Explaining How The GAP Generator Operates

AC Coupling Rejects All DC:

This page contains information about AC and DC Coupling used with oscilloscopes. Note the **hi-lighted portions**. While in AC Coupling, an oscilloscope will **not** recognize DC signals. So, if The GAP Generator was not using AC, the signals wouldn't even appear on the scope. Therefore I believe it's reasonable for me to claim the best way to measure the **input** power is using AC Coupling.

Difference Between AC & DC Coupling Oscilloscopes

Most oscilloscopes have two types of input coupling to handle both alternating current and direct current signals; typically, a switch lets you select AC or DC to suit your measurement needs. When you set an input to DC coupling, the oscilloscope displays both AC and DC signals, although AC signals may pose a problem. By switching to AC coupling, the scope displays only AC signals; this simplifies measuring certain electronic circuits.

DC Coupling

The DC coupling setting provides a direct electrical path into the scope; it accepts all types of signals, including unchanging DC voltages, time-varying DC voltages, AC, and combinations of AC and DC. In the last case, technicians call it an AC signal with a DC offset. Sometimes, DC offsets can be bothersome; the total signal voltage may push the signal past the top or bottom of the display, hiding the parts you want to see. However, under most other circumstances, DC coupling is all you need.

AC Coupling

With AC coupling, the oscilloscope's input has a capacitor in the signal path, removing DC offset from any mixed signal and letting you see the AC part more easily. For example, some transistor and vacuum-tube amplifiers have a significant DC offset; removing it with AC coupling helps you troubleshoot these circuits. Although it is most helpful with mixed signals, AC coupling also works with pure AC signals. Because it blocks DC, it is not suitable for DC signals.

Keep the above information in mind.

What is an inverter:

The following article describes in a fantastic, yet simple way, exactly how The GAP Generator operates. **The first hi-lighted portion** describes exactly what is being done by the relays, and that is to convert the DC to AC. **The second hi-lighted portion** makes reference to the square waveform you get with a basic inverter. The GAP Generator produces a waveform just like this.

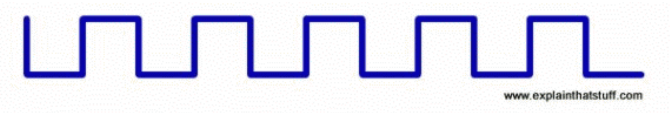
What is an inverter?

One of Tesla's legacies (and that of his business partner George Westinghouse, boss of the Westinghouse Electrical Company) is that most of the appliances we have in our homes are specifically designed to run from AC power. Appliances that need DC but have to take power from AC outlets need an extra piece of equipment called a **rectifier**, typically built from electronic components called diodes, to convert from AC to DC.

An inverter does the opposite job and it's quite easy to understand the essence of how it works. Suppose you have a battery in a flashlight and the switch is closed so DC flows around the circuit, always in the same direction, like a race car around a track. Now what if you take the battery out and turn it around. Assuming it fits the other way, it'll almost certainly still power the flashlight and you won't notice any difference in the light you get—but the electric current will actually be flowing the *opposite* way. Suppose you had lightning-fast hands and were deft enough to keep reversing the battery 50–60 times a second. You'd then be a kind of mechanical inverter, turning the battery's DC power into AC at a frequency of 50–60 hertz.

Photo: A typical electricity inverter. This one is made by Xantrex/Trace Engineering. Photo by Warren Gretz courtesy of US Department of Energy/NREL (DoE/NREL).

Of course the kind of inverters you buy in electrical stores don't work quite this way, though some are indeed mechanical: they use electromagnetic switches that flick on and off at high speed to reverse the current direction. Inverters like this often produce what's known as a square-wave output: the current is either flowing one way or the opposite way or it's instantly swapping over between the two states:



These kind of sudden power reversals are quite brutal for some forms of electrical equipment. In normal AC power, the current gradually swaps from one direction to the other in a sine-wave pattern, like this:

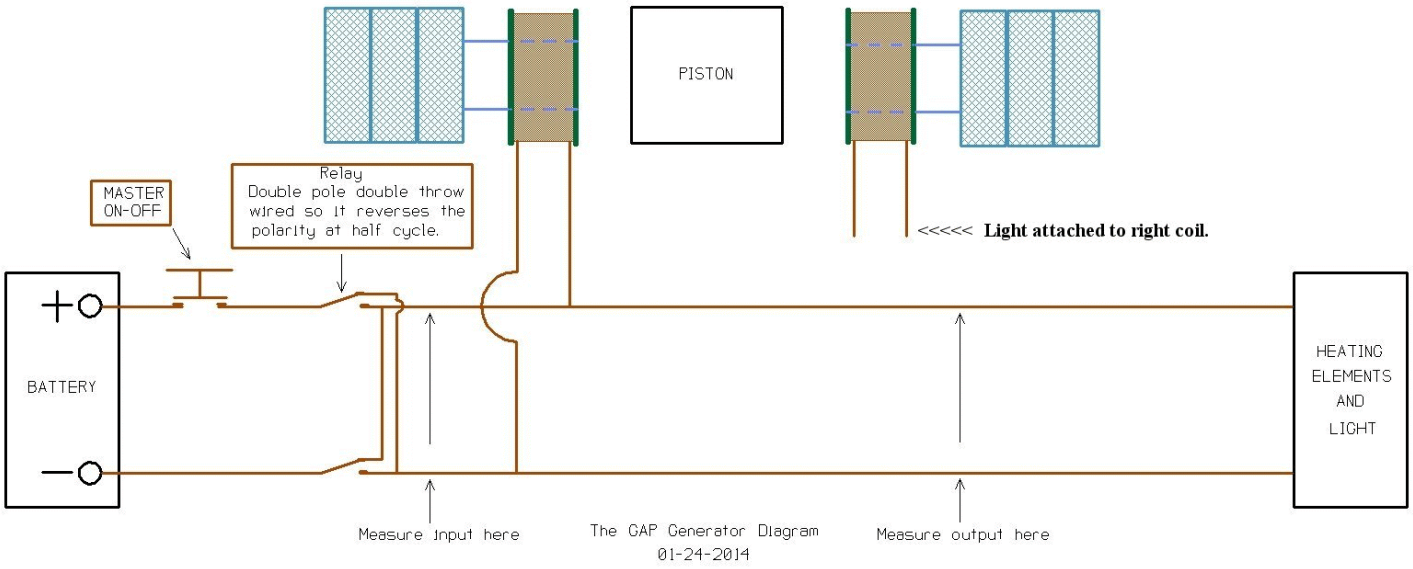
Electronic inverters can be used to produce this kind of smoothly varying AC output from a DC input. They use electronic components called inductors and capacitors to make the output current rise and fall more gradually than the abrupt, on/off-switching square wave output you get with a basic inverter.

Inverters can also be used with transformers to change a certain DC input voltage into a completely different AC output voltage (either higher or lower) but the output power must always be less than the input power: it follows from the conservation of energy that an inverter and transformer can't give out more power than they take in and some energy is bound to be lost as heat as electricity flows through the various electrical and electronic components. In practice, the efficiency of an inverter is often over 90 percent, though basic physics tells us some energy—however little—is always being wasted somewhere!

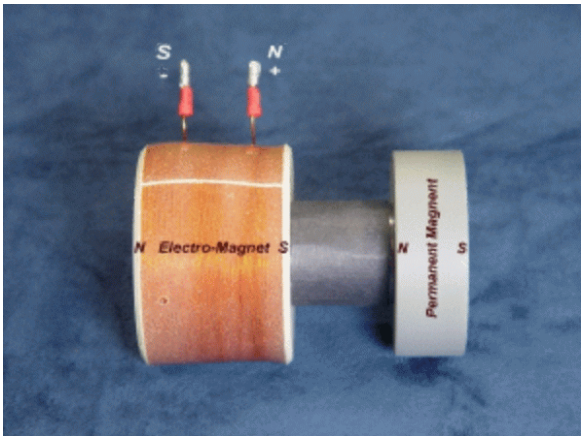
Be sure to absorb in your mind th hi-lighted portion which states, "**Suppose you had lightning-fast hands and were deft enough to keep reversing the battery 50-60 times a second. You'd then be a kind of mechanical inverter, turning the battery's DC power into AC at a frequency of 50-60 hertz.**"

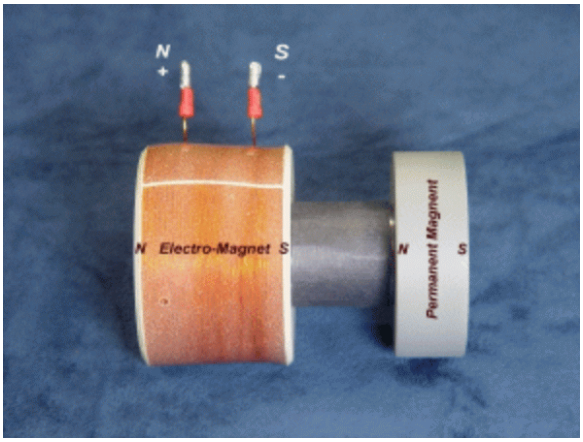
60 hertz is a relatively modern term which replaced **cycles per second.** 60 hertz is the same as 3600 rpm. Well the GAP Generator operates in the neighborhood of 600 to 660 rpm. Not up to 60 hertz but, none the less it's still AC. Something called **Extra Low Voltage AC.** Do a little research on that.

