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226 Comments **E-Cat World** 9+ **gdaigle**

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Mark • 6 months ago

Hal Puthoff is a part of Tom DeLonge's To The Stars Academy. They did talk about wanting to build a flying machine that will use a revolutionary energy source. I wonder if it has something to do with cold fusion...

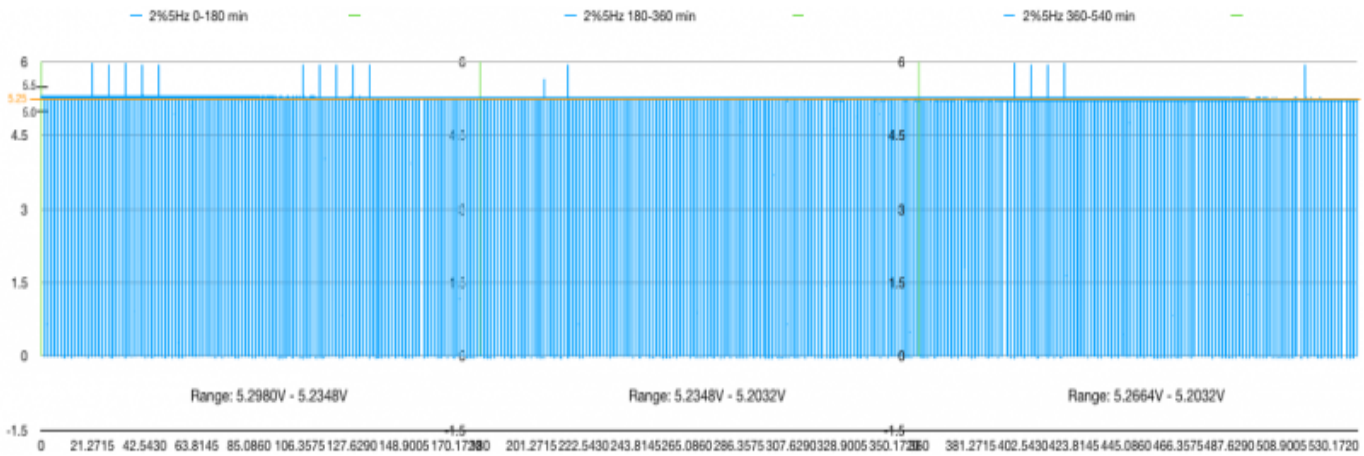
^ v • **Reply** • **Share** ›

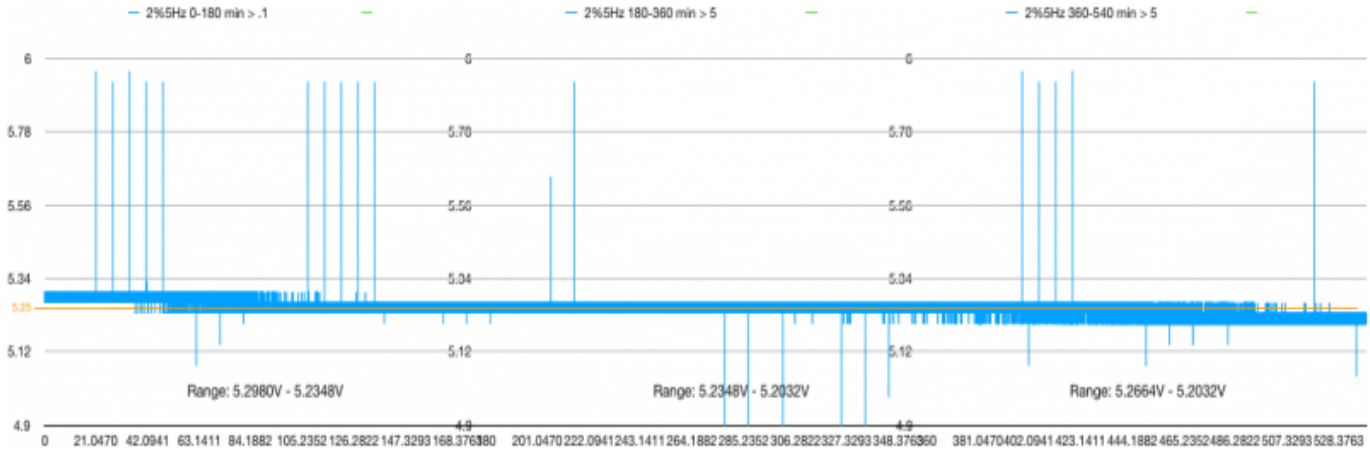
gdaigle • 2 years ago

After the 470 ohm run I acquired a number of resistors between 470 ohm and 91K ohm

I wasn't sure how to select a resistance over that scale, so I went logarithmic, selecting a resistor at 5.58K ohms because it was about the half way point between 470 and 91K.

The 9 hour run began with the cell reading at 5.3V after a 3 hour bias. As with the 470 ohm resistor, the results of the 9 hr run show the trace still trending down.





Despite beginning 0.3V higher at the start than the 470 ohm test, this run also moved down to about 5.2V and also showed some large spikes above and below. I'm not sure yet whether those large spikes are artifacts of the recording or not.

The results indicate that I should still go higher in resistance. It was pointed out that the 91K ohm run did dip down 8 hours into the run, but quickly recovered, so I still consider 91K as having reached stability, so my selection from the resistors will still be below 91K.

Having reached these interesting results, I'm going to open a new thread and repeat the postings from the run at 91K, plus a little background.

3 ▲ ▼ • Reply • Share ›

Marcus W ➚ **gdaigle** • 2 years ago

did you open a new thread ?

▲ ▼ • Reply • Share ›

gdaigle ➚ **Marcus W** • 2 years ago

Not yet. Taking some time off before I begin the new thread.

1 ▲ ▼ • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Keep at it, Greg. You da man!

Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

Taking on a consulting gig so the new thread will likely be delayed some more. Stay tuned.

1 Reply • Share ›

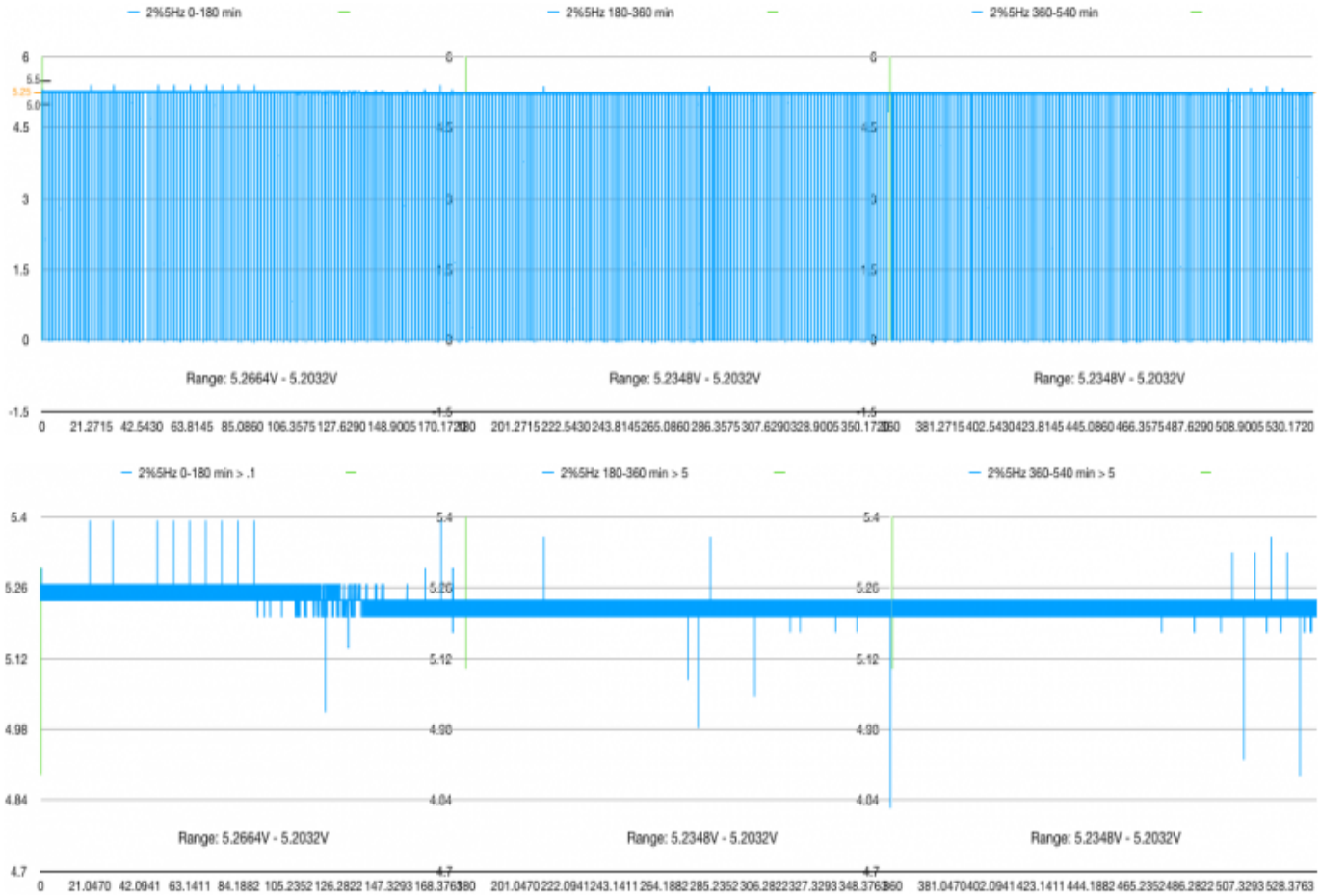
Marcus W ➚ **gdaigle** • 2 years ago

succes, but keep us informed, ok?

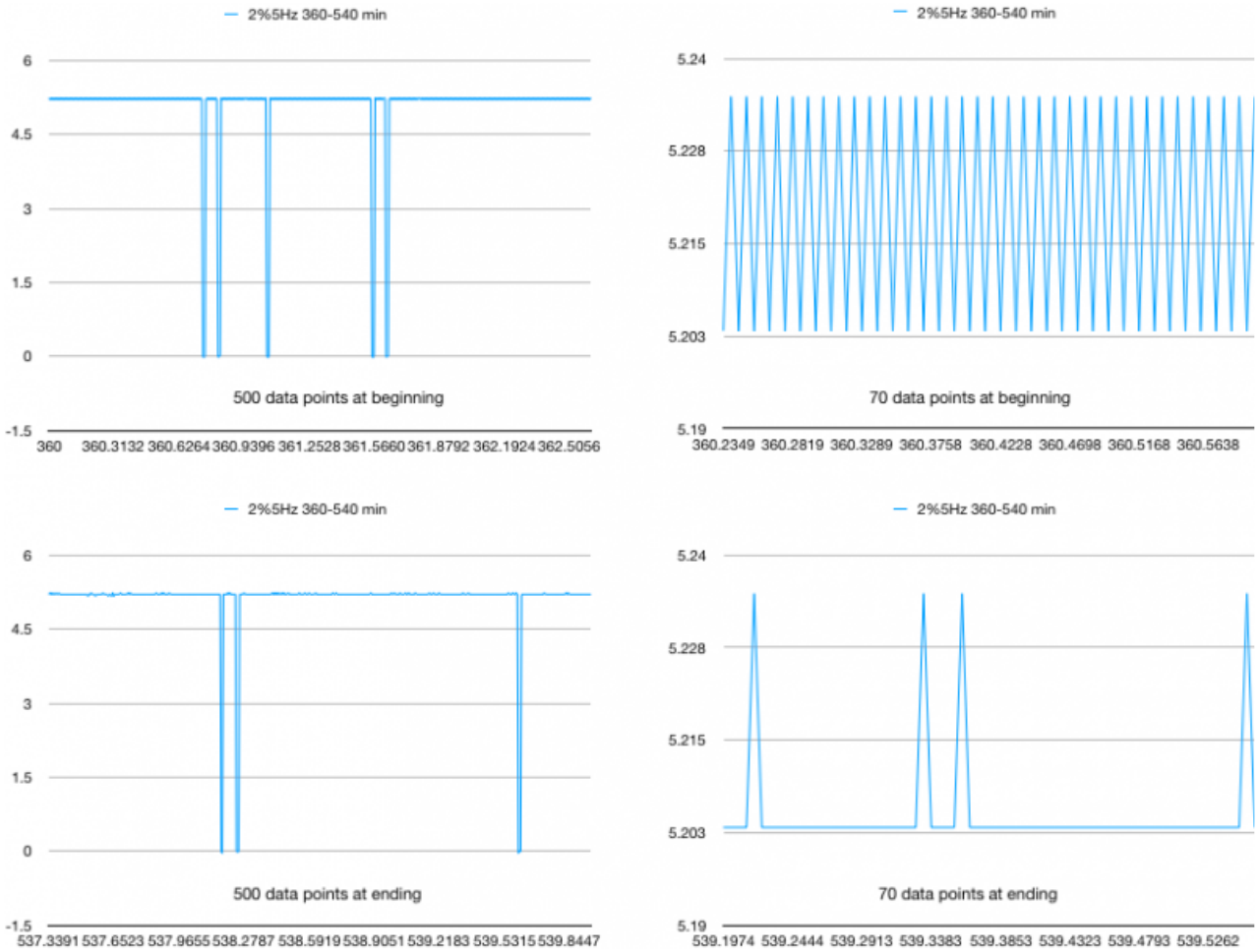
Reply • Share ›

gdaigle • 2 years ago

I've upped the resistance from 91.6 ohm only 5-fold to 470 ohm. Otherwise, the settings are the same. What I see is an improved trace, but it still does drop, particularly after the first 2 hours of this composite of another 9 hour run. As before, the entire trace, then the trace with recording anomalies removed:



Although it looks like the trace is pretty stable at the end of the run, a look at a closeup of the first 500/70 data points and the last 500/70 data points shows that the trend of the trace is still going down:



So this indicates that moving to a higher ohm values still well under 1K ohm moves us closer to stability (other variables being held steady), but it is not being reached. The next step up in my resistor kit is 15K ohm, so I need to get some other resistors between 500 ohm and 15K ohm. Will be back at it later today.

3 ^ v • Reply • Share ›

gdaigle • 2 years ago

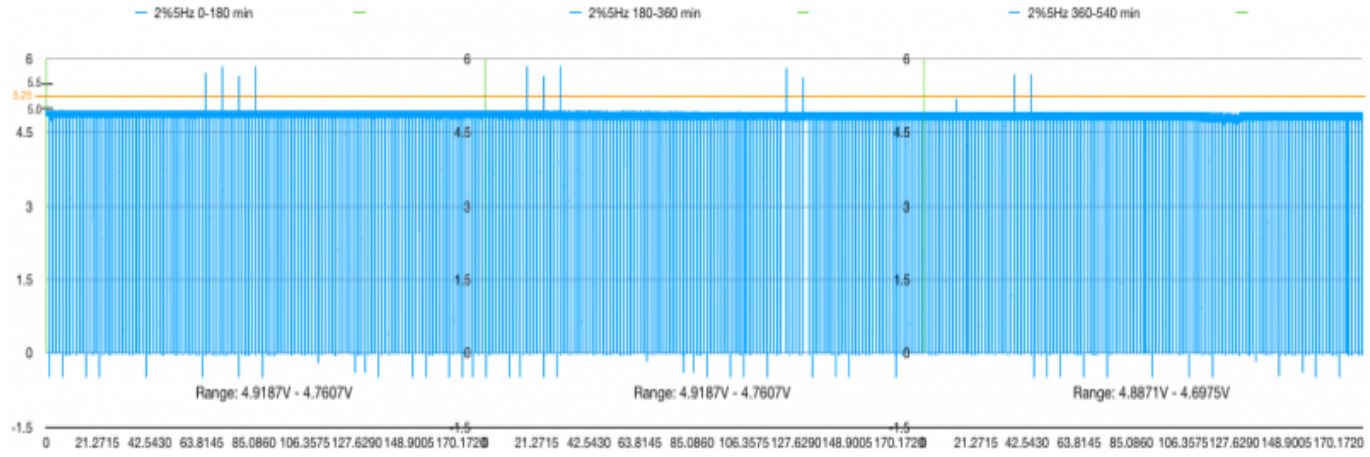
In talking with a former member of the group SKDB (Steorn Knowledge DataBase) where I was under a non-disclosure for some years, a thought came up that was previously not considered.

