relationships: how everything is related to each other, in magnitudes.

In the Strung Circuit Configuration we can illustrate this relationship of the scale of values in their magnitudes between each calculable unit.

For an expression of one Newton at output, on the voltage scale of 10 to 20 volts input: using 12 volts input which is near the 10 volt scale range. We virtually see that for 1 Newton we must use the 10 to 20 volts scale input with charges in the 1000 to 10000 micro coulomb (μC) range and currents likewise in the 100 to 10000 micro Amp (μA) range, along with the capacitances in the 1000 to 10000 micro farad (μf) range such that:

Unit Scales

10 to 20 volts
1000 to 10000 μC per capacitor
100 to 10000 μA
1000 to 10000 μf per capacitor

Results in forces in the .1 to 10 Newton meter range.

In multiplication ranges of .1 to 10.

Considering 10 to 100, etc, multiplication ranges for upscaling applications!

From this view we can see what multiplying any of the values by a scale of 10 might do in terms of force at output in units of Newtons. We also see at what device range we have our base unit of 1 Newton meter. *Hence this model defines our basis for the range of 1 Newton of force per one meter.*

Force of:
1.00842 Newtons per meter
based upon the
9.1 volt @ 510 μA model
standard model
refer to page 32

Further examination of these ranges or scales should be done by an engineer well experienced in plotting mathematical functions and relationships. The above unit scales allow for over lap into other ranges and hence are a base of comparison.

External Biasing

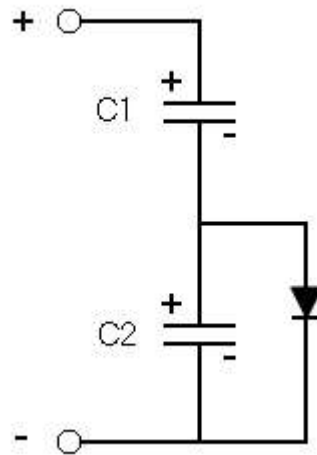


fig 15

Here we are going to analyze what happens as the voltage divider charges up and examine what occurs with merely one diode. In this example the design voltage across C2 will equal 0.7 volt when it is fully charged.

As the circuit has energizing power applied at initial charge up, the voltage of C2 will lag the current by 90° . Once the charge up is complete the voltage of C2 will then reach 0.7 volts and this voltage appears across the diode parallel to C2. This voltage then switches on the diodes p-n junction which will hence conduct a current until the p-n junction is charged up. Since the p-n junction voltage is supplied externally to the diode rather than by a current flow through the diode, the method of bias here is “external bias” and not forward biasing.

This then explains how all of the diodes in the SFG circuit work during initial charge up of the device. You do not have to have a current flowing through the diode after it is charged up for a forward biasing voltage since once you have the diode charged and the bias is being externally supplied it will hence be on and able to work in the circuit to conduct current.

Actually a small current flow exist since C1 has a leakage current and thus it creates a small current that runs through the diode.

In ordinary use the diode obtains its bias voltage from the forward current that flows through it. This new concept may not be understood and hence can be misunderstood if not studied. Here we are not relying upon a forward current through the diode to supply its required voltage drop. Instead we are supplying the voltage externally and parallel to the diode.

Just remember that every diode p-n junction has a junction capacitance of some magnitude across the p-n junction and thus we can utilize it here to store a charge.