The sketch below shows the wiring diagram for The GAP Generator. My mechanical inverter is the relay. It turns the battery's DC power into AC power.



Below are two photos of the same coil. They are the photos in the gif playing on the home page of [www.gap-power.com.](http://www.gap-power.com) They've been there from day one. Note how the polarity is switching back and forth as the double pole double throw switch described above.





Now, remember on page 1, how it describes the difference between AC Coupling and DC Coupling? Well, it states that AC Coupling wont measure DC but, DC Coupling measures both DC and AC. And, that under most circumstances, DC Coupling is all that's needed. Most circumstances. **Not all.** Look closely at the wiring diagram of the GAP Generator and see how it all ties together. From the batteries to the contacts of the relay the power is DC. At that point it changes to AC. So AC power is being input to the coils. This AC power then becomes mixed with the power being produced by The GAP Generator. Some of which is DC. So to use DC Coupling to measure the input to the coils from the batteries would include the DC produced by The GAP Generator. Overstating the amount of power it takes to operate The GAP Generator. To prevent this from happening, I use AC Coupling for the input power from the batteries and DC Coupling for the output of The GAP Generator. The next page shows the set-up for the oscilloscope.

Oscilloscope Settings
Set-up #10

Input:
Display:
CH1 = Cycle RMS
CH2 = Cycle RMS
Trigger Menu = Edge, Ch1, Rising, Normal, AC Coupling.
Ch1 Menu = AC Coupling.
Ch2 Menu = AC Coupling.

Output:
Display:
CH3 = Mean
CH3 = Mean
Ch3 Menu = DC Coupling.
Ch4 Menu = DC Coupling.

The reason for this is, **I know** that **AC** is what is going into The GAP Generator, so that's all I need to check. In Cycle RMS AC Coupling the scope will only read AC. The piston action **is** producing AC. I know this because that's how I checked it. If it had not been AC, the scope would not have measured it. Some of the AC on the scope could be including this also. If that be the case, then the input to the coils from the batteries is even less. I believe the DC is coming from the coils when they're de-energized. I think this to be **back emf**. I used DC Coupling to measure the power coming from the coils.

I did two test to check this.
Test 1:
Used AC Coupling for measuring input CH1 and CH2. The input power was **201.97** watts.
Test 2:
Used DC Coupling for measuring input CH1 and CH2. The input power was **288.31** watts.
86.34 watts more input. Or at least it appeared so. The scope including the DC power from what I believe to be from the coils. On 01-28-14 at 20:16, I did a test to measure the output power coming from the coil when it is de-energized. It measured **79.80** watts for both coils. A difference of 6.54 watts. In test 1 the rpm was **623.** Test 2 was **619.** The test to measure the output power from the coils was 100 milliseconds. That's equivalent to **600** rpm. That could be why the difference. I really don't know. But, I think the numbers are close enough to make this claim of how to measure the input and output.

The two tests I did are named:
Two Cylinder to heating elements 04-24-15-06-06
Two Cylinder to heating elements 04-24-15-06-12

The following page contains the results of those test.

Photos of the two test showing the difference in the input power to The GAP Generator.

The GAP Generator	
04-24-15 06:06	
Two Cylinder to heating elements left coil only	
Amplification and Neutralization. 623 rpm.	
201.97	Average watts to GAP Generator from batteries.
252.01	Average watts output.
124.78	**Percent of unity.**
50.04	**Average watts over unity. Left Coil only.**
100.08	**Average watts over unity for both coils.**
	Input volts and amps measured coil side of relay. Cycle RMS. This demonstrates exactly what The GAP Generator is doing. I think it's the best way to check it.
	Set-up # 10. Cycle rms input DC mean output

The GAP Generator	
04-24-15 06:12	
Two Cylinder to heating elements left coil only	
Amplification and Neutralization. 619 rpm.	
288.31	Average watts to GAP Generator from batteries.
255.94	Average watts output.
88.77	**Percent of unity.**
-32.37	**Average watts over unity. Left Coil only.**
-64.74	**Average watts over unity for both coils.**
	Input volts and amps measured coil side of relay. Cycle RMS. This demonstrates exactly what The GAP Generator is doing. I think it's the best way to check it.
	Set-up # 10. Cycle rms input DC mean output
	DC COUPLING ON CH1 AND CH2 MENU

The following is a good description of back emf.