Assuming that the duty cycle and recovery time are not completely out of whack, another possibility might be that the low ohm resistor (91.6 ohm) being used as the drain during the duty cycle might be causing too great of a drain, impacting domain alignment adversely. How exactly, I'm not sure but thought it worth a try. Remember that this cell is not a capacitor and does not act like a capacitor (around 5.25V anyway).

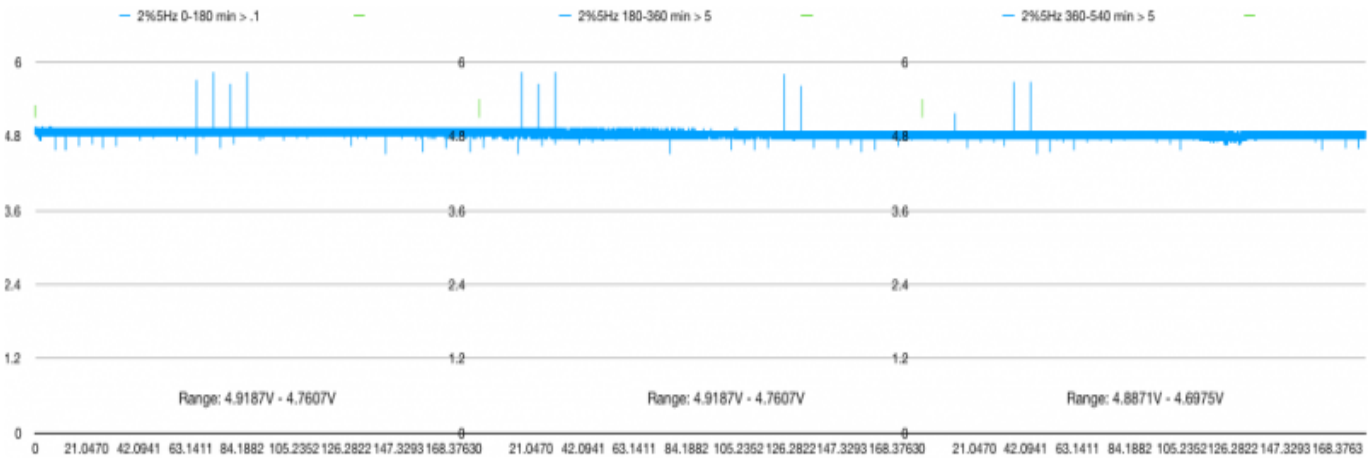
The solution would simply be to increase the ohms of the resistor. But by how much?

I decided to set a distant value by using a 91K ohm resistor, 1000x the ohms of the current resistor. Let's see what happens.

The BC1 cell was biased back to 5.26V. Here is the scope using the same 2%5Hz settings as before but a 91K ohm resistor as the drain for a 9 hour run:

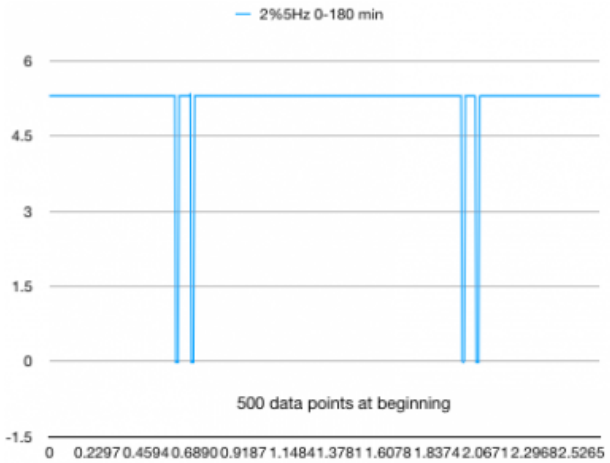


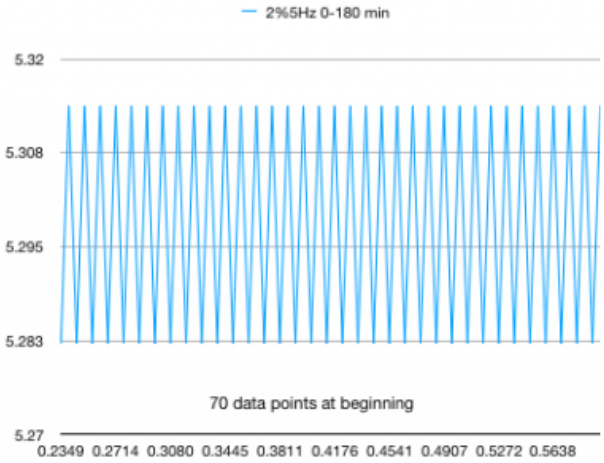
And here is the same with the recording anomalies removed:

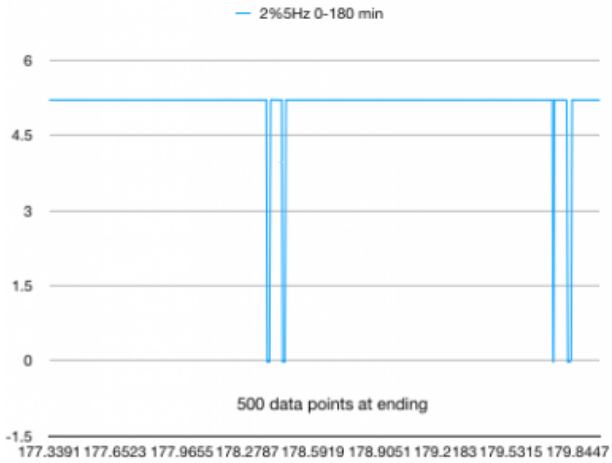


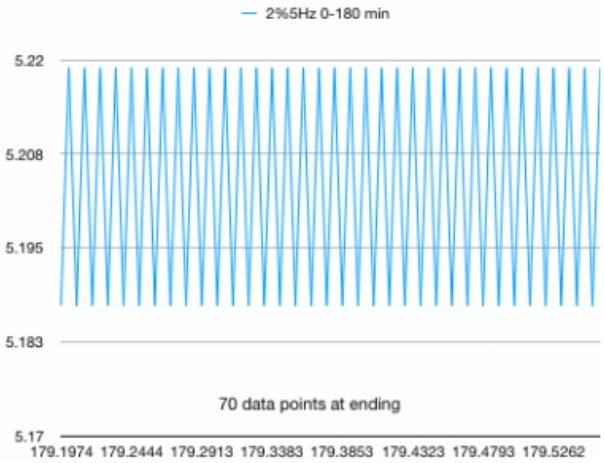
The first thing I noticed is that it is remarkably flat. The second is that the reading of the cell during the trace did not go above 4.8871V except for a few stray spikes, yet the multimeter before the test had read 5.28V. After the run I checked the voltage of the cell again and the scope read 5.27V. I suspect that the high resistance is lowering the voltage reading of the scope.

The traces are not just oscillating between the resolution of the scope at those setting. Here is a sample of the first 3 hours when the draining resistor was 91.6 ohm:

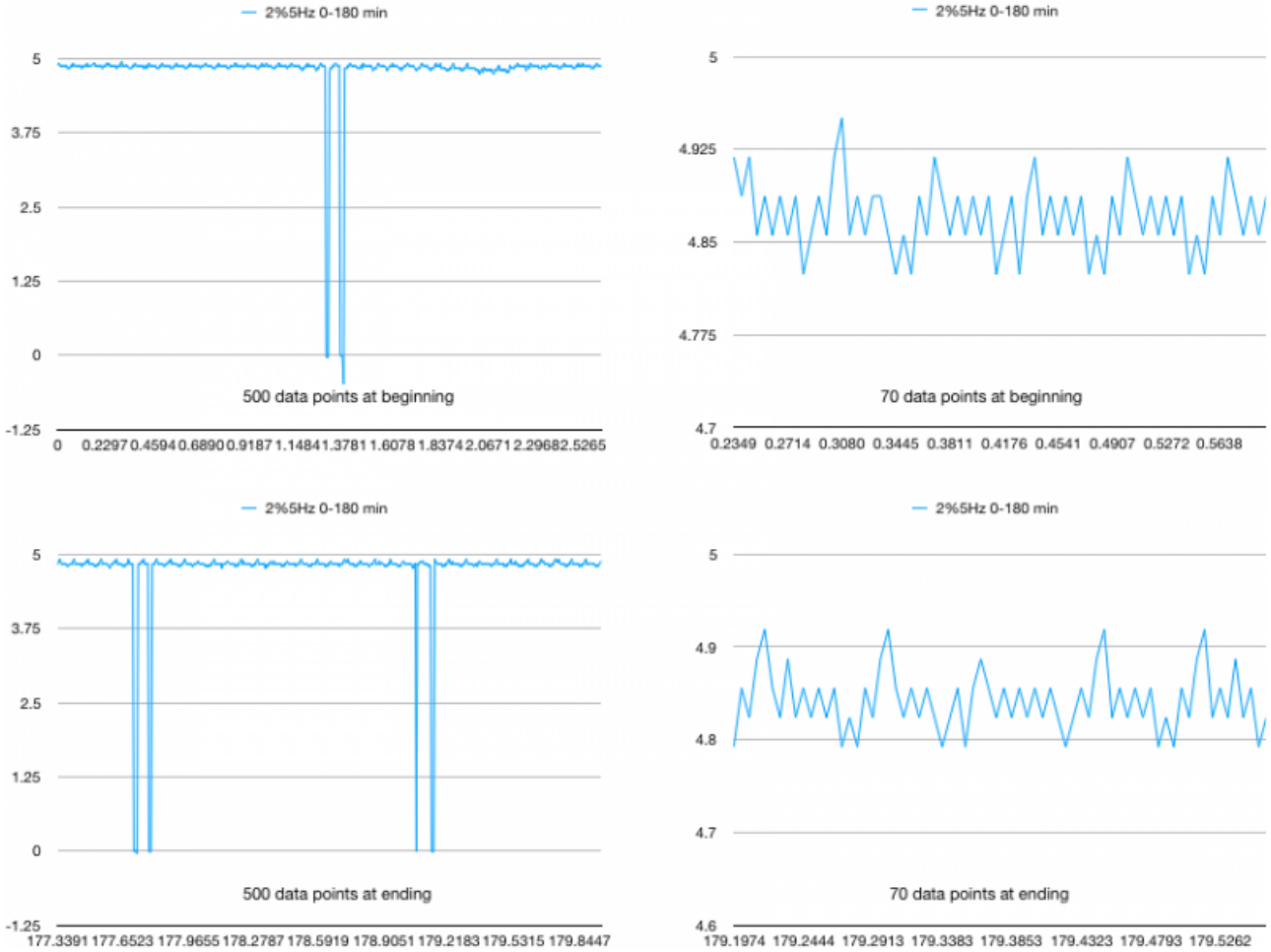








And here is the sample of the first 3 hours when the draining resistor was 91K ohm:

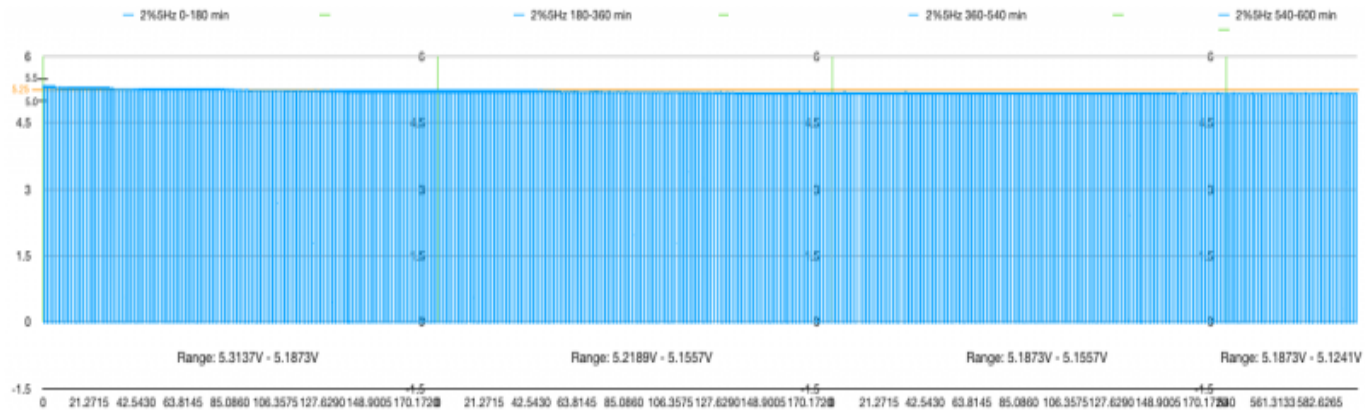


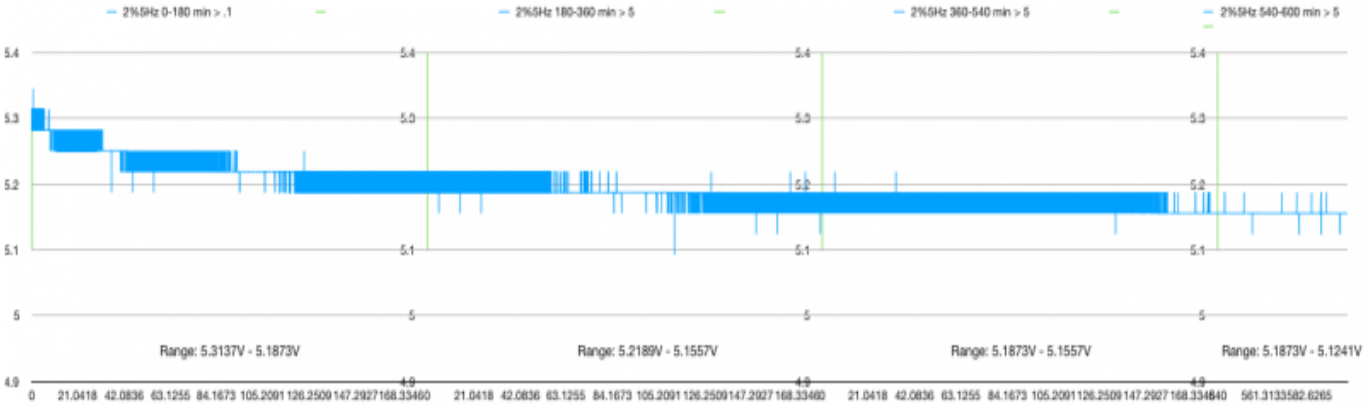
I will see what happens if I continue to adjust the resistance between 100 ohm and 90K ohm.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

Here are the results of a 10 hour run at 2%5Hz. The BC1 cell was biased for over 10 hours this time and reached a full reading of 5.3V on my meter. First, the full scope trace, then after it the trace with recording artifacts removed:





As before, the voltage drops in the first 1-2 hours and continues to drop down to lows of 5.155V over 9 hours. I extended the run for an hour past the normal 9 hours and in that last hour I get a fairly stable trace around 5.155V.