Forced Current Operation

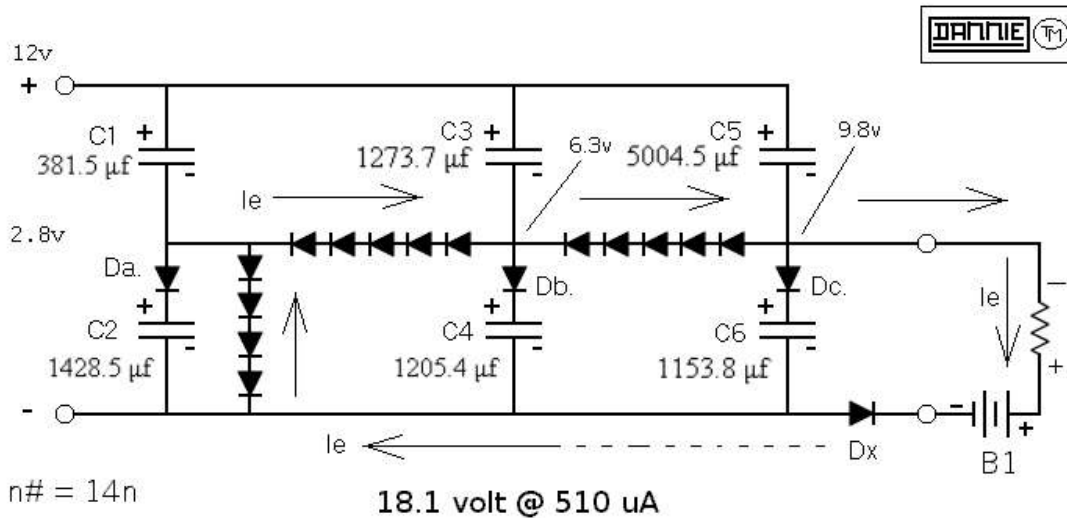


fig 16

In the above circuit we have placed a 9 volt battery in series with the output. Where we are using a forced current high potential source equal to or greater than the generated voltage at output. This then gives us a voltage of 18.1 volts across the output load.

If there was some reason why this circuit could not operate on its own as designed then we could force it to operate in the above shown manner which has already been tested. (Being one of my first test.) You should fall back on this idea if you have to.

In the purely theoretical model, there would be no input current after charge up since there is no leakage current in the theoretical model. The 9 volt battery would hence be an input source of power whereas the 9.1 volts being generated along with its current of 510 μA would represent the generators output. However with the battery in series with the output we have an additive voltage gain of 18.1 volts. Our gain hence would be as follows.

$$\begin{aligned} \text{Input power equals:} \\ 9\text{v B1} \times 510 \mu\text{A} = 0.00459 \text{ watts} = 4590 \mu\text{W} \end{aligned}$$

$$\begin{aligned} \text{Output power equals:} \\ 18.1\text{v} \times 510 \mu\text{A} = 0.009231 \text{ watts} = 9231 \mu\text{W} \end{aligned}$$

$$9231 \mu\text{W} / 4590 \mu\text{W} = 2.011 \text{ difference power gain}$$

$$\text{a } 2.0111 : 1 \text{ ratio}$$

Hence a over unity scenario again! And here we can see how we may use this regardless of how efficient it may work after built. With the real model, we will have a leakage current being replenished at input: which will make the actual ratio less than 2:1 but greater than 1.75:1 with good capacitor dielectrics. Hence we have a gain in efficiency no matter what our final case may be. If this became the most reliable way to use the SFG device in the long run: we still have an amazing energy ratio here!

Capacitance mass – energy

The capacitors store a certain quantity (quanta) of charge directly related to the square surface area of the capacitor plates. The more area, the more electron charge mass that can be stored.

This relates to the formula of: $E = mc^2$ Here an increase in the area of the plates which increase the plate mass, gives us more numbers of electrons in mass that can be stored on the plate areas. *Since the electrons transfer their energy motion through a conductor at the speed of light we thus have both the concept of mass and light speed in the ideas behind the capacitances and electron energies. The energy is hence directly proportional to the mass. Where $m \times c^2 = \text{energy}$.* Which is the same scenario as the charge capacity of the typical battery.

Increasing the capacitances with more plate area hence increases mass which in turn increases the energy. A higher powered model will hence be larger and weigh more (have more mass) than the low powered model.

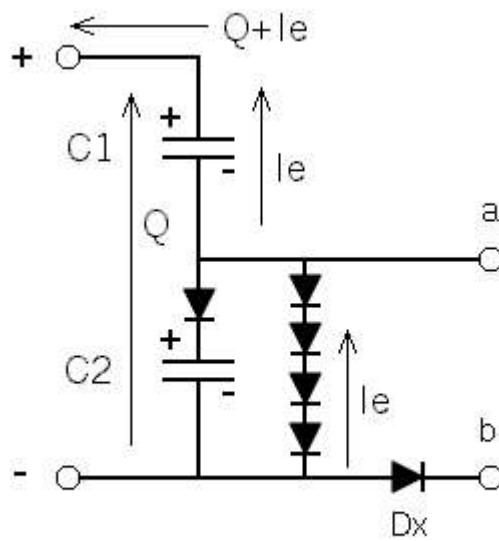
Hence, more charge, more power.

