# Eric Dollard's Analog Computer as a Power Amplifier



Eric Dollard's analog computer is normally used on the bench to emulate a transmission line in one of two different perspectives.

One perspective is looking down along the length of the transmission line. But the perspective I wish to focus on, is the one which looks across the two wires at the space between them and use this as a means of amplifying a weak voltage source.



#### Micro-Cap 12.0.2.0 (32 bit) Evaluation Version - Transient Analysis

Eile Edit Component Windows Options Probe Vertical Horizontal Scope Help





This simulation lacks a switch (to cut off the input power after a fraction of a second). This failure to employ a short duration switch, to protect the voltage source from a backlash of energy swashing into it

from the build up of energy within the circuit, causes the input to *appear to be* quite large when (in fact) it is *actually* very small.

In other words, no current is being drawn from the ground. The circuit is building up all of its energy from within itself overtime (from time) as a reactance taking place within its coils and capacitors working together in conjunction with each other to erupt this phenomenon (which is little understood and largely swept under the rug of electrical science).

The telltale sign that no energy is being drawn from electrical ground neutral is the fact that a large voltage is building up at the source, V1, which is programmed to emit a microvolt sine wave. It cannot emit anything else. Hence, even the exorbitant current occurring there is also suspect. Both the voltage and the current must be coming from the reactance of the circuit. They cannot arise from anything else!



Ergo, reactance is synonymous with "free energy", overunity and "radiant energy". This last term (of radiant energy) was coined by Nikola Tesla and has contributed to the confusion surrounding this topic.

Nevertheless, the power amplifies, continuously, reaching exorbitant levels in less than a millisecond despite the large coils and capacitors.

For this to be the case, the connections among the components probably needs to be welded, because solder joints may contribute too much resistance to allow this exorbitant output to occur.

My simulation of Eric Dollard's analog computer is slightly different in which I have removed the shorts - linking the daisy chain modules together in his version - are lacking in mine.





A substantial reduction in the prices of its touring car models ef-fective after September 1, and a re-duction on the prices of its truck models, effective immediately, has been announced by George W. Mix-ter, president of the Pierce-Arrow Motor Car company. The new price of the standard seven-passenger touring car is \$6,500 at the factory, the inclosed car prices being graded proportionately. The new prices of its truck models are: \$4,850 for the five-ton size: \$4,350 for the 3%-ton and \$3,200 for the 2-ton.



In my attempt to understand the Amman brothers' circuitry, I'm not quite sure how to simulate it in order to verify whether or not my conceptualization is accurate. So, instead of that, I veered into testing whether or not I can simulate Eric Dollard's analog computer in LMD mode in Micro-Cap implementation of Berkeley SPICE (which is a pretty good version of simulators when it comes to realism).

To summarize Eric's concept, what I think is happening is that the capacitors set up the initial condition and then the coils make it happen - the coils execute the commands (are the prerogatives) which the capacitors have set up. That's why they work together as a team. The capacitors decide what they're going to do and the coils make it happen at a cost. But that's reasonable, because nothing is done for free. Yet, that does not mean we have to always come out with less output in contrast to input due to thermodynamic losses. For, it is possible to get efficiency up high enough to make up for the inefficiencies inherently undermining the whole ordeal so that the net result is still over unity to one degree or another.

There's another strange anomaly about Eric's analog computer and that is, that: the coils and

capacitors have to come in pairs. You can't just have one capacitor and one coil as standard theory will teach us is all you need to create an oscillator. But in Eric's situation of his analog computer, it's a little different and I'm still not clear why. So, maybe you can figure it out?

I'll take a guess that when one type of component is charging, the other is discharging at the same time and in phase with each other - or maybe 180° out of phase with each other - but in some sense, synchronous with each other in a manner which is complementary to each other.

So in other words, when a capacitor is discharging, the other capacitor has to be charging with the same wave that the first capacitor is discharging and at the same time - in unison with each other. And likewise for the coils. That's my best guess for the moment.

But here's another guess...

I noticed something interesting about a popular simulator that is available online. They call themselves "every circuit". But that cannot possibly be true, because they leave out the most important component of a free energy device. And that is, a switch - a simple switch.