The previous run began at 5.203V because the cell had not fully been biased, so it took this run about 3 hours to come down to that beginning voltage of the last run. Next time I'll drain the cell down to about 5.2V before beginning the run to get a more even comparison.

Recall that the duty cycle of this run is twice as long as the previous run, but the recovery is also twice as long, so I would have expected the cell to reach any stability point twice as fast as before. And if we squeeze the previous trace run's width to half it does seem similar to this run's trace around the middle of the third segment (6-9hrs).

It is clear that no stable point above 5.2V is being reached by either run, so unless we assuming a stable point even below 5.15V (and I'm not sure why we should) then it's clear that the cell is not going to self-sustain at these settings.

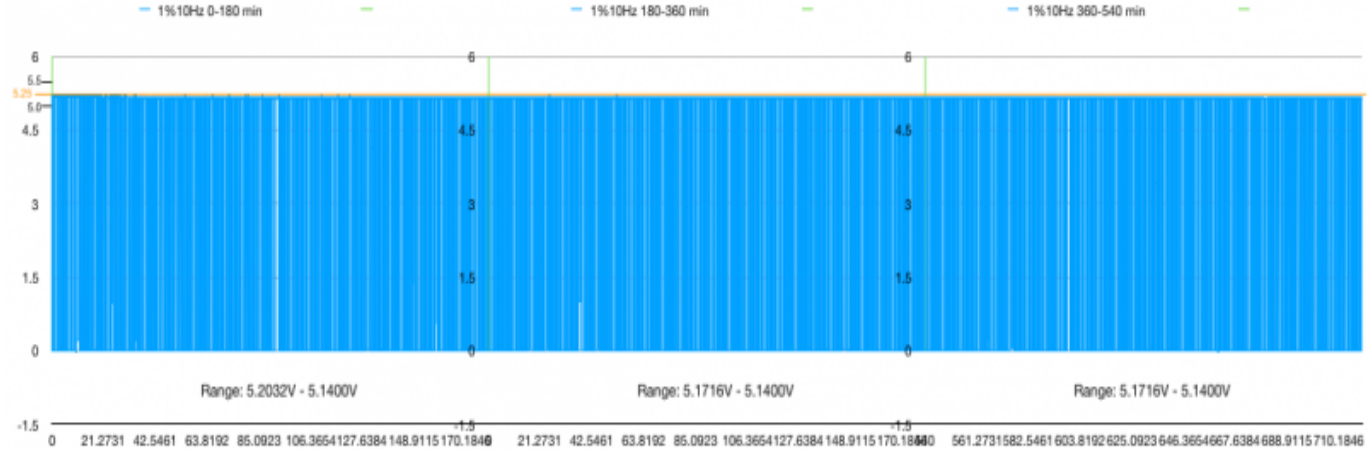
1 ^ | v • Reply • Share ›

gdaigle • 2 years ago

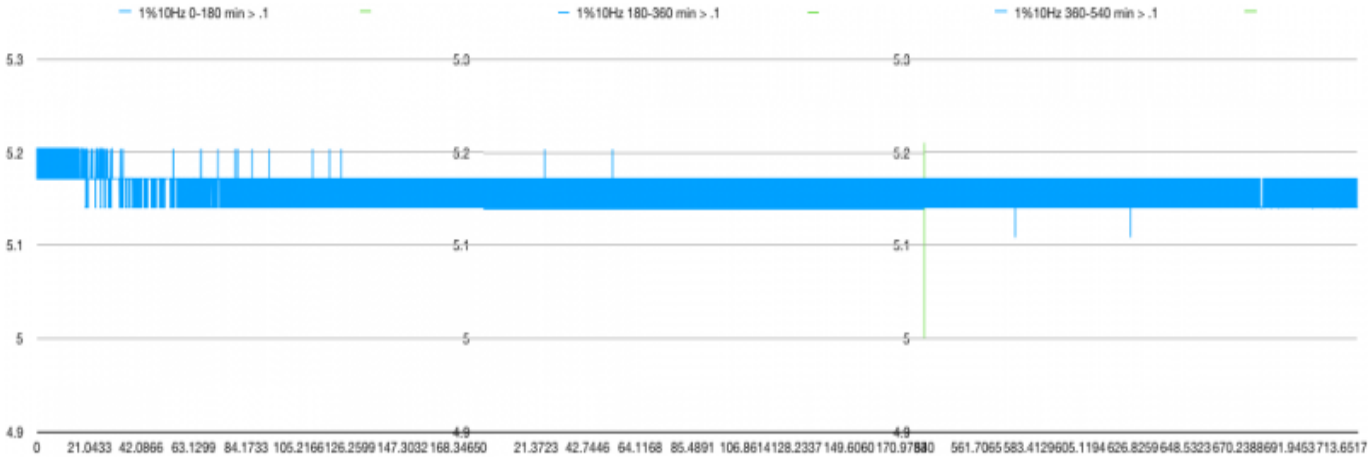
Again, more interesting results. I'm doing a deeper analysis this time.

After biasing BC1 for 5 hours I did a 9 hour run of 1%10Hz (0.001 second discharge and 0.1 seconds for the cycle). After the first hour the voltage appears to become more stable, but this might just be showing a very slow discharge.

Remember that over 10 seconds, 1%10Hz represents 100 discharges of 0.001 seconds and 100 recoveries of .099 seconds, or in total, 0.1 seconds of discharge and 9.90 seconds of recovery. Here is the trace:

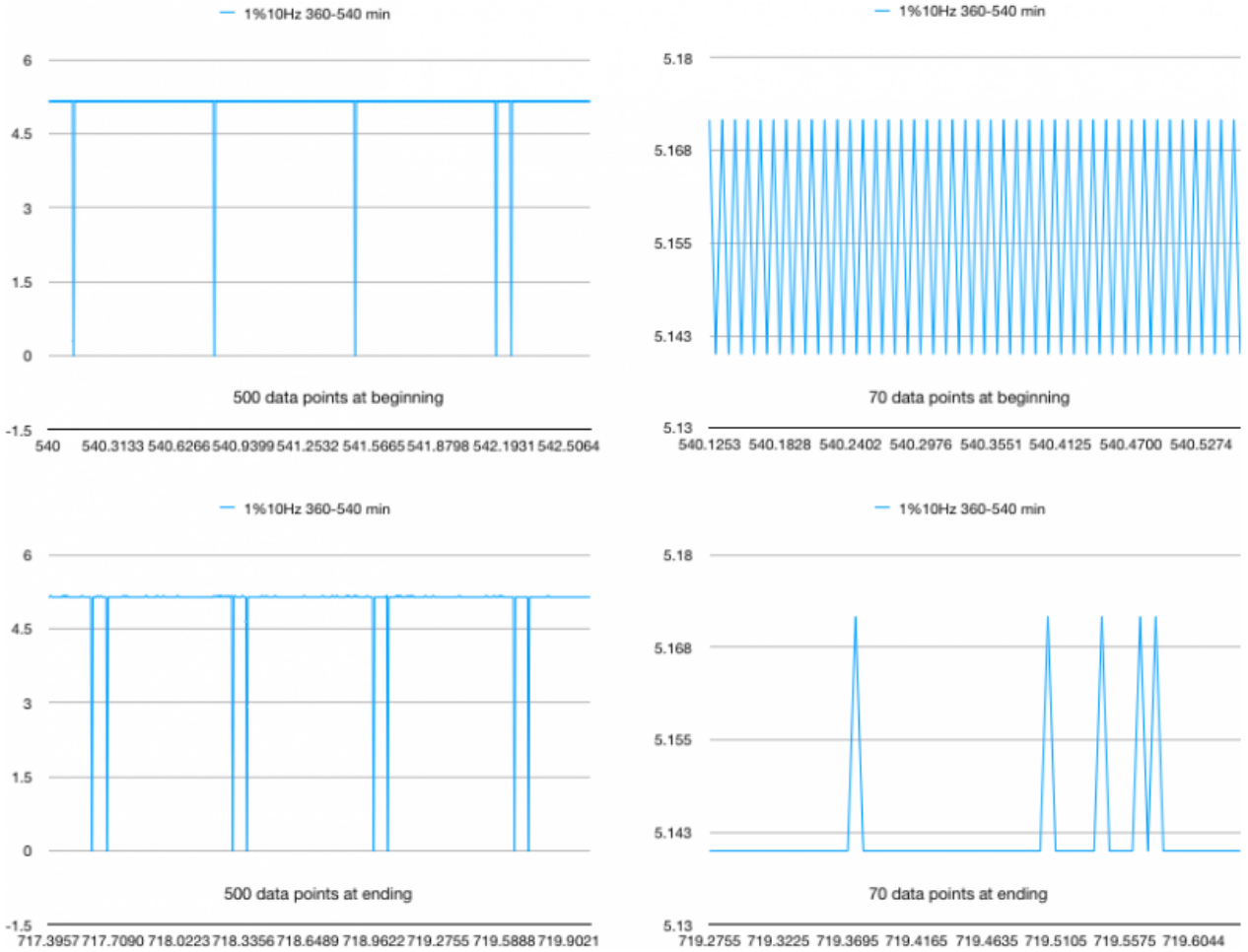


I've eliminated the drops down to about 0V (due to interactions with the recording periods I've set) so that you can see the actual changes in voltage more clearly:



The voltage for the last hour of the first 3 hours (0 - 180 min) was very stable, trading off between 5.1716V and 5.1400V very evenly. At these settings the resolution of my scope is 0.0316V so the true voltage falls somewhere in between.

The same held for the next full three hour segment (180 - 360 min). The third segment (360 - 540 min) began the same, but even though the range did not change (with the exception of two data points below 5.1400V) by the last hour (480 - 540 min) the proportion of readings at 5.1716V vs 5.1400V is now favoring 5.1400V). Here is a chart of the first and last 500 data points for 360 - 540 min, and the first and last 70 data points for the same (which does not include drops down to 0V, so the scale is more accurate):



You can see that the trace is trending down. So now the question is whether this represents the cell trying to find stability between 5.1716V and 5.1400V and not quite achieving it, or whether this represents a very slow discharging of the cell.

To better discern this I will change the settings to 2%5Hz, which doubles the cycle time from 0.1 sec. to 0.2 sec., giving the domains nearly 0.1 more seconds to recover, but increases the discharge only from 0.001 sec to 0.002 sec.

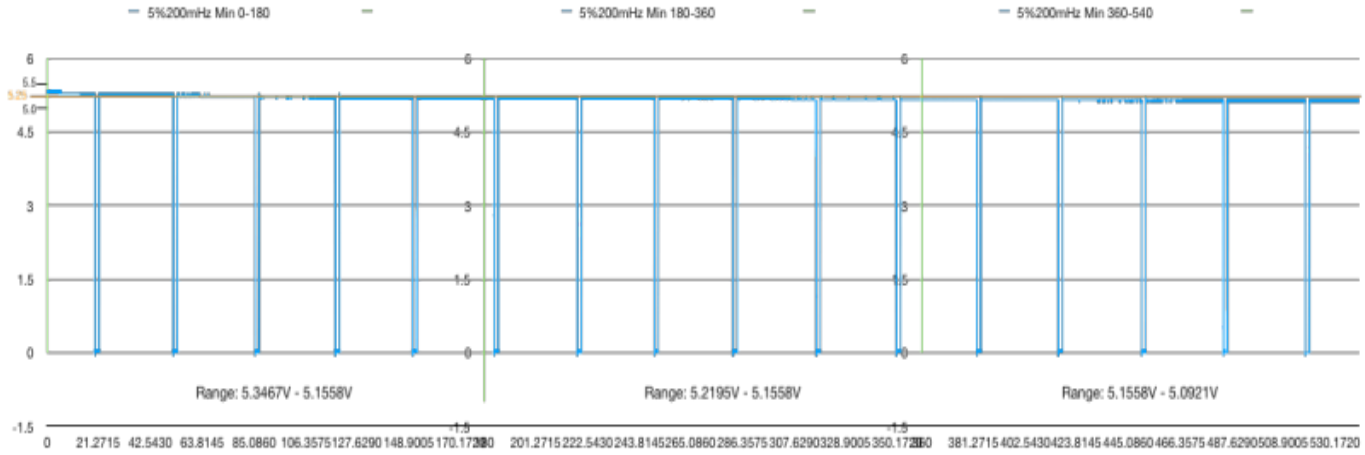
1 ^ v • Reply • Share ›

gdaigle • 2 years ago

After biasing the BC1 cell for 13 hours I began another 9 hour run. My thinking was that the most recent runs with BC3 showed that 200mHz might present a sufficient cycle time (5 seconds) at a 2% duty cycle (discharging 0.1 seconds and a recovery time of 4.9 seconds), so it was time to step up to a 5% duty cycle (0.25 seconds and recovery time of 4.75 seconds).

However, there was also the chance that since my BC3 cell was not charging properly that this might just have been anomalous behavior.

So I did upp the settings to 5%200mHz, but the result of this run shows that the voltage is still dropping:



Going back to earlier tests from almost 3 weeks ago, I noted that during a 5 minute test at 1%10Hz (0.001 second discharge and 0.1 seconds of recovery) there was a brief period where the trace seemed to recover for a short period of time — statistically going between the min and max of the resolution of my scope for those settings, slightly covering toward the max, then again going between the two values evenly. Since the voltages at the time were above 5.7V and now I think that voltages much higher above 5.25V may not allow the cells to behavior in their “special” way (i.e. allowing domains to realign in a not-like-a-capacitor way) I did not give it much credence.

But now I think it would be worth going back to those settings after biasing to just above 5.25V and see how a run at those settings goes.

If the results are no better than recent tests then I’m going back to extending the recovery time beyond the test just done, keeping the duty cycle at 5% and increase the recovery time by changing the frequency to 100mHz. That should produce a discharge of 0.5 sec for every 9.5 second recovery time. However, I'm getting to the point where such a long period of recovery would likely not be feasible if you're going to recharge a couple of cell phones each day with 8 cells.

1 ^ | v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

I hope that you'll keep going, even if it is not powerful enough to charge a phone. I like reading your updates, even if I don't entirely understand them. This is still exciting stuff!

1 ^ | v • Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

I can stay "on it" for at least a few more weeks. You never know when there'll be a legitimate breakthrough.

1 ^ | v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Just out of curiosity, what is going to happen after that few weeks? Is someone else going to take over?

^ | v • Reply • Share ›

gdaigle • 2 years ago

Just an update that I'm currently recharging BC1 to 5.29V through my voltage divider circuit.