Counter-electromotive force

From Wikipedia, the free encyclopedia

The **counter-electromotive force** (abbreviated **counter EMF**, or **CEMF**),[1] also known as the **back electromotive force**, is the voltage, or electromotive force, that pushes against the current which induces it. CEMF is the voltage drop in an alternating current (AC) circuit caused by magnetic induction (see Faraday's law of induction, electromagnetic induction, Lenz's Law). For example, the voltage drop across an inductor is due to the induced magnetic field inside the coil, and is equal to the current divided by the impedance of the inductor.[1][2] The voltage's polarity is at every moment the reverse of the input voltage.[1][3]

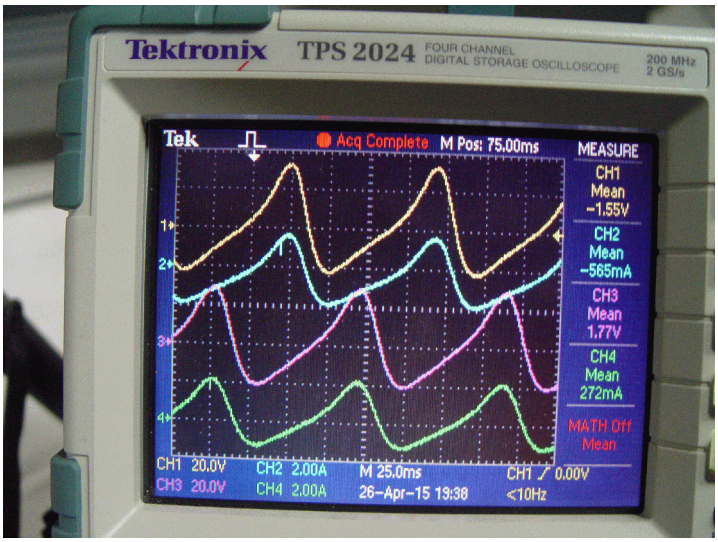
The two photos below are good examples of counter-electromotive force, *(back emf)*. This is taking place in the GAP Generator. Looking at the date and time one can tell they were done one after the other.

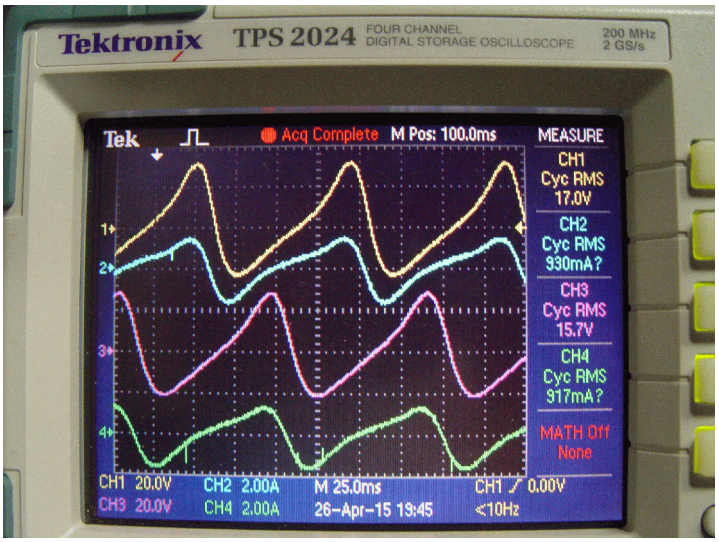
The GAP Generator	
04-26-15 20:04	
Output when coil is de-energized	
Simulator at 100 millisecond cycle time	
12104.704	Watts produced in last half of cycle.
24.21	Average watts produced over last half of cycle.
48.42	19.95 x 2 because the coil is de-energized two times per cycle. Once at start of cycle and again at mid-cycle.
96.84	39.90 x 2 for two coils.
	Output measured between coil and light.
	Set-up # 7. Cycle RMS all channels.
	AC Coupling everywhere.
	One 36 VDC 60 watt forklift light.

The GAP Generator	
04-26-15 20:08	
Output when coil is de-energized	
Simulator at 100 millisecond cycle time	
17894.912	Watts produced in last half of cycle.
35.79	Average watts produced over last half of cycle.
71.58	19.95 x 2 because the coil is de-energized two times per cycle. Once at start of cycle and again at mid-cycle.
143.16	39.90 x 2 for two coils.
	Output measured between coil and light.
	Set-up # 9. Mean all channels.
	DC Coupling everywhere.
	One 36 VDC 60 watt forklift light.