With improvements in capacitor technologies, we now can place allot of energy storage ability into a capacitor. The size has hence come down as well as the leakage current having been further reduced. Hence the ability to accumulate allot of capacitor power into a smaller space than would have been possible ten years ago has now occurred. In fact, improvements in capacitors have been occurring over the past twenty years and at this moment there are patents on even newer capacitance technologies sitting, awaiting market interest to procure the patents and begin manufacturing. Such a technology I have read of recently uses industrial diamond as a dielectric in the capacitor manufacturing process.

One good source for ideal capacitors are the computer grade types which can come in fairly high capacitance values with low leakage currents. We also have the super and ultra capacitor technologies which make possible capacitances in the hundreds of Farads range. *This then makes possible an SFG device in the one kilowatt power output range (with some expense however.)* Of course demand can fuel the manufacturing and hence lead to allot of these capacitors, which will drive the market price down making them more common place and affordable.

A high powered model will fill a cabinet around the size of 4'w x 4'h x 4'd. Thus, this gives you an idea of the dimensions of a high powered model where the inside space is accounted for by being filled with super capacitors. Devices of this size are thus ideal for home use, and when coupled with solar cell technologies we hence would have an ideal kind of alternative energy system setup. A kind of ultra efficient solar energy technology. (One of many interesting applications.)

Summing Charges



Defining Initial Charge

fig 17

When the switch is thrown to turn on the device, charging current from a power supply or battery will begin to flow in the directions shown by the arrow Q.

As C2's voltage drop begins to charge up to the bias voltage of the diode loop then Ie will begin to flow.

The sum of Q C2 and Ie will then become the charge of C1:

$$Q_{C1} = Q_{C2} + I_e$$

This represents the branch of C1 and C2, all of the branches behave in this manner during charge up and this also defines the state of the charges after charge up is complete.

$Q_{C1} = Q_{C2} + I_e$, is the counter balancing charge to the portion of the branch made up of C2 and the diode loop.

At this point, most everything has been discussed and analyzed except for actual leakage currents of capacitors and the recommended diodes: which we will analyze next. From the previous pages you may have gotten various ideas as to how you might use this technology. One of the applications mentioned so far has been that of combining this with solar cell systems. If asked about SFG devices, you can say that “They are a re-application of known text book principles. Where the principles are viewed from a new vantage point and systematized from that new vantage towards a newly realized goal of operation. Without violating the principles of electrical physics. Where everything is based upon known text book physics.”

Leakage Currents

Example

NTE Electronics Inc.

44 Farrand Street, Bloomfield, New Jersey USA 07003
fax: (201) 748-6224

NEV, NEH Series Electrolytic

NEV = Radial Lead

NEH = Axial Lead

Range 0.1 μf to 22,000 μf

6.3V to 100V

leakage current: $I < \text{or } \sim = 0.01CV + 3 \mu\text{A}$

I is less than or approximately equal ($< \sim =$) to $0.01CV + 3 \mu\text{A}$

I = leakage current in μA

C = capacitance in μf

V = rated voltage

Based upon the size of these capacitors which happens to be small, they are nearly classified as super capacitors because of the size versus energy density. They are cataloged as sub-miniature electrolytic capacitors. They come in a good range of capacitances with a low leakage current rating which can be less than calculated, but not over the above calculation.

It is possible for the leakage current to end up less than calculated at lower voltages because the equation is for the full rated voltage of the capacitor. Rather than being directly smaller, it can be geometrically smaller. To extend lifetime, the capacitor rated voltage should be much higher than the voltage used: at minimum, twice the voltage the capacitor will be used at. The lifetime at rated voltage is only 1000 hours +/- 12 hours and this is not much of a lifetime. Although you can find good capacitors with a much better lifetime, these are affordable for test purposes and they demonstrate the low leakage current required for an ideal device. Note: there are capacitors with a lower leakage current rating.

$$I < \text{or } \sim = 0.01CV + 3 \mu\text{A}$$

$$9.2\text{v } C1 @ 381.5 \mu\text{f} = 38.098 \mu\text{A leakage}$$

$$5.7\text{v } C3 @ 1273.7 \mu\text{f} = 75.6009 \mu\text{A leakage}$$

$$2.2\text{v } C5 @ 5004.5 \mu\text{f} = 113.099 \mu\text{A leakage}$$

$$\text{sum } 227.6889 \mu\text{A}$$

$$12\text{v} \times .0002276889 \text{ A} = 0.0027322668 \text{ watt input}$$

$$9.1\text{v} \times .00051 \text{ A} = 0.004641 \text{ watt output}$$

$$\mathbf{0.004641\text{w} / .0002276889 \text{ w} = \mathbf{1.69858961064856:1 \text{ over unity ratio}}$$

The above assumes that the leakage current is equal to the equation and not less than however the rating is less "than or equal to." Thus the actual value may be less and the "over unity scenario" ratio even greater.