1 ^ v • Reply • Share ›

gdaigle ➚ gdaigle • 2 years ago

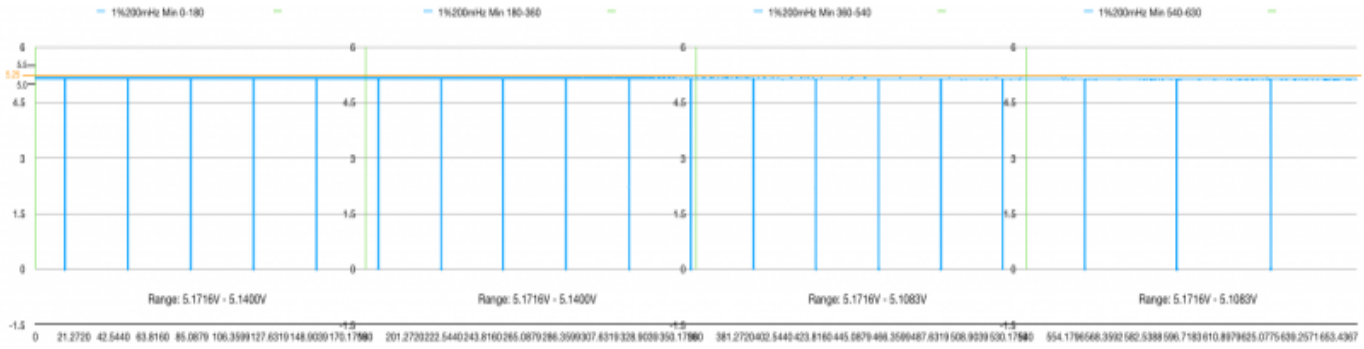
A bit of waffling here. BC1 began at 0.18V and I recharged it using the 5.29V output of the divider. It reached 4.10V within a few minutes but after 4 hours only reached 4.82V. So I swapped out the resistors so that the voltage divider output 5.41V instead of 5.29V. But after a total of 9.25 hours it only reached 5.09V. I did a 6 hour run at 5%200mHz, but voltage dropped below 4.9V.

So I'm back to soaking the cell at 5.29V for the rest of the day to properly bias it. Will begin another run end of day.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

And here is the latest trace for cell BC3. The run started 6 hours after the last run, with the duty cycle of the cell still running through the Crydom and discharging the cell. The length of this run was 11 hours. so with the first part of the run this represents a 26 hour timeframe for the test. Lowest voltage is now 5.1083V so it does not appear to be recovering fully, though the rate of decline is very slow. Here is the trace:



From here I think I'll prep another cell (I'm assuming BC3 may have been damaged) by biasing it for some hours to just over 5.25V rather than 6.07V, then testing again close to the optimal voltage. Stay tuned!

2 ^ v • Reply • Share ›

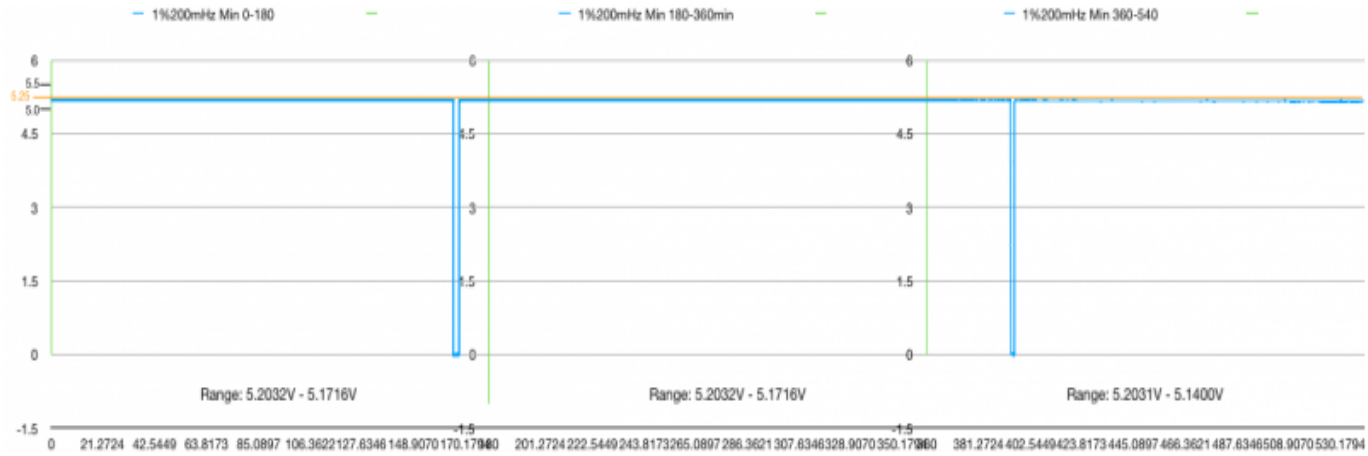
gdaigle • 2 years ago

I'm afraid that I need to report that the bump found at the end of the previous 18 hour run was an error. When I changed the timebase from 200ms to 20ms for the scope the number of data captures for each 9 hour period changes (e.g. 108K captures vs 104K captures). Since my laptop is taxed when doing these data manipulations with 35K+ datapoints, to save time I've taken to importing new data into old spreadsheets and did not notice that the timebase for the first 9hr capture was different for the second 9hr capture. So the bump up was actually data from a previous run (higher because the voltage had dropped slightly over the two runs). Hence there was no "bump up" indicating recovery. Sad, but I'm glad that I found it.

For today's 9hr run I did bias the cell again with a 6.07VDC source for 6 hours. However, I found that the cell only recharged to about 5.85V, which is below what it used to be charged to after only a few

minutes charging. This may indicate that this cell (BC3) has been damaged by repeated charging at higher voltages than the optimal voltage. Regardless, I depleted the charge for some minutes using the 96.1ohm resistor until the cell was within the range just below 5.25V (5.2V) and began the duty cycle tests there.

Here are the results of today's 9hr run:



I have not stopped the duty cycle to the cell after this run but have run it unrecorded for 6 hours. I will continue the duty cycle run and capture another 9hr run tonight to give the equivalent of a 24 hour run. However, BC3 may have given its last for these tests as the voltage appears to continue to drop (albeit slowly). Tomorrow I will find a way to bias another cell closer to 5.25V to avoid any possibility of damage and begin tests again with settings similar to today.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

Was doing a 15 hour test to see if the recovery would continue. Unfortunately 15 minutes before the end of the run a glitch in my OS rebooted my machine and I lost the entire trace. Oh well, life in the fast lane. Will start again tomorrow after biasing the cell.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

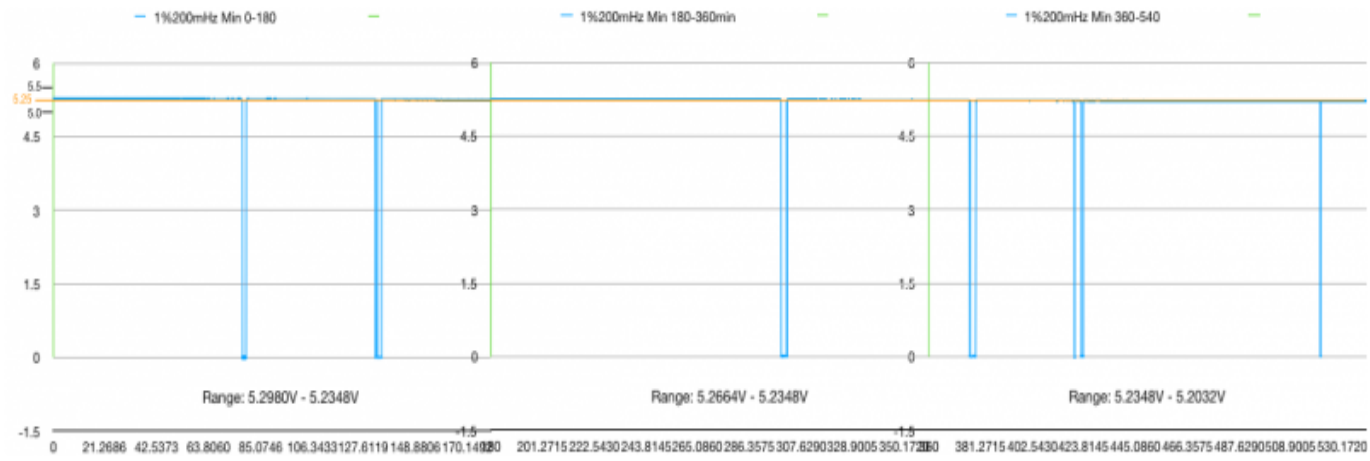
A bit of a hint of recovery and stability of the cell this time. Here is how it started.

The next 9 hour run used a 1% duty cycle and 200mHz (5 seconds between pulses) after biasing the cell to 6.07V for 2.5 hours. Since the prior runs began well above 5.25V and did not go below that voltage for almost a full 3 hours, I decided to reduce that period of time above 5.25V by discharging the cell with a 96.1 ohm resistor and begin the trace at 5.27V.

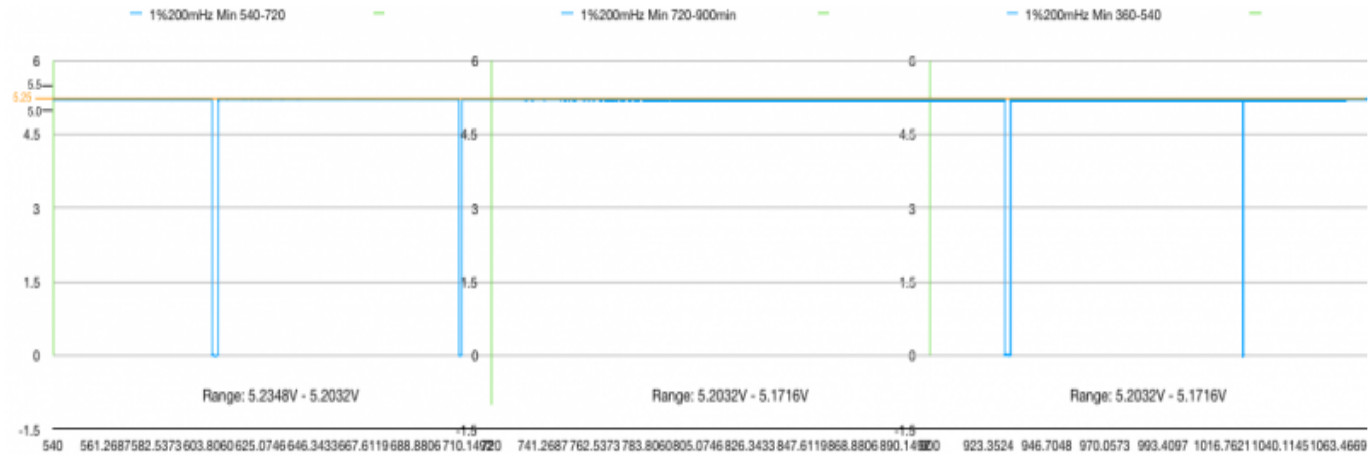
In the past Steorn has said that the 5.25V was optimal so I wanted to be sure that most of the run was below that voltage. Also, anything above the cell's optimal 5.25V may act differently than intended by Steorn (e.g. the recovery of the domains may not be the dominant effect of the cell).

Here is the trace. The resolution of the readings should be smaller since I reduced the divisions to 1V intervals and 20mS. I began the scope reading and saw that though the multimeter read 5.27V it read as a high of 5.2980V on the scope (actually, it was somewhere between 5.2980V and 5.2664V as my resolution with the new settings was now 0.0316V)

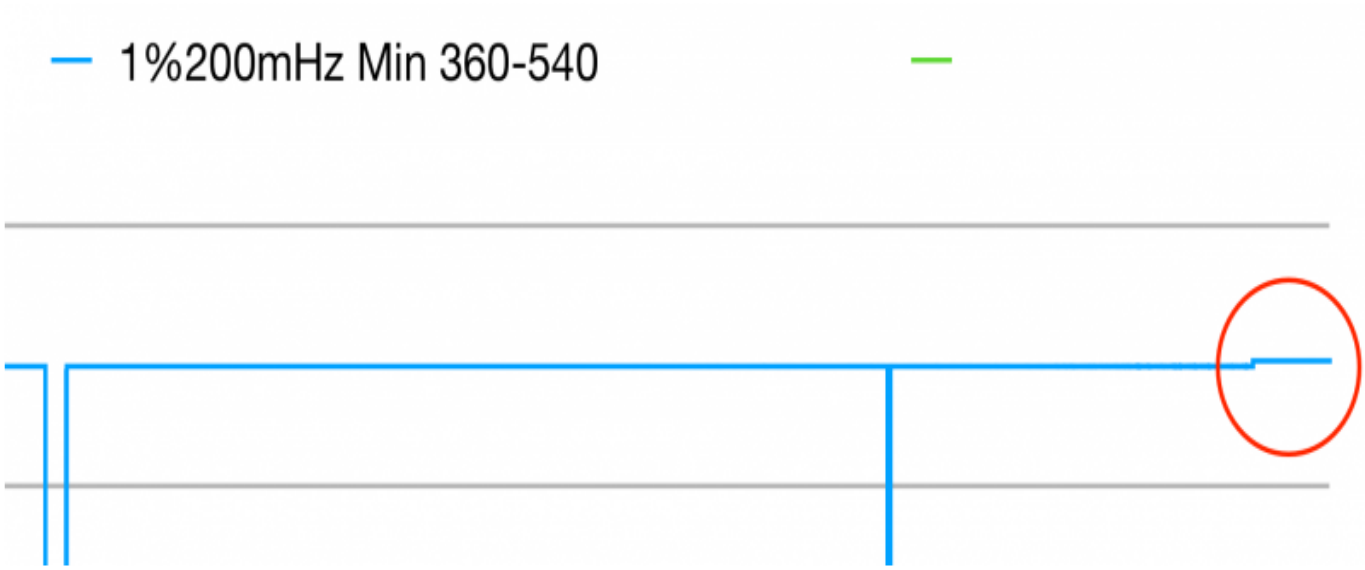
Again, 3 separate graphed records composited together with 5.25V indicated by the orange line:



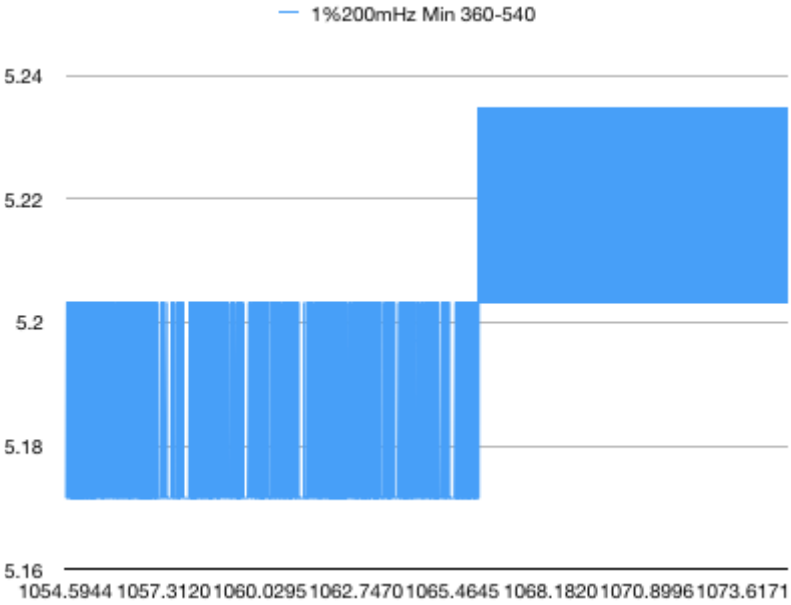
Recovery was still not found so I decided to run it another 9 hours in case this particular cell (BC3) had a stability point lower than 5.25V. That would make a continuous trace of 18 hours, so here is the second 9 hour trace:



It also did not appear to reach a stable point until you look at the very end of the trace. There in the last 20 minutes of the trace there is a clear recovery:



Looking closely at just that 20 minutes segment it is clear that this cell is regaining voltage, meaning that the domains have reached a point of realignment and stability between 5.2032V - 5.2348V:



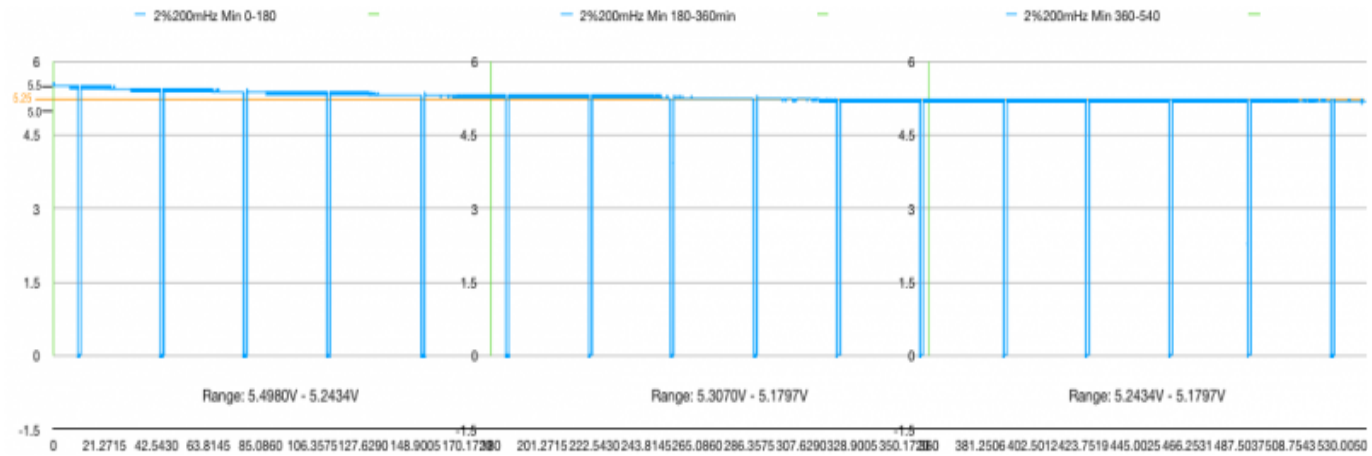
I am running the cell an additional 3 hours to see if that recovery is maintained. After that perhaps taking measurements around that stable point reducing the recovery period and/or increasing the duty cycle until that stable point is affected.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

This 9 hour run used a 2% duty cycle after biasing the cell to 6.07V for 8 hours. A stable point for the cell has still not been reached after 9 hours but compared to the 2%500mHz run 2 days ago the lowest voltage (5.1797V) is reached faster and maintains that voltage for over 3 hours.

Here is the trace. Again, 3 separate graphed records composited together with a starting voltage of 5.4980V and 5.25V indicated by orange line:



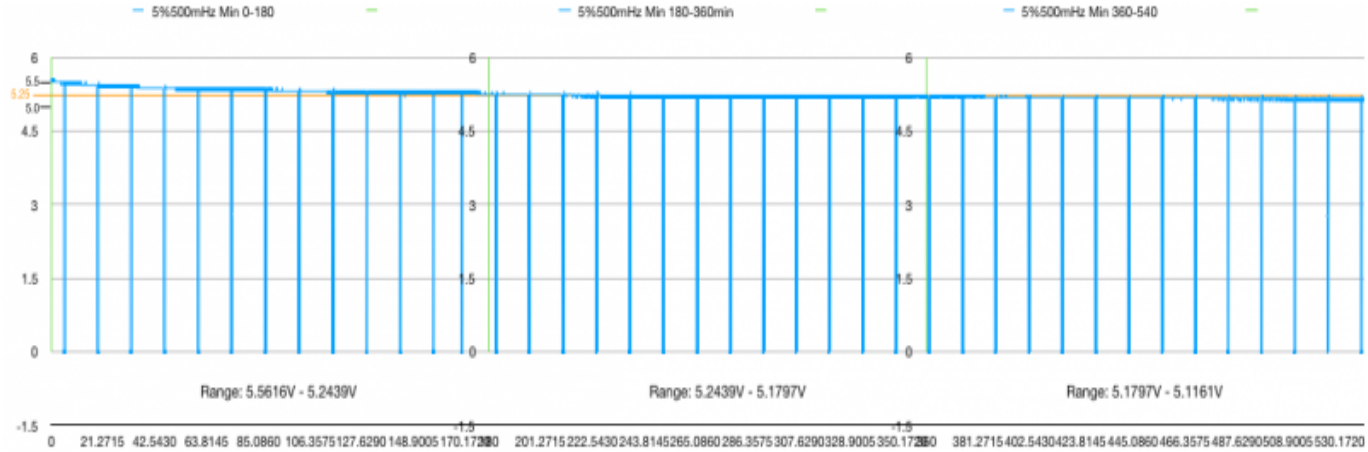
2 ^ v • Reply • Share ›

gdaigle • 2 years ago

Here is the next 9 hour run using a 5% duty cycle after biasing the cell to 6.07V for 2 hours. The stability point is still not being reached after 9 hours, so perhaps the 500 mHz frequency which

provides for a 1.9 second (95% x 2 seconds) recovery period does need to be lengthened to more than 2 seconds.

Here is the trace (3 separate graphed records composited together) with a starting voltage of 5.1616V and the ideal bias voltage of 5.25V being indicated by an orange line:



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Mark ➚ **gdaigle** · 2 years ago

I'm glad to see that you're keeping at it. I wish that there was some way that we could replicate this...

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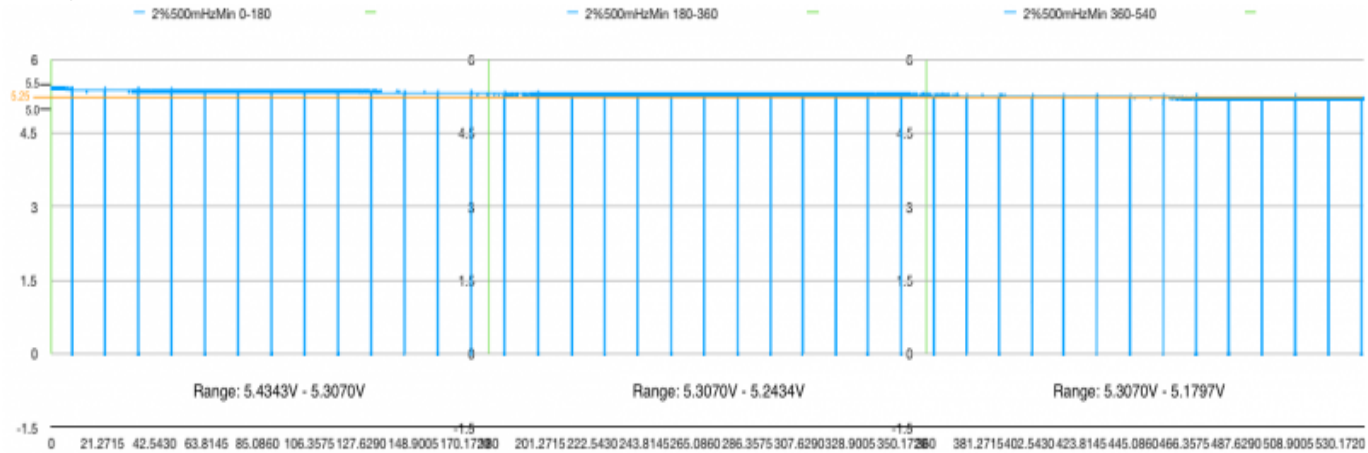
gdaigle · 2 years ago

Beginning some 9 hour runs using settings similar to that last run 11 days ago. In that run 1% duty cycle with a 500mHz/sec (2 second recovery for the domains to realign), it seemed to stabilize quickly with a beginning voltage of 5.4343V.

I started this 9hr run at the same voltage (5.4343V) and set it for a 2% duty cycle with a 500mHz/sec frequency. The trace did not stabilize at 5.25V but did go below it and appears to continue to drop slightly. It should be noted that the periods of stability (where the trace is a single voltage (thinnest line) are increasing from roughly 25 minutes, to 45 minutes to 85 minutes.

Here is the 9 hour trace (3 separate graphed records composited together) with 5.25V indicated by an orange line:



I will see if I can recharge the cell and discharge it again to about 5.43V before starting the next cycle. At this point I think that going back to a shorter duty cycle without changing the frequency would only give me a similar curve that takes longer to achieve a similar result.

I don't really want to get into anything longer than 9 hr tests so instead I'll lengthen the duty cycle and keep the frequency the same. That should reach any stability point more quickly and unless the critical recovery time for domains is greater than 1-2 seconds I should be able to find stability more quickly.

3 ▲ ▼ • Reply • Share ›

gdaigle ➚ **gdaigle** • 2 years ago

Just a slight correction. The above 9 hr trace at 2% 500mHz was actually 4% 500mHz. The format of the .csv file read into the scope was incorrect.

▲ ▼ • Reply • Share ›

Marcus W • 2 years ago

i dont have a thought on this, but i just like to know when approx. you're are going to be back with the testing? I like to read your posts, so i have to wait a week , sort of?

▲ ▼ • Reply • Share ›

gdaigle ➚ **Marcus W** • 2 years ago

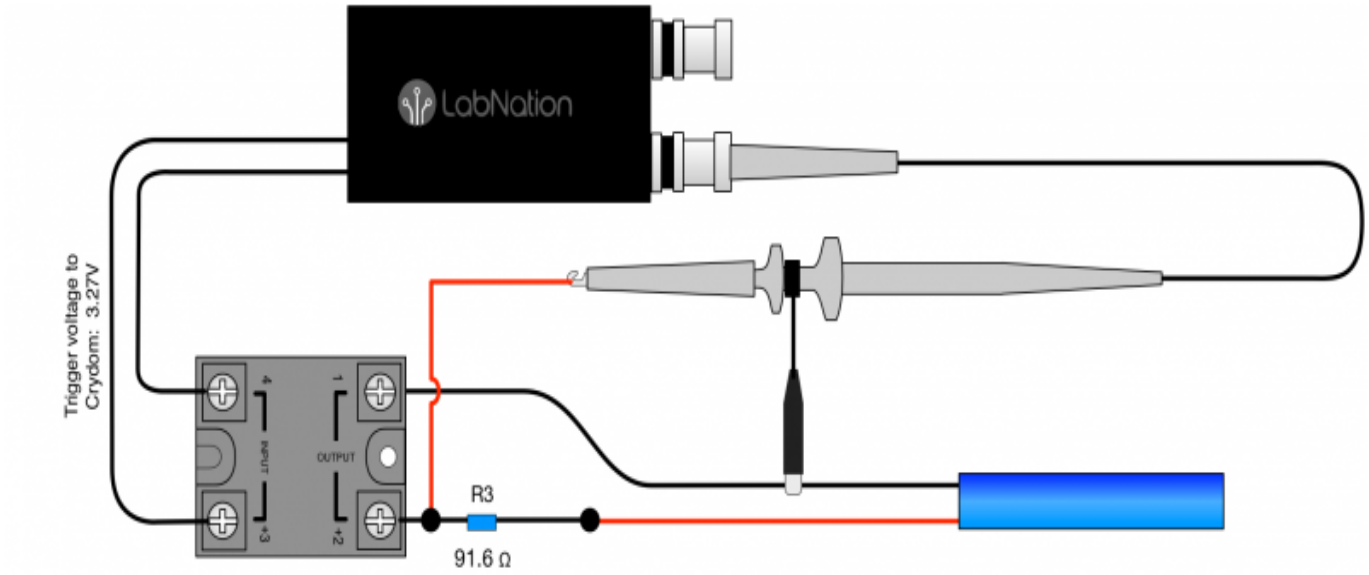
I'll be back at it August 25.

▲ ▼ • Reply • Share ›

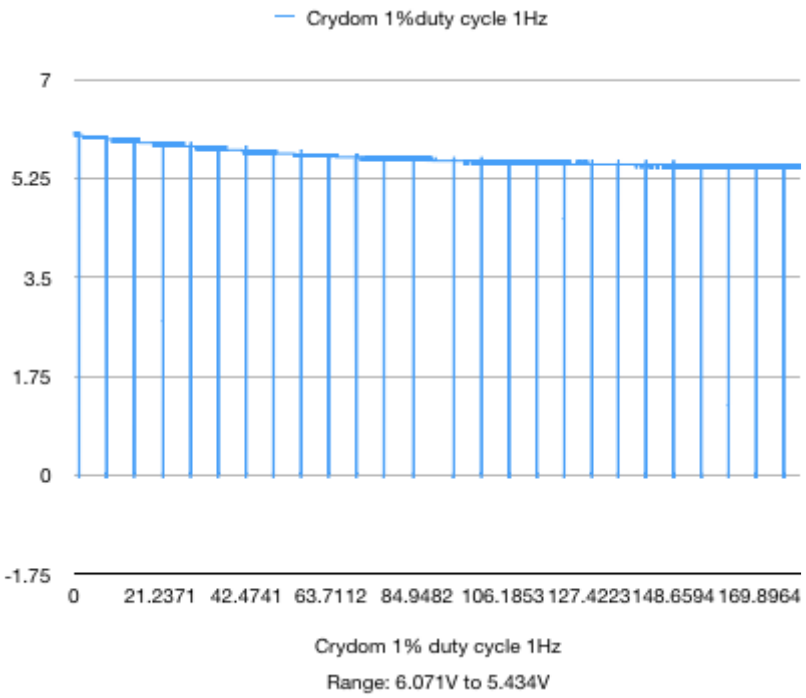
gdaigle • 2 years ago

This will have to be the last set of traces for the next week or so, but I think the results were pretty encouraging.