These test was done to determine if the power from the coil when de-energized was AC or DC. Well, It's both. The test done 04-26-15 20:04 was checking for AC only. which it found. All DC power was ignored. The test done 04-26-15 20:08 was checking for AC and DC which it found. It recorded more power. 71.58 - 48.20 = 23.16 watts more. The only thing different in these test were the time taken and one measured checking for AC and the other test checking for AC and DC.

I decided to do the piston only test again to determine if there was a mixed voltage there also. Below are photos of the oscilloscope and the spreadsheet data.





M	N	O	P	Q	R	S	T	U	V
	The GAP Motor-Generator				The GAP Motor-Generator				
	04-26-15 19:38				04-26-15 19:45				
	Output to lights from piston only at 640 rpm.				Output to lights from piston only at 640 rpm.				
18.47	Average watts output on left coil.			13.97	Average watts output on left coil.				
17.40	Average watts output on right coil.			12.63	Average watts output on right coil.				
35.87	Total average output watts per pistion action only.			**26.60**	Total average output watts per pistion action only.				
	Set-up number 9. Mean. DC Coupling.				**Set-up number 7. Cycle RMS. AC Coupling.**				
	One forklift light on each coil. Part number 4350.				One forklift light on each coil. Part number 4350.				
In this test, 04-26-15 19:38, both AC and DC is included.				In this test, 04-26-15 19:45, with AC Coupling, all DC is ignored.					
35.87 - 26.60 = **9.72 watts difference.** So, this tells me that the power produced by the piston action is also mixed. AC and DC.									
If using DC coupling to measure the input to The GAP Generator, the DC power produced here, like the DC power produced by the									
coil when de-energized, would be added to the input power to The GAP Generator from the batteries. Which would be overstated.									
Like the test Output from coil when de-energized 04-26-15, this test confirms to me that the input power to The GAP genertor should									
be measured using Cycle RMS with AC Coupling.									

The photo below is a typical test result of charging batteries.

The GAP Generator	
04-24-15 12:42	
Two Cylinder charging batteries left coil only	
Amplification and Neutralization. 619 rpm.	
164.83	Average watts to GAP Generator from batteries.
194.95	Average watts output.
118.27	**Percent of unity.**
30.12	**Average watts over unity. Left Coil only.**
60.24	**Average watts over unity for both coils.**
	Set-up # 10. Cycle rms input DC mean output
	DC COUPLING ON CH3 AND CH4 MENU
	One full bridge rectifier 276-1181 and blocking diode.

Summary:
If you've read this entire article then you're probably aware that I've had quite a time figuring all this out. There was so much I was unaware of concerning electricity.

Just some of what I didn't know:
1. AC and DC can be on the same circuit.
2. How to determine if it's AC or DC.
3. Is this device producing AC, DC, or both?
4. Where to measure the input to get the correct numbers.

Some time ago I was told, by a very high profile person in the electronic industry, that this was a very complex device. Maybe that's so but, it's getting easier to understand as time goes on.

There is mixed voltage in The GAP Generator. One has to be aware of this and know how to measure correctly. Until recently this has been a very elusive thing for me.

The end result is **power.** How much **power** does it take to operate this device and how much **power** does it produce. In electricity we measure **power** in units called watts. To find out the watts of power we multiply Volts times Amps. Volts x Amps = Watts of **power.**

After finding out about something called Extra Low Voltage AC and that the very first thing The GAP Generator does is convert the DC voltage from the batteries to AC voltage, making it a very simple inverter, things got a little easier for me.

From day one I've always believed that the input power should be measured between the relay and the coil. Most everyone, supposedly in the know, would tell me that I had to measure the input voltage and amps at the batteries. If I answered them at all it would go something like this: "The only thing that will tell me is the voltage in the batteries." If this device was operating on DC, I would tend to agree but, the only way I can measure the input in AC is to check it after the contacts of the relay, which is switching the DC to AC. Prior to that point the power is DC.

The answers to **just some of what I didn't know**, was lying right in front of me. My problem was, I didn't know enough about it to use it. The oscilloscope. The very high profile person in the electronic industry I talked of earlier in the article, he taught me over the phone how to use the oscilloscope. Even with his help it took quite some time for it all to sink in.

In my mind, I'm certain of my findings. For me to change my mind, someone would have to prove me absolutely wrong. To do that, they would have to spend lots of money, not just make statements.

The absolute proof is in completing the device to the point that it is charging it's own power source, the batteries. This will take very little in electronics.

I hope that my experiences have been, and will be, of help to others in their endeavors to finding ways of creating overunity devices.

Art Porter