A 1.69858961064856:1 over unity ratio equals an efficiency gain of 169.86% efficiency improvement.

From this analysis we can see that the leakage current by comparison in the lower capacitances will be similar however if there is a continuous current running in the loop through a load, then the leakage current of the lower capacitances will take the route of the loop with only the difference values calculated in the upper capacitors being leaked to the power supply.

The good news here is that the the **NTE Non Polarized Axial Lead Electrolytic Series** has an even lower leakage current rating. Hence look them up and calculate for yourself what they will do!

The examples here are merely to show you what you can expect from average but good capacitors even though there are better ones.

Remember that even if you use capacitors that have a large leakage current value, which will compete in the real time with the generated output, you can still measure for the negative voltage at terminal a. with respect to the cathode of Dx for a proof of the principle.

Real Time Analysis

Real time views of the operation of the SFG device, deal with the input from the power supply due to replenishment of losses due to leakage current versus the generated power at output.

You can not measure the power in the device that is stored inside due to the charge from initial energization, since that charge Q is not a moving charge. You can however measure the voltage across the capacitors and calculate the power via the voltage and charge of the capacitance value. We can only measure the moving charge in real time afterwards, that is made up of the sum of the leakage currents of the upper capacitors.

Comment

Once this subject is fairly well understood the push will be on to not only increase the capacitance of capacitors which is already on; in the super and ultra capacitor technologies: but, to also improve leakage current ratings even more. The leakage currents have been improved in the newer technologies yet I suspect that more can and will be done as time goes by.

We are thus now on the cutting edge of things although I have been aware of how this works since the Christmas season of 1985. Only now have there been enough improvements for this to become more realizable. Hence, since 1985 I have seen many desired improvements moving in the direction I needed things to go in.

Diode Selection

Diodes come in various types from small signal detection types to small signal switching and large signal switching, to Schottky barrier types, zenier diodes and variable capacitance or Varicap diodes.

The first consideration is the minimum forward on current, and then the forward on voltage, as well as the value of the forward on voltage drop, and then the maximum forward current rating. Small signal and small signal switching types will work in the circuit we have studied. If the voltage of your selected diodes is less than 0.7 volt the diode loop will set the voltage once the circuit is charged, if the voltage is 0.8 volt per diode then the circuit will have to be redesigned.

Larger power models may use diodes with a minimum forward on current of 50 mA up to a maximum current of several amperes.

I you can not find diodes that are rated with a small minimum forward on current then you will have to use the formulas for design and analysis to design a circuit that will work with the diodes you have selected.

The characteristics of the various diode types are listed in the semiconductor cross reference guides such as the ECG or NTE guides and even the Radio Shack cross reference guide as well as the Radio Shack catalog.

Some good study of the various capacitor manufacturer's products as well as the spectrum of diodes manufactured will need to be done in order for you to make some educated and hence technical choices for the best performance, which is the ultimate objective of the specific and technical design.

These considerations then are for the engineering minded individuals to explore, and this can merely mean a hobbyist with that kind of insight and mindfulness. I am aware of how considerate and technical the ham radio home brew technician can be with their projects and studies. Thus I am confident that such individuals everywhere can grasp the idea herein and begin to build these devices as well as further their development. I would hence like for everyone interested to explore and hence further this, particularly in terms of perhaps leading the manufacturer's towards even further improvements in capacitor performance. Such furthered improvements will make the SFG idea even more efficient in the performance sense, in everyday practical usage terms.

Well at this point the future is before us. I will discuss a few closing concepts through out the rest of this text so that you may be enlightened a little more and then it is all in your hands; where you will become the researcher and developer.