I used the newly discovered ability to upload a .csv file to change the duty cycle and frequency of the scope to run three trials. I used the same probe settings as the previous post:

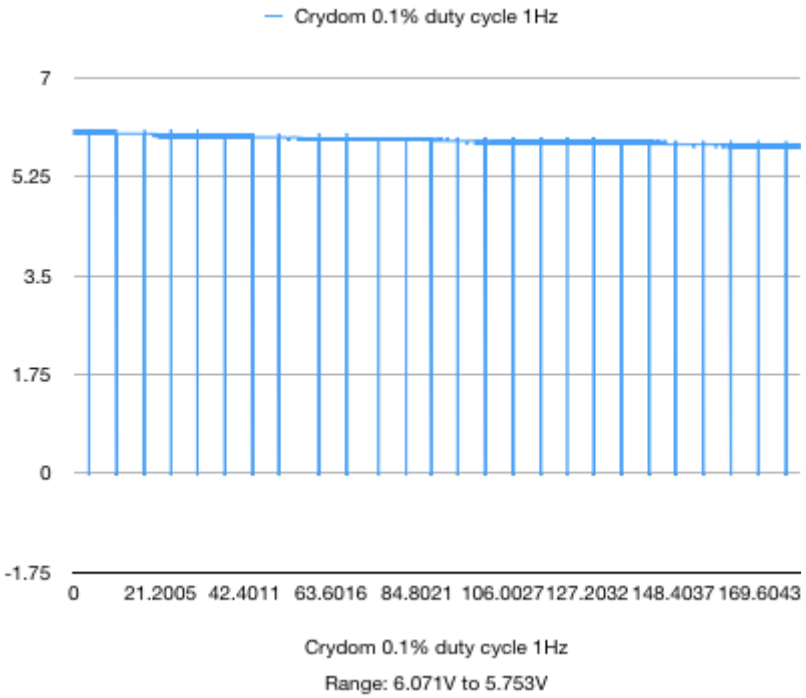


Trial 1: 1% duty cycle, 1Hz
I recharged the BC3 cell to 6.07V overnight to bias it. I then attached it to the Crydom and discharged it for 3 hours. Here are the results:



Crydom 1% duty cycle 1Hz
Range: 6.071V to 5.434V

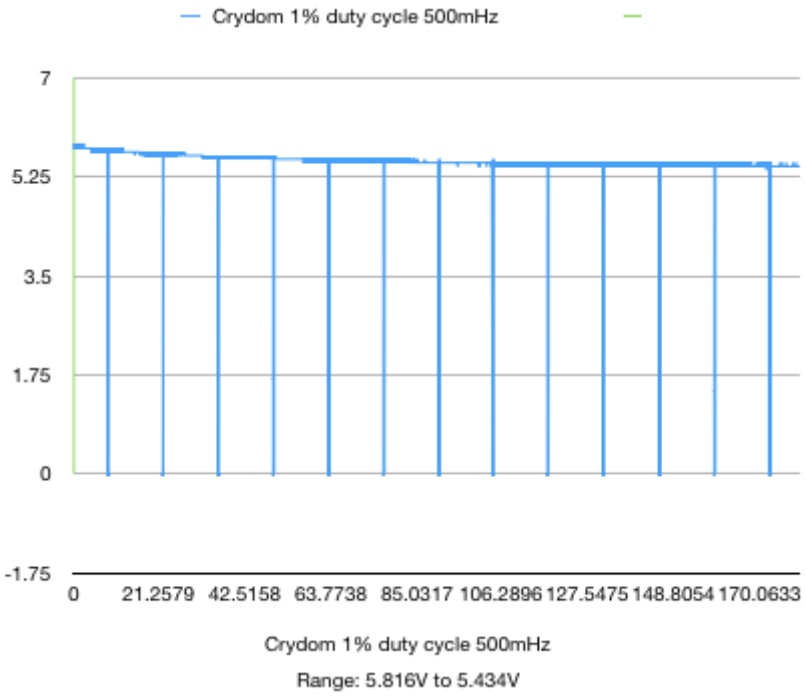
Trial 2: 0.1% duty cycle, 1Hz
I recharged the BC3 cell to 6.07V for two hours to bias it. I then attached it to the Crydom and discharged it for 3 hours. Here are the results:



Crydom 0.1% duty cycle 1Hz
Range: 6.071V to 5.753V

Trial 3: 1% duty cycle, 500mHz
I did not recharge BC3 cell but instead immediately started the run within a minute after the last test and discharged it for 3 hours. The reason I did not recharge it was that so far I had been operating above the recommended 5.25V recommended by Frank. It had been shown in previous tests that the

voltage drops quickly from 6.07 volts when recharged, so I wanted to see how it did starting at a lower voltage but still well above 5.25V. Here are the results:



Trial 1 shows an equilibrium being reached between 5.498V and 5.434V after 122 minutes of the 180 minute test.

Trial 2 has a tenth of the duty cycle as trial 1 and doesn't quite reach equilibrium after three hours. It might eventually reach equilibrium but shows that a faster duty cycle works just as well.

Trial 3 has the same duty cycle as Trial 1 but half the frequency. It achieves close to equilibrium after 104 minutes but at the end of three hours there are indications that it will still drop a bit the next hour.

Once equilibrium is reached the cell should be able to sustain that voltage indefinitely. If the discharge were continuous I would be able to easily calculate power and energy. Even if it sustains at just 5.25V I think that I would have to divide the power by the duty cycle to get a more reliable reading on power.

Any thoughts out there on this?

2 ^ v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

I have a thought. Once, Shaun was asked about COP. He said, if I remember properly, something like the concept of COP doesn't make sense because the Orbo could go on almost forever. Actually, you probably shouldn't take anything that I say seriously because I don't know what I'm talking about...

^ v • Reply • Share ›

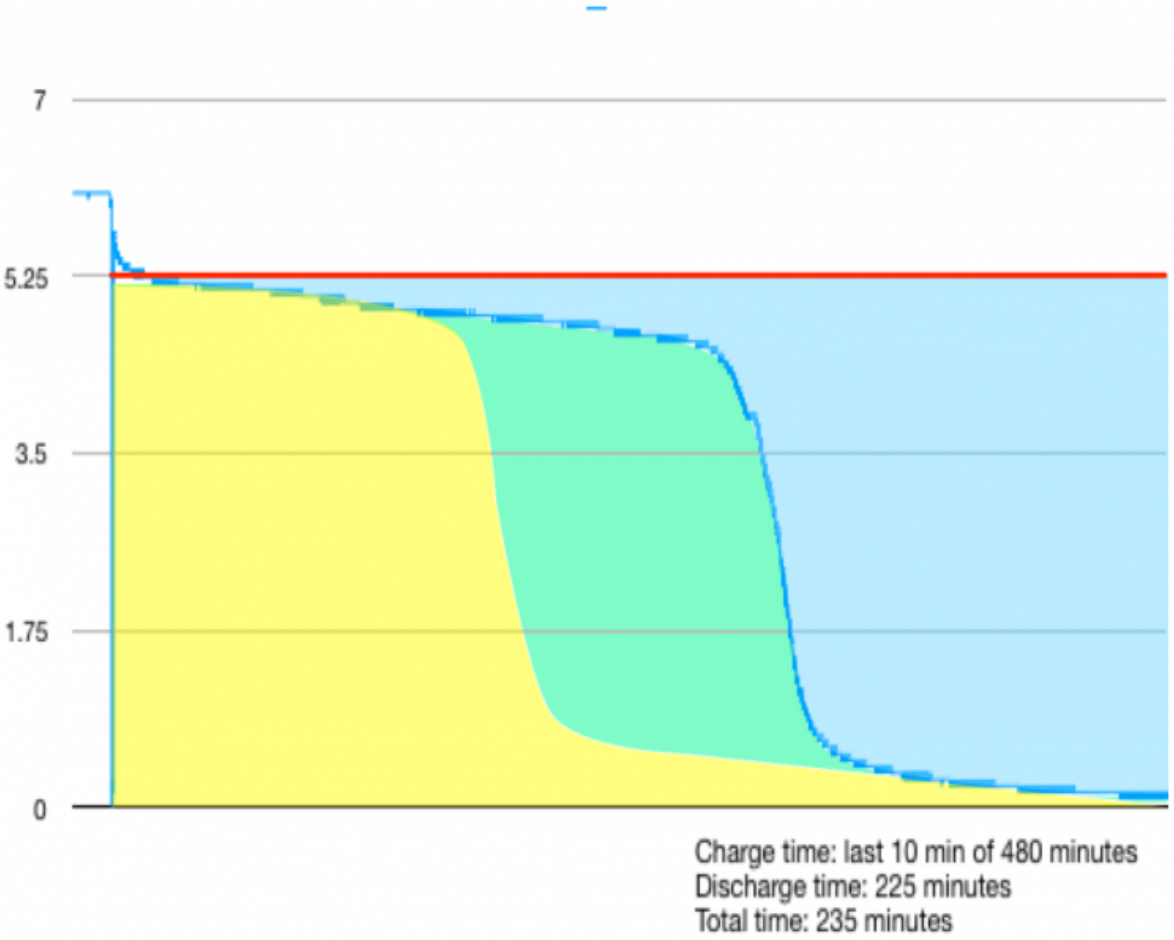
gdaigle ➚ **Mark** • 2 years ago

I don't recall that from Shaun, but I could see him taking that point of view. On the other hand, we can measure the entire power output when you drain a cell. If you use that and its timeframe from which to base your Watt hours, then you could calculate

the power out from the cell once it reached equilibrium over the same timeframe to get an estimate of COP.

Using the image below, which is from an earlier discharge of the cell, let's assume a continuous power output at 5.25V (red line) once equilibrium is reached. If you then color the area under the red line down to the blue trace of the scope (blue area), that would be the difference, which you could also call the COP.

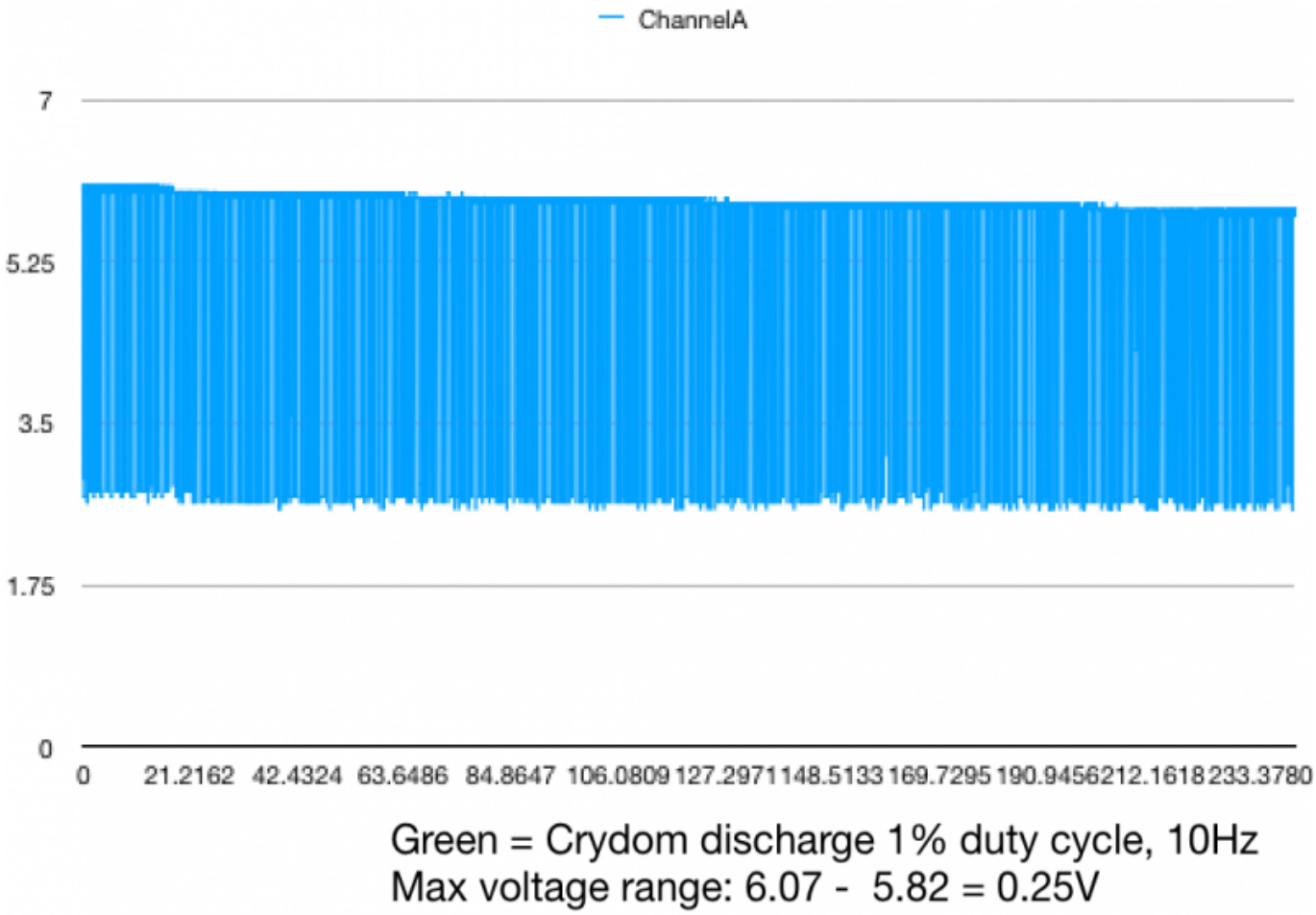
As a comparison, I flipped the blue area and placed it under the discharge curve (yellow area) what remains (green area) is the difference between the two curves.



1 · Reply · Share ›

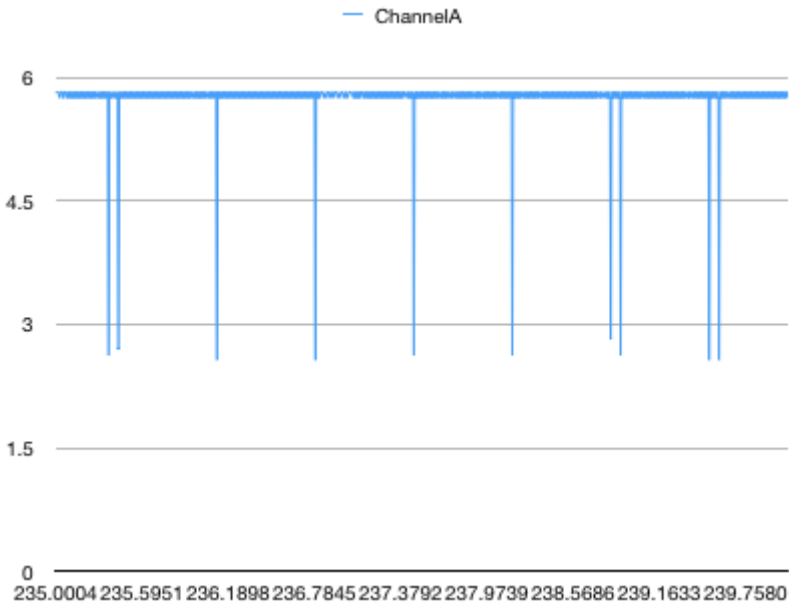
gdaigle • 2 years ago

Some success with a new setup. I didn't have to purchase a new SSR as I was able to create a .csv file and upload that to my scope to give me a 0.05% duty cycle [earlier I reported 1% and that was incorrect] at 10Hz. That closes the circuit and drains the cell through its 91.6 ohm resistor load 0.05% of every cycle, or 0.00005 seconds every 0.1 second cycle. The resultant scope trace only dropped 0.25V over four hours:

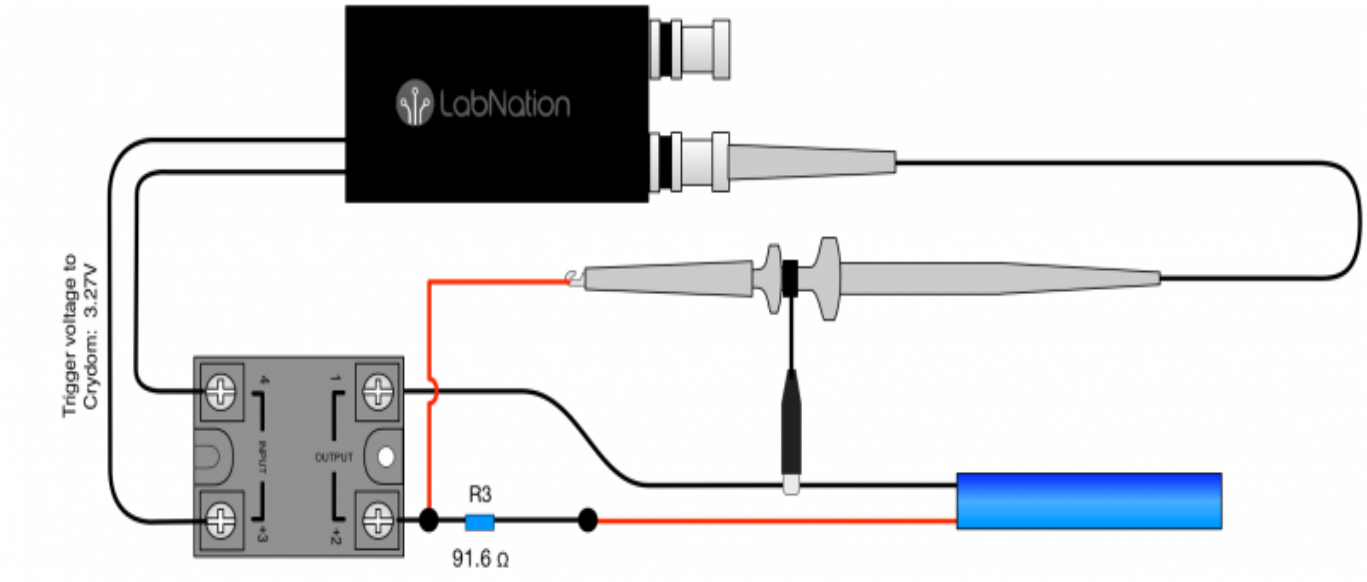


Green = Crydom discharge 1% duty cycle, 10Hz
Max voltage range: 6.07 - 5.82 = 0.25V

There are occasional drops in voltage down to around 2.7V. I record only about every 10th sample, so the drops could be the times when the frequency coincides with the drain of the cell when the circuit is closed. They seem very regular in occurrence. Here is a 5 minute section of the tracings showing the occasional drop in voltage encountered.