Switches create surges. And if a surge is repeated fast enough before it dies out, it can amount to something - something substantially more than whatever energy initially passed across that switch.

I suspect that the doubling of capacitors and the doubling of coils (in Eric Dollard's analog computer) is causing a different definition of capacitors than what we are accustomed to. Namely, instead of merely claiming that capacitors charge versus discharge, we have a new reality in which a capacitor switches the direction of current based on whether or not the current is charging or discharging - determining the direction of current into, or out of, the capacitor in question.

A similar reality occurs with diodes in which the diode can switch the preponderance of resistance (whose result is the alteration of the available directions for current) to prevent its passage in one direction while leaving the voltage alone. This is essentially what a switch performs in satisfying its function. In both cases, current is guided into what direction it will pass through just like a train junction can determine what direction a train will take by deciding which track that train will transfer to.

The telltale sign that the capacitors are acting as switches is the fact that the reactive triangular waves (which arise out of the smooth, energetic, sine wave input) can only mean an abrupt switch is opening and closing causing the peaks and troughs of the triangular waves being so pointed instead of smooth or flat like a sine wave or a square wave, respectively.

Does it matter what type of voltage is applied to the helium canister? I don't know... I would expect that it must be a varying voltage source of either a square wave (as in the case of the Joseph Newman device... <u>Vin Yasi's answer to Has anyone tried to recreate Joseph Newman's perpetual motion machine?</u>), or else it might be a sine wave. But what if it's not necessary to have a varying voltage source? Then, we could save the voltage from becoming a drain of amp-hours by placing a blocking capacitor in front of at least one terminal of the battery so as to \*borrow\* the voltage to stimulate the helium. Or, we could use a precharged capacitor instead of a battery?

# Appended Updates - 22 April 2020

I've made some updates, in the sense that, I have added a capacitor in parallel to the inductive load on the far left of the schematic. And I also added another resistor at the input side of the circuit on the right-hand side. Both of these additions have helped to stabilize the simulation of the circuit (free from simulation error of a specific type: "matrix is singular") which, I would imagine, is equivalent to making the circuit more realizable - in other words, more likely to be buildable.

What follows is a copy of the text which I include in the notes to the simulation (housed within the zip file whose URL is in the upper left-hand corner of the schematic).

I've also included screenshots of this circuit's improved, version five, which immediately follows these notes...

Does it matter what type of voltage is applied to the helium canister? I don't know... I would expect that [...snipped for brevity...] so as to \*borrow\* the voltage to stimulate the helium. Or, we could use a precharged capacitor instead of a battery?

I suspect this latter possibility was (indeed) what technique Tesla employed in 1931.

But there were two versions of helium driving an EV. The one initiated by the Amman brothers in 1921 and Tesla's replication and improvements of 1931.

So, let's begin at the beginning...

I want to believe that Tesla made two EV conversions: one in 1931 and another in 1897 which are very similar in many respects but are different in that the latter of the two is far simpler. The 1931 version (I think) is a replication of the Amman Brothers of 1921 with a few modifications in the direction of improved efficiency but fundamentally the same.

Essentially, I think what the Amman brothers did, was connect their DC dynamo generator (that was intended to recharge their 6V car battery) in parallel with the two bronze spheres located in the headlight sockets of their car (after having removed the car's headlights). These spheres were filled with helium and opened up to an interconnecting bronze tube (also filled with helium) which bent around in a U-shape inside a steel drum tied to the front end of their car. The steel drum contained a stack of pancake coils whose center is threading the bronze tube. The pancake coils are not wound with copper wire, but are wound with iron wire. The diameter of the pancake coils and the quantity of them (stacked) might be inversely proportional to the voltage difference applied to the bronze spheres? These pancake coils are intended to extract the magnetic field coming out of the helium tube at their center. At least that's my guess.

The diode rectification (of the output of automobile alternators installed in cars after 1960) is removed (in this case) so that an alternating voltage can be fed to the bronze spheres.

The voltage feeding the bronze spheres has to be a variable voltage - either DC voltage with a commutator creating a square wave, or else some other waveform that changes its voltage over time to employ frequency, because the frequency will modify the rate of electrical reactance of the helium.

The above would be a description of the Amman brothers' version of 1921.