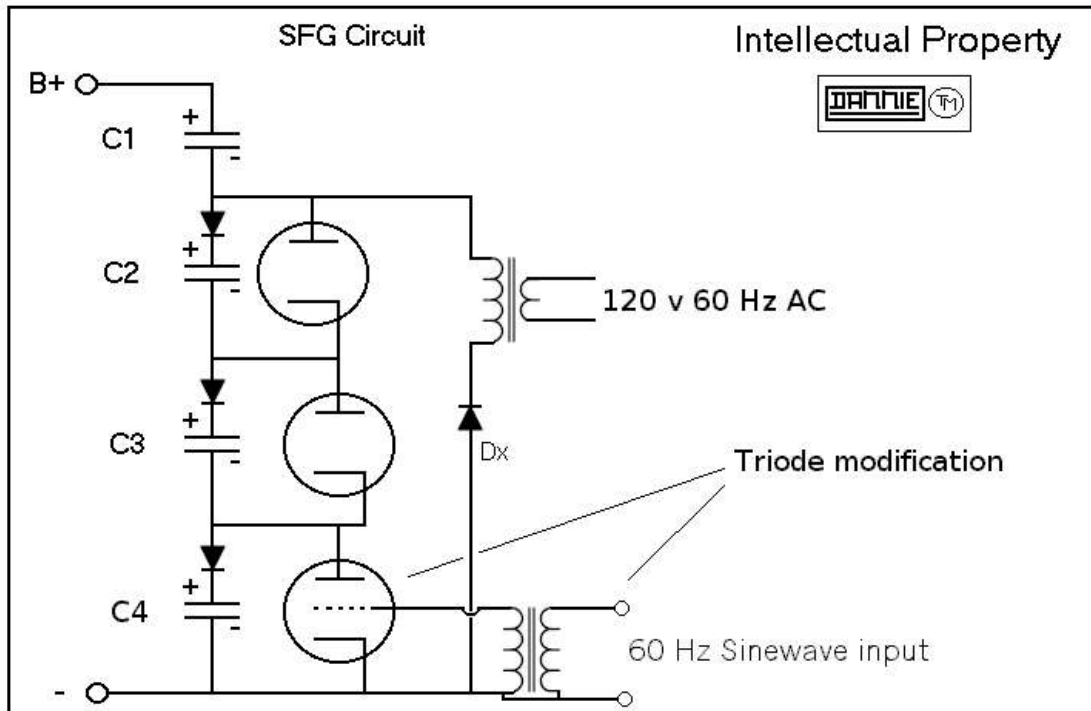


fig 18

Given enough diodes and enough B+ voltage, this idea can produce 120 volt AC @ 60 cycles in the kilowatts range if we use Class C biasing @180° or less conduction angle. At this point I can not say at what conduction angle the Class C bias should be: this is dependent on the flywheel action of the primary of the high voltage step down transformer. The concept here will require some investigation since the primary's flywheel action must produce the negative going half cycle of the wave form.

The circuit diagram is simplified since it does not show any means of control grid bias which means that the ground of the signal input transformer on the control grid side will have to go to a grid bias voltage circuit rather than ground: unless you wish to use Class A biasing experimentally. A line conditioner can follow the 120 volts.

Curious Questions?
 “capacitor energy density”

One of the most commonly asked questions is about the manufacturer's energy density ratings for their capacitors. Capacitance in the physics books is defined as $C = Q/v$ however the energy in joules which is defined as $j = vQ$ is usually expressed as $j = vQ^{1/2}$ by the manufacturers, which in reality, **would change the capacitance** of the capacitor since the **values in the formula have been changed by 1/2**. Note: they do not change the actual capacitance value, so what is up here? This expression holds true if you are discharging a capacitor into a capacitor of the same value such that now half of the energy from the first capacitor goes into the second capacitor of equal capacitance. So do not let this mislead you, neither let any authoritarian personality deceive you who holds to their classical views. Here, we are not using capacitors in the classical way of discharging energy from them, instead we are using their polarized electrical field forces and hence not the charge. **$j = Qv \sim$ holds up here!**