Here is the circuit for the Crydom and the probes I used:



Now the issue is how to calculate the power output of the cell when it is being drained only 1% of each cycle. I'm not quite sure what the formula would be for that.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

Not much else to report with the new probe settings. So far I've only been able to achieve a duty cycle with my scope as low as 12%. Even with a 100mHz cycle (1.2 sec charging, 8.8 sec recovering) the cell still discharges down through 5.25V and has a trace profile almost identical to that of a cell going through a straight discharge.

This indicates that either there is insufficient time in the recovering portion of the duty cycle (circuit open) to realign the domains, or that the length of the duty cycle (closed circuit) is draining the cell too much.

I'm checking with the manufacturer to see if I can lower the duty cycle even more for my scope, but may need to get a SSR with a different voltage range before I can achieve that.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

My plan was to start at the end of the scale where there was a wide recovery time for the domains to realign, then reduce that time until they began to show signs of insufficient recovery. Beginning voltage through the circuit was 5.50V with a quick spike to 5.88V when the Crydom was turned off. Cell was overcharged a bit above the recommended 5.25V, but previous tests showed no damage up to even 6.07V so it should be okay.

I began with results from my prior test where the analog out to the Crydom was adjusted to a point where the cell just barely stopped charging (using a VDC power source in the circuit). I employed those settings of duty cycle and recovery width between pulses as the upper and lower points of a range to aim for. I then started with the same frequency as before (1Hz), duty cycle of 12% (recovery portion of cycle 88%) which meant a 880mS recovery time between pulses. Each test lasted 30 minutes to achieve a reliable baseline. However, I blew through that range pretty quickly.

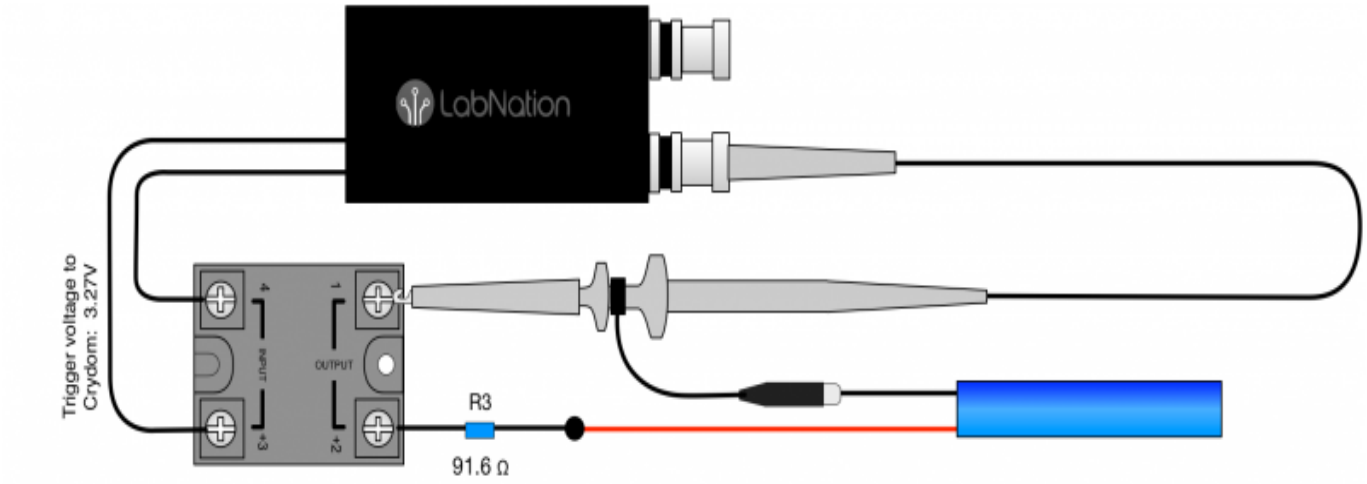
From there I created a spreadsheet and adjusted the analog signal to the Crydom to result in about a 3% change in the duty cycle each test. When I reached a point with the 1Hz test where the minimum voltage out to the Crydom would no longer trip the SSR I upped by frequency to 5Hz and started with a minimum analog signal out to the Crydom that would give me roughly the same recovery width between pulses as before, then kept reducing the recovery width.

Tests ranged from:
Frequency: 1 Hz (1 sec) to 100 Hz (10 mS)
Duty cycle on: 12% to 98%
Duty cycle off: 88% to 2%
Pulse (circuit closed): 890 mS to 8.4 mS
Recovery (circuit open): 0.2 mS to 880 mS

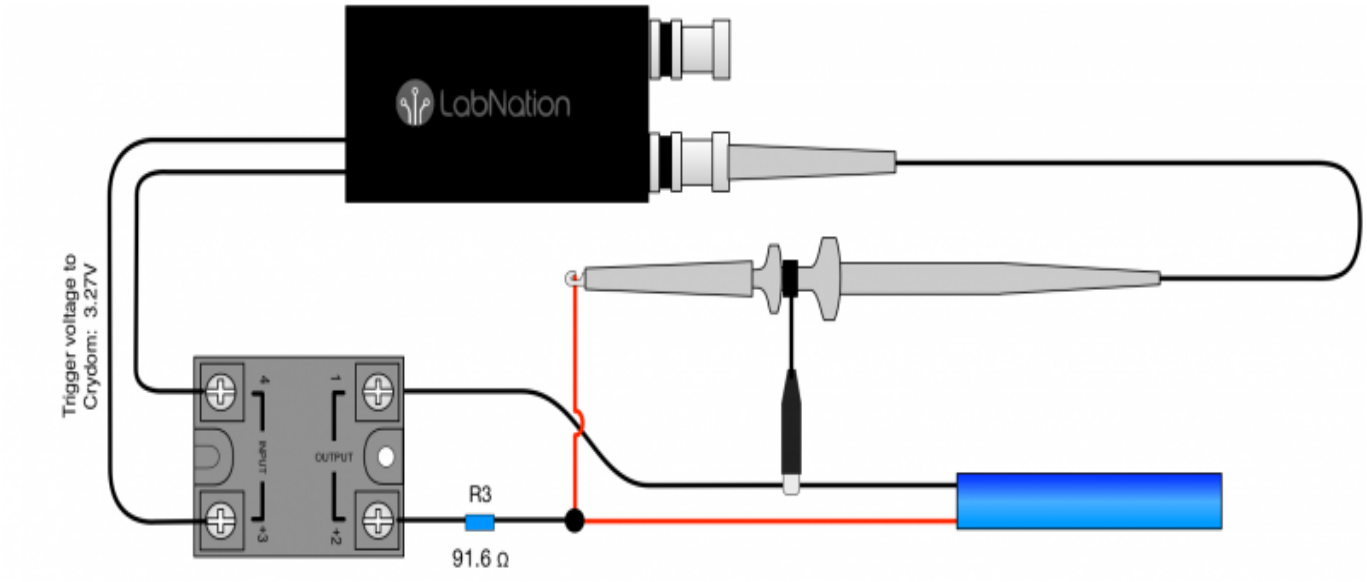
So far the settings were always sufficient for the domains to realign themselves. In other words, the cell never dropped in voltage, which seemed odd. 56 tests over 33 straight hours of the cell being depleted by the 91.6 ohm resistor in the circuit with no decrement in power from the cell. That should not happen.

So I looked at the circuit, which seemed okay, but perhaps the probes were placed wrong.

I was using this layout for the probes:



But probably should have been using this setup with the probes across the cell leads:



Darn. I'll try again with this alternate setting for the probes and begin using the largest recovery period for the realignment to happen. Let's see what happens then.

1 · Reply · Share ›

gdaigle · 2 years ago

For the past day or so I've been engaged in another set of tests. I noted in the last post that I was able to sustain the charge on the cell by varying the maximum voltage out to trigger the Crydom. At 3.0V it recharged the cell, and at 2.95V is marginally sustained the cell by marginally reducing the average (mean) voltage.

So having reached that milestone it's time to ditch the power source and instead go back to tests Shaun performed last year (before Steorn's demise) where he just sent pulses to the Crydom completing the circuit that depletes the cell, and showed how it could self-sustain voltage in the cell if the width of the pulse was narrow enough and the timing and duty cycle of the pulse allowed sufficient time for the domains to realign.

So I'll be doing a series where I try different settings of the pulse triggering the Crydom, varying the pulse frequency, max voltage, and more importantly the minimum voltage. I've found that I can have very discrete control of the pulse to the Crydom if I set the max voltage of the analog trigger pulse out high and vary the minimum voltage to achieve different duty cycles (pulse on divided by pulse off).

My intent is to set a frequency and max voltage and then vary the minimum voltage of the pulse (using the triangular shaped wave) to change the duty cycle. I'll run this through increments of 100mV until the cell begins to deplete, recharge the cell back to it optimum voltage (between 5.25V and 6.01V), change a setting, and retest the range.

I hope to report back by later today or tomorrow with first results.

3 · Reply · Share ›

Mark ➚ **gdaigle** · 2 years ago

I ain't no expert in this stuff, but this sounds, to me, like the coolest test, yet!

1 · Reply · Share ›

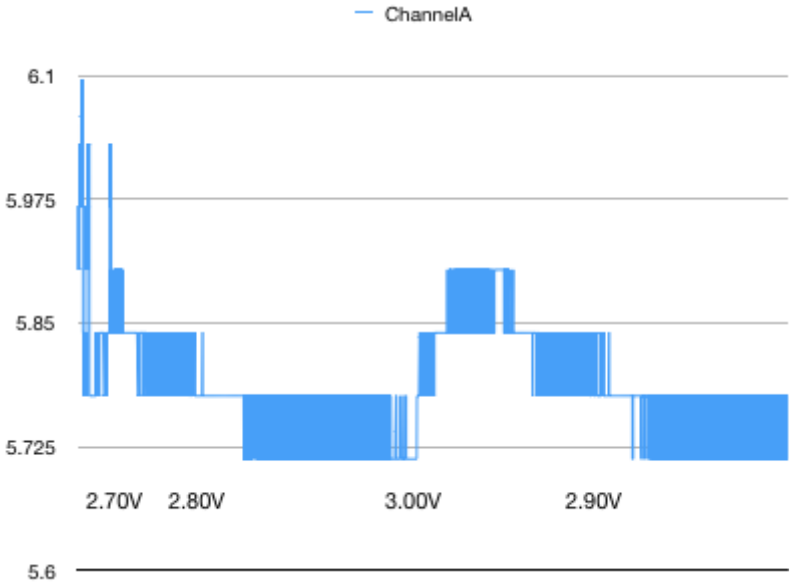
gdaigle • 2 years ago

For the followup to the previous post, I simplified the circuit by supplying a transformer voltage of 6.07V to the cell through the Crydom and lowered the max analog voltage out to trigger the Crydom.

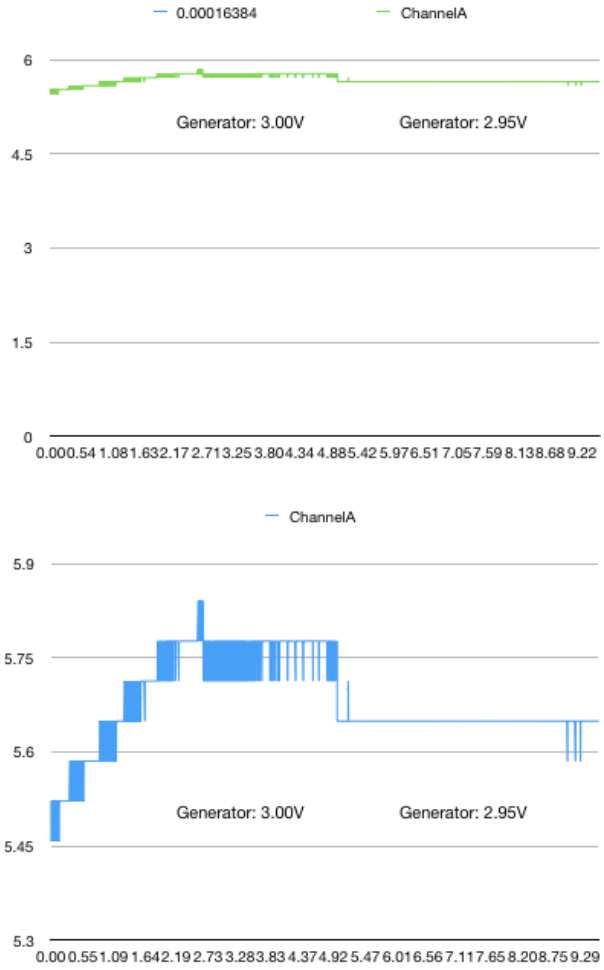
I kept the Generator options open in the scope so that I could change the voltage manually. Since the previous test was in sufficient to recharge the cell I first set the scope's analog signal out to 2.5V max to trigger the Crydom just above the minimum trigger voltage of 2.3V found in the last experiment. It was insufficient and the cell lost voltage quickly with the 91.6 ohm resistor across its leads as a drain.

I then reset the max voltage out to 2.5V, 2.6V, each time watching the trace and at each setting the voltage was depleted from the cell, presumably because the pulses to the Crydom were very narrow and of insufficient duration to recharge the cell.