But what follows is the modification (or at least some of them) which Tesla may have managed to make 10 years later...

Since a variable voltage is required to stimulate the helium to create an electromagnetic current, there is another way to do this...

I suspect that Tesla had placed a capacitor inside his 2 foot long by 1 foot wide wooden project box that sat to his immediate right on the front bench seat of his 1931 Pierce Arrow. And this capacitor was pre-charged to a very high value (let's say 1000V to pick a number out of a hat). And this was connected to a bronze tube containing helium at the center of the pancake-shaped, stator coils of the motor (wound with iron wire) at the front end of the car connected to his wooden project box with two

very heavy cables. I want to believe that the reason why these cables were heavy was due to the fact that they were coaxial cables with heavy-duty insulation and the coax was grounded to the chassis of the car.

Well, something else was connected to the chassis of the car and that is (of course) one of the two terminals of the battery (which in those days would've been the positive terminal - if I'm not mistaken).

In any case, it's crucial that the voltage of one of the two helium containers is varied (one of the two terminals at the very least) with respect to the voltage of the other helium container which can remain constant so that the net result is a net, variable voltage.

I believe this is the purpose of the aerial connected to the back end of the Pierce Arrow 1931 demonstration. In that, the aerial was connected to the chassis of the car and the chassis was charged with the electrical ground neutral of the battery electrical system (or at least the electrical system of the motor driving this car).

Since the chassis of the car is considered electrical ground neutral (and a floating ground), this ground neutral is allowed to vary (slightly) over time due to the ionization forming around the aerial at the back end of the car draining off (or leaking off) some of the voltage of the car at a variable rate due to the flow of air blowing across that aerial (and other variable factors, such as: variable humidity, etc) causing a random variation of bleed off (from the electrical ground neutral represented by the chassis of this car).

Since the car's chassis is considered to be electrical ground neutral, then this makes this one of the two terminals of voltage charging Tesla's stator coils (with helium cores) which means we automatically have a variable voltage without having to actively vary this. Instead, we're passively accomplished the same thing and will get the helium to react in a variable manner so that a current can develop in the pancake, stator coils (surrounding the helium canisters) which are extracting the magnetic field (which emanates from the helium).

To clarify...

In both instances: either Tesla's replication of the Amman brothers' EV conversion, and the Amman brothers' original variety, we have two options for varying voltage input.

One method may be to voluntarily vary the voltage (such as I do within this simulation) with either a sine wave generator (or a radio tuner fed from an aerial), or else use a commutator arrangement on the output of a pre-1960s dynamo DC generator, or an alternator erupting AC sine waves (after removal of its diode rectification).

Another method would be to input a steady-state, DC voltage and vary this input (ever so slightly) by using an aerial connected to the electrical ground neutral of the chassis of this EV conversion (in Tesla's case), or expose the surface of the helium canisters (or a portion of them) to the air (in the Amman brothers' situation: they exposed the front face of their two bronze spheres seated in the headlight sockets of their car).

Screenshots, follow...

Schematic...



#### Nodal voltages...





Output voltage and current at the coil on the far left, L1...

Input voltage at a voltage source, V1, sine wave generator (keeping in mind that this generator is programmed to input a one microvolt, sine wave at 300,000 Hz)...



#### Input current at V1...



Erasure of input voltage followed by the escalation of input current...



Erasure of input voltage...

Micro-Cap 12.0.2.0 (32 bit)	) Evaluation Version - Transient Ana	alysis			
e Edit Component Windows C	ptions Probe Vertical Horizontal Scope	e Help			
	0 % 回國 X 回 [] + ~~+	★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★		③ □ 12 雪 ※ [四 12	
🖬 Transient Analysis					
	🕑 🖉 T 😤 🕨 💷 🛛 🗷 🗷				14 3 3 7
III - A 唱 唱					
1.005		Micro-Cap 12 Eva ammanbro	luation Version s-v5.CIR		
1.000					
FD(	<b>NA 10 0</b>	06 MIII I	ICECO	NDC TO	
I'IN(	JIVI 17.7	JU WILLL	I SLUU	INDS IO	
0.60p					
20 N	VIILLI S	ECUND	S. NU IP	NPUI	
0.20p	TAGE	AT SINI	$\mathbf{F} \mathbf{W} \mathbf{A} \mathbf{V} \mathbf{F}$	CEN	
-0.20p					
0.600					
-0.000					
-1.00p	20.00m	20.00m	20.00m	20.00m	20.00m
<u>V(V1) (V)</u>		T (Sec	s)		
ECID +	Í.				
manbros-v5.UIH Transient Analysi	2				

Escalation of input current...