Buffering

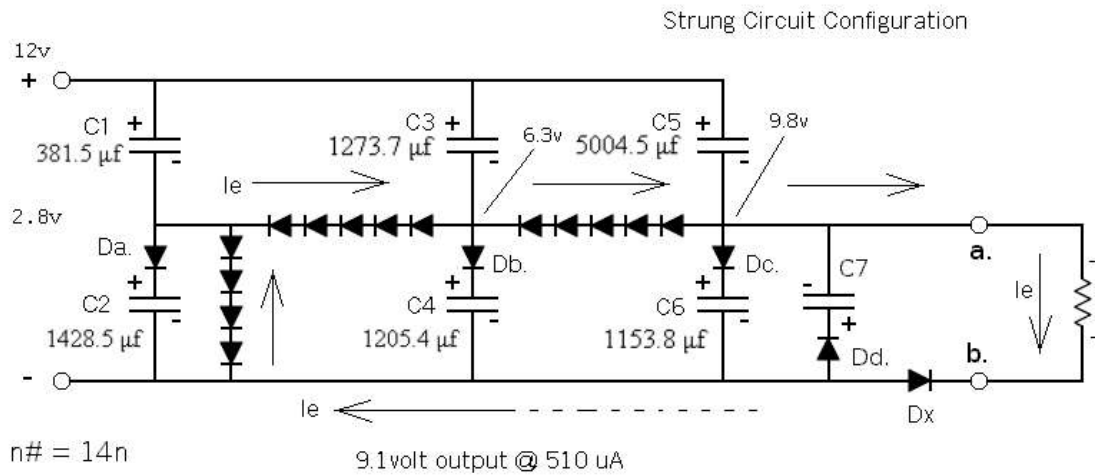


fig 19

$$C7 = I_e / (V_{out} - v_{Dd}) \text{ minimum value}$$

$$V_{out} = 9.8v$$

Once the circuit is fully charged, the electron deposit accumulated up at terminal a. charges the negative plate of C7 which in turn pushes electrons off of C7's positive plate and out through series blocking diode Dd. C7 acts as an electron deposit reservoir and as a buffer capacitor for momentary instantaneous current peaks.

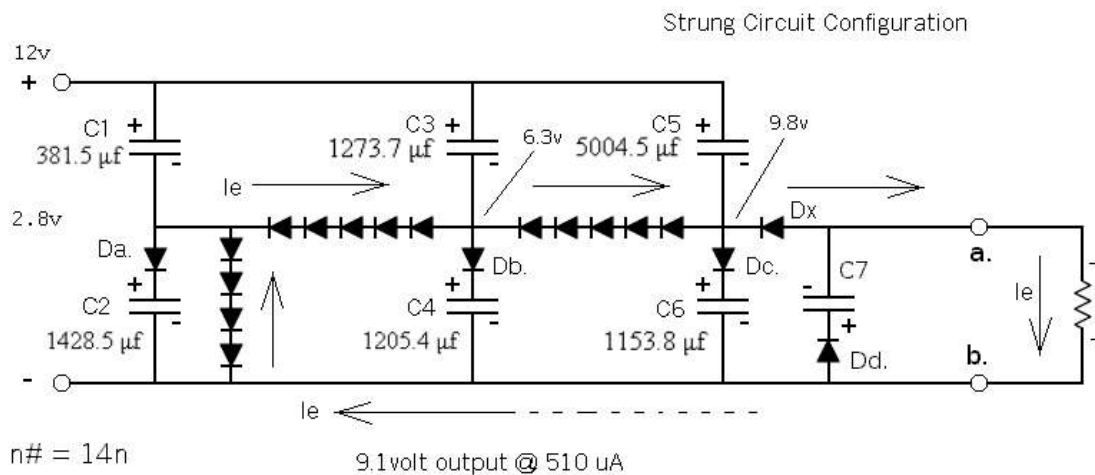


Fig 20

$$C7 = I_e / (V_{out} - (v_{Dx} + v_{Dd}))$$

This example merely shows you another location of Dx which is ideal in this example since C7 draws current through Dx once charge up is completed.