Transition of input sine waves morphing into triangular waves over a duration of 57 microseconds. These triangular waves are an indication of a sharp switching action is taking place overriding the smooth sine waves from which these switchings are derived...



Slightly out-of-phase sine wave input during the initial four microseconds at voltage source, V1...





Slightly out-of-phase sine wave input during the initial 20 microseconds at voltage source, V1...

And last but not least, in-phase triangular wave input during a period of time spanning 54 to 57 microseconds at voltage source, V1...



I find it remarkable that, despite the slightly out-of-phase sine wave input (which can be expected resulting from an inductive component, such as a sine wave generator), this input quickly turns into triangular waves which are 0° out-of-phase with each other (between the current component of electricity and the voltage component of electricity).

This is noticeable, now, initially, but is not evidenced - later on - as the overall power escalates. So, there must be some sort of complication arising which messes this up?

More updates...

#### 4 May 2020 - 10:38PM PDT

I discovered an old simulation of mine which I feel is worth posting here...



It uses two op amps (powered by a voltage difference of +/- 6V to reflect what size battery was used in automobiles nearly 100 years ago) to serve as an equivalent replacement for the helium inside of the Amman brothers' hollow, bronze spheres.

This simulation uses a transformer to model a D/C motor whose magnetic coupling coefficient - between the rotor and the stator - is not less than 90%. A capacitor, precharged with one volt, is used to kick-start this simulation into its ON mode.

There is an air-cored, shorting coil between the two transformer coils which is intended to be adjustable to serve as a throttle for this motor-transformer. Lowering this shorting coil's inductance raises the amperage of the motor-transformer (as measured by its two parallel diodes).

Voltage is somewhat steady at around one volt despite there is no limit to how high the amperage may ascend to.

## QUESTION

But it uses batteries all the time or get it's energy from external source?

# ANSWER

Battery, precharged capacitor or electret or solar panel.

But the beautiful part is that, if it is a battery, a blocking capacitor can be placed inline at one terminal to block DC drainage of amp-hours.

What I found from simulating this last condition is that the influx of negative current tends to be slightly greater than the outflow of positive current making this an ideal setting for "topping off" the batteries with a trickle charge.

Since this style of circuitry does not require an external power source, but does require an external source of stimulation, care must be taken to restrict external sources of power to protect them from overload arising from reactance within the circuit. Reactance can look like a sponge sucking energy from out of a source of voltage if allowed to do so without restrictions. But in reality, reactance is stressing out its energy source with a fictional demand made upon it. It is this demand, born of reactance, which broadcasts energy outward towards the environment giving the appearance of making demands when - in fact - it is this imposition which is a burden to both the environment and its interface, namely: the so-called voltage source.

This is why reactance has been the bane of electrical engineers. For there are two sides to reactance: both good and bad. We have to take care to restrict our use of reactance to a reasonable amount which helps our appliances rather than destroys them!

#### Comment

There is no ignorance about free energy. The thing is, that the term used by pseudoscientists, means something different in real science.

From Wikipedia: "The thermodynamic free energy is a concept useful in the thermodynamics of chemical or thermal processes in engineering and science. The change in the free energy is the maximum amount of work that a thermodynamic system can perform in a process at constant temperature, and its sign indicates whether a process is thermodynamically favorable or forbidden."

However there is no such thing as getting energy out of thin air? 😉

#### Response

Correct. Free energy is not kinetic. It is potential taking the form of electrical reactance derivable from the manipulation of time (frequency and phase relations) or else it is not freely available.

In other words, space imposes the limitations of thermodynamics upon energy.

Meanwhile, time imposes the limitations of logarithmic rates of expansion or contraction upon reactance.

Overall energy is homogeneous in as much as all gains and losses are accounted for resulting in "no free lunches" of energy.

Yet, reactance cannot maintain itself. It must inflict self-induced alteration of amplitude (via alterations of frequency) whose resultant is the same amplitude per greater or lesser unit of time giving the illusion that energy has been manufactured (per units of time) out of thin air. Our mistaken assessment is due to our misdirection of attention to details.

It's interesting to note that all changes to current arises from the inductive reactance of coils and the capacitive reactance of capacitors indicating that current cannot become a steady state.

Only voltage is capable of a steady state.

Air is adequate as a reactant stimulus and inadequate as a source for power.

The distribution of power to satisfy anyone's need hides the freedom of energy independence predicated on the in-house reactant expansion or contraction (per unit time) of whatever scant or abundant energy is already available at any location. Hence, free energy is available "whenever" energy is available without any imperative consideration for its location if reactance is used as the tool for leveraging time.

Location is an irrelevant consideration whenever reactance is concerned.

So, I don't even consider "thermodynamic free energy" for that would evade its true causation within the realm of time.

Reactance is incapable of performing any work. Yet, reactance is not useless once power factor correction is applied.

The simplest power factor correction results from the resistance of a spark gap - to give, but one example.

#### OBJECTION

That makes no sense. Free energy in thermodynamics doesn't have to do with reactance.

## RESPONSE

Exactly my point!

But that's only one of my bullet points.

The other main bullet point is that reactance is highly underrated as another form of free energy, not at all pertaining to thermodynamics, yet (still) free energy - just the same, but functioning under different rules of logarithmic, organic life-form, growth rates (and decay rates) operating outside of thermodynamic laws, because it's not energy - it's reactance. But *it is free*, because it doesn't take as much energy to spawn a reactance as much as the outcome of the reactance becomes. They are not equivalent. It's as if reactance is pre-destined to respond to a catalyst - and *only respond to a catalyst* - unlike energy which requires a much larger push (or pull) to get it to move based on the inertia of matter (which energy is tied to, yet, reactance is free of).

That's it! Reactance is free of the inertia of matter due to the fact that reactance does not operate within the realm of space. It operates within the realm of time, alone, (excluding space) since frequency and capacitance and inductance are not spatial considerations directly involving themselves with space - despite the fact that we have to use spatial materials to create capacitance and inductance (but not frequency since frequency has nothing to do with space despite the wavelengths of frequency resulting in space as a consequence to frequency existing in time). Hence, reactance does not require the same level of stimulus to get an equivalent outcome as does energy require.

This is true biology in electrical engineering! What a thought...

Thank you for your comments! You helped me grow in my understanding which could not have happened, otherwise... We must have magic together, here, to figure this thing out!?

#### To recapitulate...

Reactance is underrated and thermodynamics is overrated as if thermodynamics is attempting to hush up the existence of reactance and promote thermodynamics as the be-all, end-all explaining everything (which it does not explain) without reactance helping to explain the other half of electrical reality (which thermodynamics conveniently overlooks).

# QUOTE

"Reactance simply can't be used to gain any energy or of it. What you put in is exactly what you get out."

# RESPONSE

To give a few examples of refutation...

Inductive Reactance Formula...

```
Inductive Reactance = Frequency \times 2\pi \times Inductance [1]
```

Since...

```
Initial Inductance = Inductance for the Subsequent Iteration per Unit of Time [2]
```

Hence...

Inductance for the Subsequent Iteration per Unit of Time = Inductive Reactance [3]

```
Substituting [3] into [1]
```

```
frequency \times 2\pi \times inductance = a
```

```
frequency \times 2\pi \times a = b
```

```
frequency \times 2\pi \times b = c
```

```
frequency \times 2\pi \times c = d
```

etc...

Hence...

Inductive Reactance is a self-looping (self-feeding) phenomenon leading to either logarithmic growth or logarithmic decay of potential energy (not kinetic energy) in the form of logarithmic growth or logarithmic decay of frequency with an indirect consequence leading to the alteration of kinetic energy depending upon how frequency impacts kinetic energy. Kinetic energy is never directly involved with electrical reactance or else there would be a term for it within reactance formula. Inductance, capacitance and frequency are not expressions of kinetic energy, but are parameters which impact kinetic energy making inductance, capacitance and frequency potential parameters of energy.