Conceptual Model

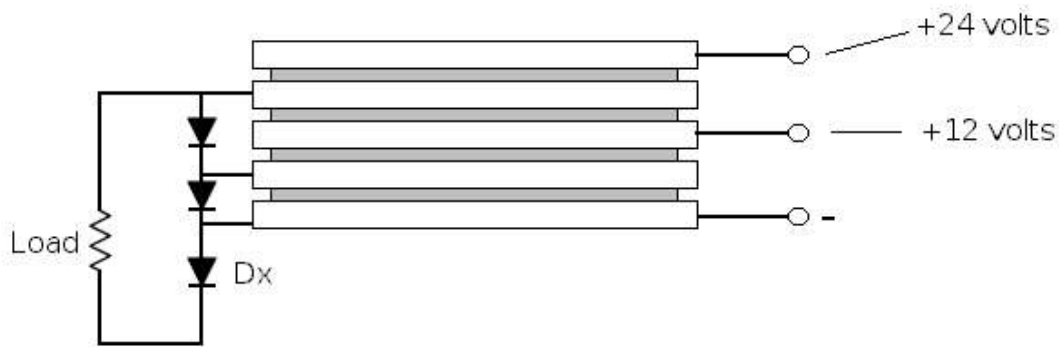


fig 21

It was in the Christmas season of 1985 there about when I detailed all of my concepts in a text I sent to the ARRL in Newington Connecticut. In that text, (which I am not sure of who saw it neither am I sure of what they might have done or not done with it): I disclosed the above illustration along with an electromechanical disc version that utilized a dual composite disc (with inbuilt capacitance) that worked with a highly charged B+ ring physically close to the rim.

The above diagram illustrates what can be flat metal plates with dielectric insulators between each and hence can also be a type of conventional electrolytic capacitor made in the typical wound foil manner. In this diagram there are five plates separated by a dielectric insulator material between each. The power supply charges the plates that have electrodes exiting from the right side of the diagram and the diode loop is to the left and is connected to the plates that are between the charged plates.

This illustrates a type of SFG device that can be built as a typical capacitor where the electrodes to the five plates exit the package and the diodes are added externally. The diodes of the diode loop are illustrated here as single diodes for convenience however in reality they are made up of a series of diodes according to the desired voltage drop required at output. In the above case I am looking at a SFG device with a 12 volt output.

Both this SFG device version and the vacuum tube version depicted in figures 2 – 5 can actually be built and put to use. These devices are hence Intellectual Property, as are all of the illustrated devices in the diagrams of this text.

If you have patience, you can use aluminum foil and wax paper as a dielectric and thus build the above device using the wound foil method and place the device in a large PVC pipe tube for a finished product to experiment with in your home test bench or shop set up. However you are not licensed to manufacture any of these devices without a specific License from me to do so and you may write to obtain that License. There is a considerable fee and royalty involved. Write to obtain a Charter to review and agree to if you so choose to.

The End

September 29, 2005

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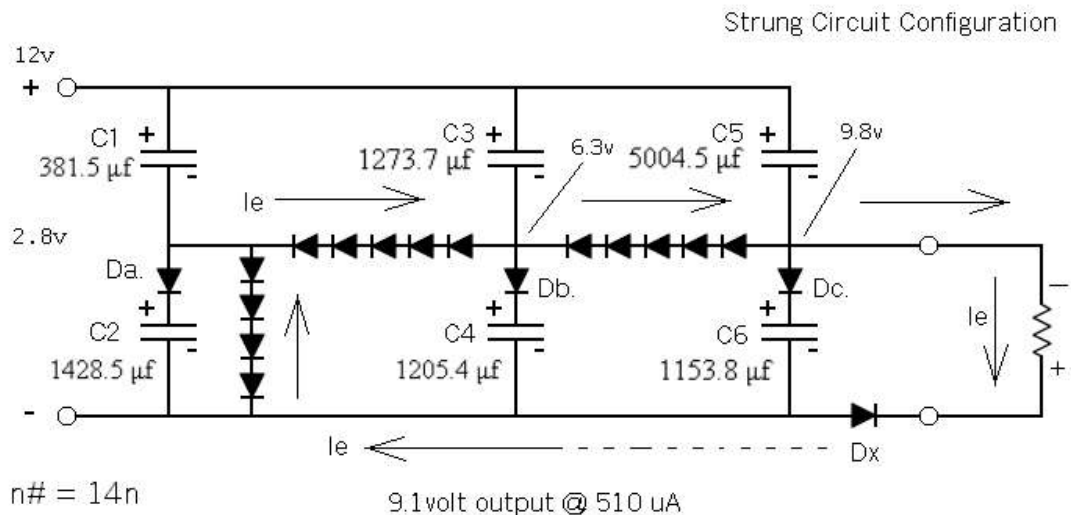
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Parts List

C1 = 381.5 μ f

C2 = 1428.5 μ f

C3 = 1273.7 μ f

C4 = 1205.4 μ f

C5 5004.5 μ f

C6 = 1153.8 μ f

n# = 14n

God Bless Us All In Our Endeavors!
Dan