Hence...

This self-feeding phenomenon does not require a constant throughput of energy in order to satisfy the "energy IN equals energy OUT" criteria of thermodynamics. Yet it does require some input of energy, but not an equivalent throughput of energy, since the phenomenon of self-looping will expand or contract the initial energy (whatever it is), because the energy of reactance is irrelevant to the process of reactance. Only inductance, capacitance and frequency are variable parameters which pertains to reactance. The parameter of energy (kinetic energy) does not pertain to reactance.

Hence...

It theoretically does not matter how much energy is resident within a system in order for reactance to occur. But in actual practice, it does matter since the presence of too much energy tends to override reactance suppressing it from occurring.

For example, this initial tracing (of a virtual oscilloscope) exhibits a reactant triangular wave arising from a tiny sine wave stimulus...

http://vinyasi.info/energy/ammanbros-v5-coil-output-current+voltage-shows-transition-between-outof-phase-sine-waves-and-in-phase-triangular-waves-during-57-micro-seconds.JPG

Which quickly expands its amplitude...

http://vinyasi.info/energy/ammanbros-v5-coil-output-current+voltage-are-in-phase-with-triangularwaves-between-54+57-micro-secs.JPG

Until it reaches humongous proportions...

http://vinyasi.info/energy/ammanbros-v5-coil-output-current+voltage.JPG

Another example...

http://vinyasi.info/energy/build-up-of-a-surge.jpg

This tendency (for the suppression of reactance) can be compensated by increasing frequency or inductance or capacitance.

For example...

http://vinyasi.info/energy/ammanbros-v5-schematic.JPG

Since our suppression of reactance is what we tend to do (by giving massive voltage to our electric motors in electric cars for example), only the thermodynamic expenditure of energy is allowed to occur without any possibility for reactance to modify the energy of the system.

Hence...

We know a creator by analyzing his creation. Since we suppress reactance within the circuitry of an EV (for instance), it follows that suppression of reactance is encouraged to the benefit of thermodynamics and to the detriment of reactance.

It could be claimed that this is for reasons of safety (since playing with reactance is equivalent to playing with dynamite - the electrical behavior of an explosion is no different than the electrical phenomenon of reactance). But this is not a satisfactory reason for suppressing our awareness of whatever potential savings could accrue in the production of energy.

This constitutes the suppression of free energy.

# **OBJECTION**

Your formulas make no sense. Inductance is a property of a coil and it doesn't change with each "iteration". I don't even know what you mean by that. Probably wave period? Where did you get these equations from?

# RESPONSE

It is implied from a subsequent entry of the same article...

$$X = X_L + X_C = \omega L - rac{1}{\omega C}$$

Inductance for the Subsequent Iteration per Unit of Time = Inductive Reactance [3]

Unlike static values for energy, each calculation of reactance must be re-evaluated per each unit of time since reactance is modified by frequency, inductance and capacitance and energy plays no active role in it. Energy becomes the passive resultant of reactance.

## **OBJECTION**

Also your "simulations" don't make sense. Less current than voltage? What? Current and voltage have different units. They are not comparable. It's like saying more time than weight.

# RESPONSE

Less units of amperage than units of voltage to accommodate unique motor loads (designs)...



# **OBJECTION**

"Inductance is a property of a coil and it doesn't change with each 'iteration'. I don't even know what you mean by that. Probably wave period?"

# RESPONSE

The <u>electrical length</u> of the wave period. Since the outcome of the frequency alters over reactive time, the electrical length of the wave period will also change over time. This is what gives rise to a logarithmic growth or logarithmic decay rate of change to the resultant energy already resident within the system yet acted upon by that system's reactance as a passive parameter.

# **OBJECTION**

Inductance is a property of the coil that doesn't change unless you change the geometry of the coil.

# RESPONSE

The coupling coefficiency among coils effectively alters their mutual inductance which effectively impacts their individual inductances which also affects the parallel capacitances of each coil.

Speaking of his transformational generator, Jim Murray had this to say (paraphrased by me)...

An assisting torque arises from the heightened resonance of the addition of capacitances when the circuit already possesses resonance prior to the addition of these capacitances.