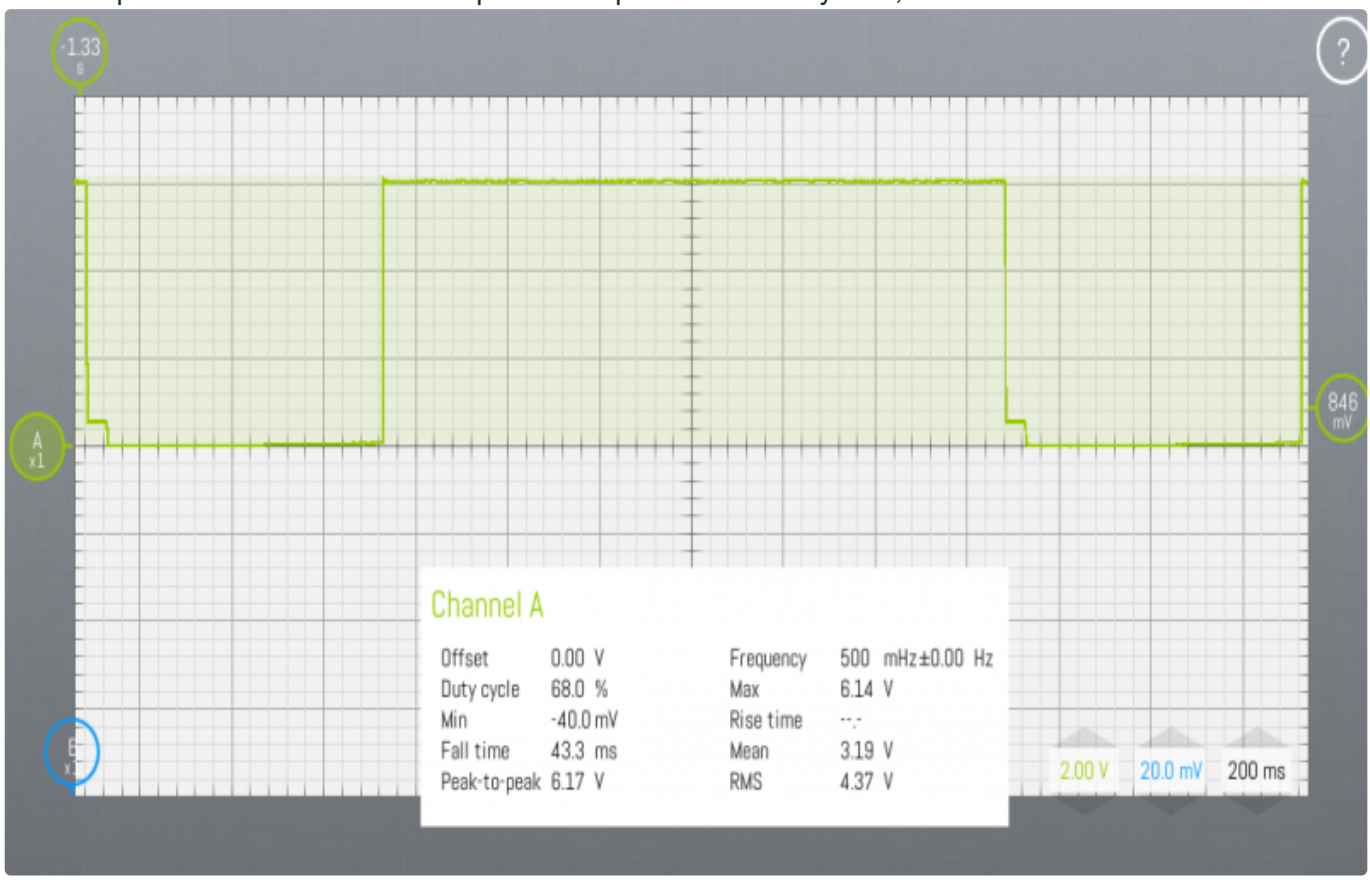
I then did another series beginning at 2.7V and worked up toward 3.27V, but at 3.0V I saw that the trace began to recharge the cell. I then brought the cell down to 2.9V and the voltage began to drop again. Here is the trace:



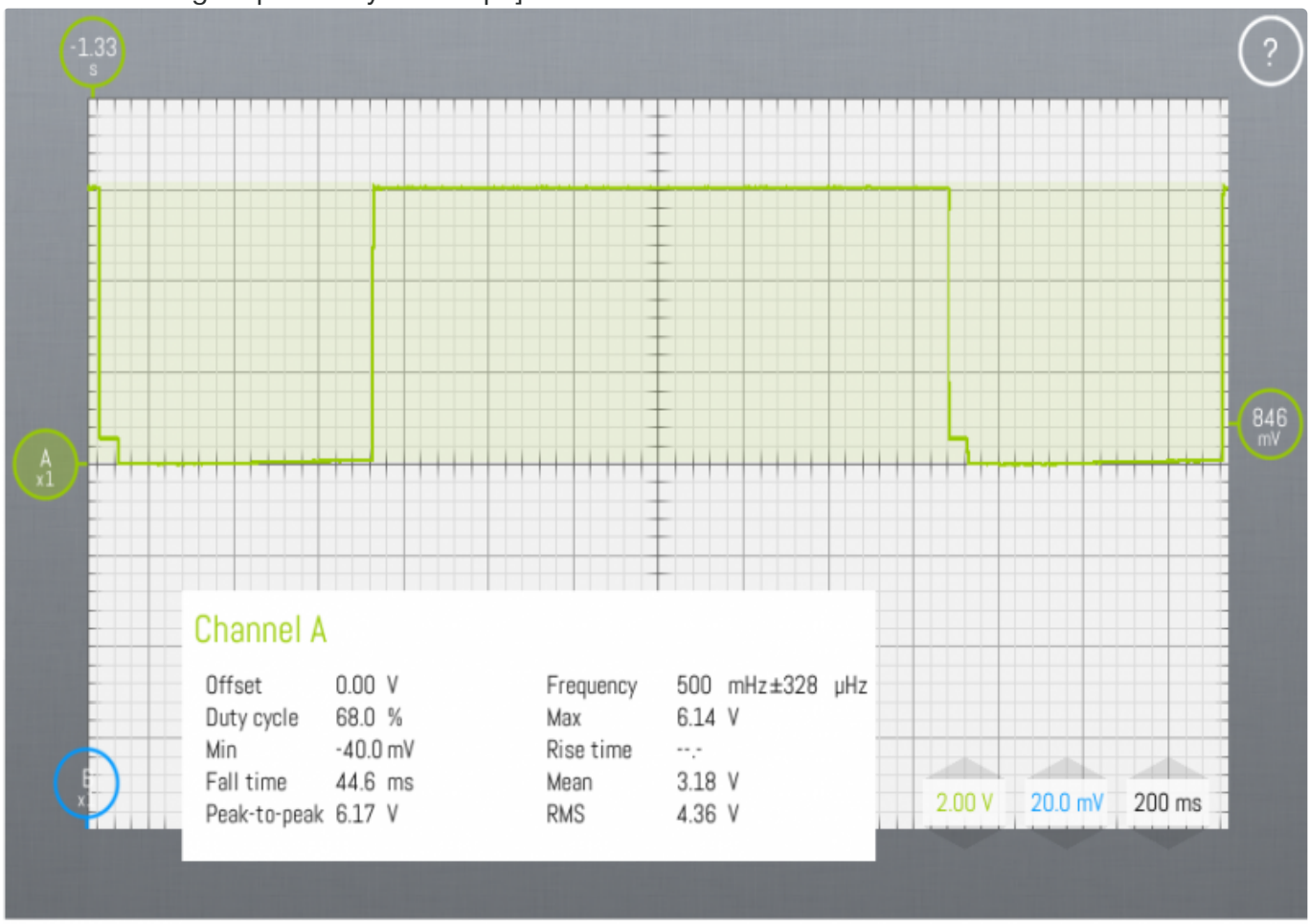
I then narrowed the pulse out to between 3.0V and 2.95V and found that 2.95V just barely lowered the voltage, so somewhere in between must be the "sweet spot" where the voltage of the cell is just maintained. Here are two traces of the same recording, the top in a range beginning at 0V and the bottom trace just capturing the variance in voltages recorded:



For comparison of the width of the pulses output from the Crydom, here is 3.00V:

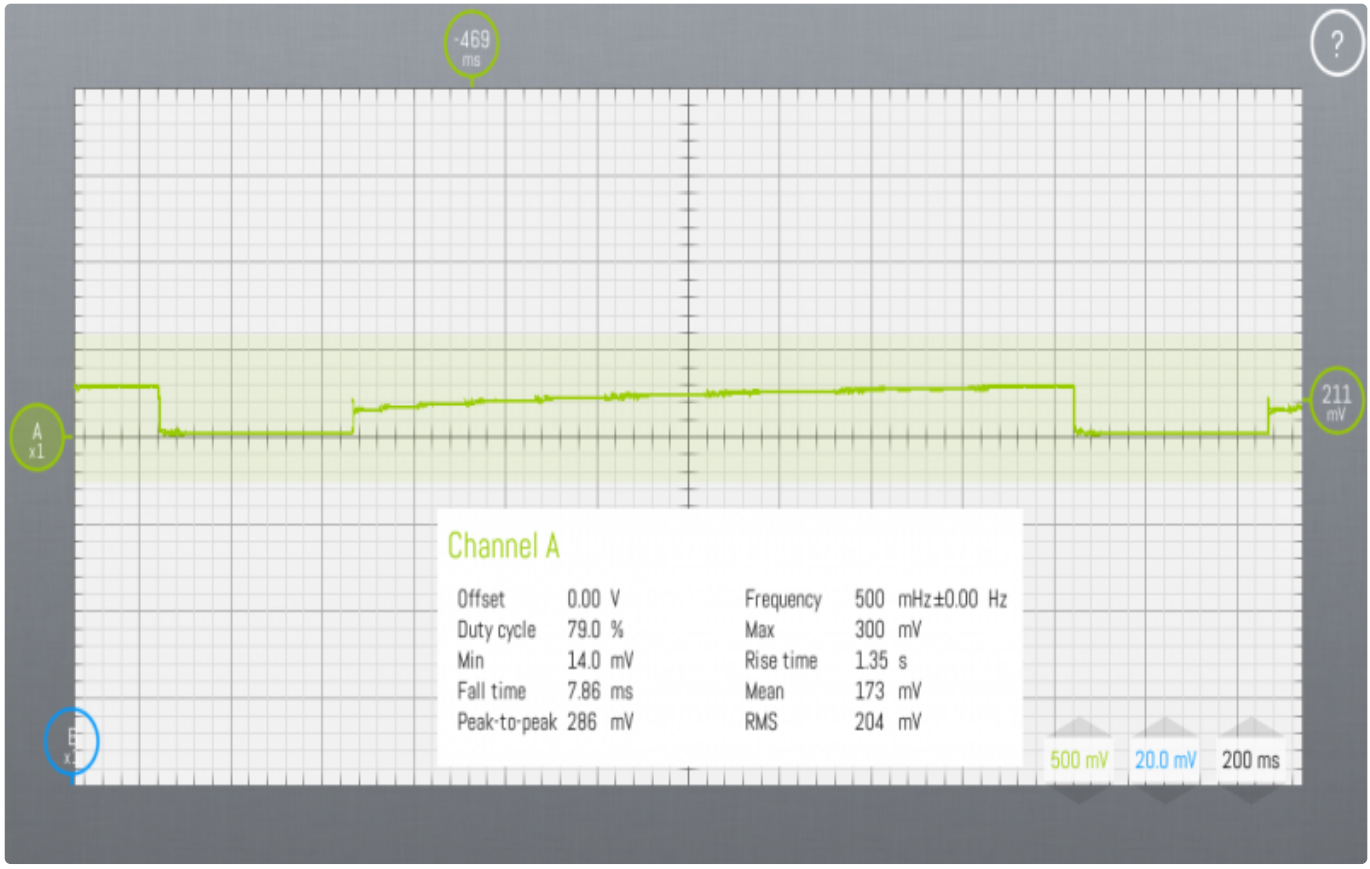


And here is 2.95V. Note that this pulse out from the Crydom is much narrower [Correction: it is about the same as before with the same duty cycle, but the max voltage does have an effect by lowering the mean voltage reported by the scope]:



Note that the above voltages going out from the Crydom were measured at the full voltage of the source because the draining 91.6 ohm resistor was not part of these measurements.

Putting that draining resistor into the circuit lowers the voltage measured across the outputs of the Crydom. It starts as high as 400mV, but then stabilizes down to 300mV. In the below pulse trace the actual voltage to the Crydom is 3.27V, higher than in my actual test (which is why the pulse width is wider than in the 2.95V or 3.00V setting).

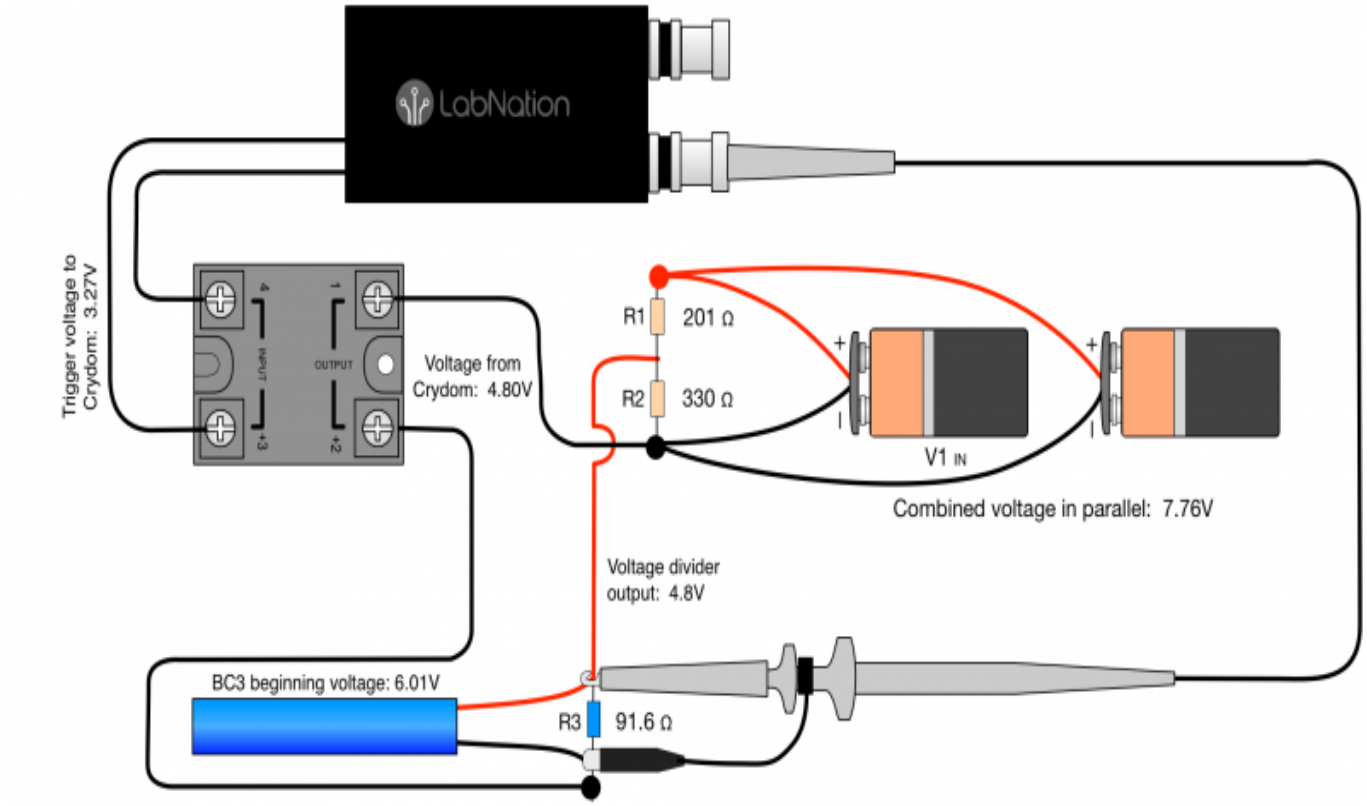


So I think it's safe to say that this is the range in which the cell will be recharged, by a combination of voltage and duration of the pulse. I don't know that the pulses are actually this wide from the O-Cube circuit, so it might be that a higher voltage (up to that supplied by two 9V batteries) might recharge the cells but at a shorter pulse width.

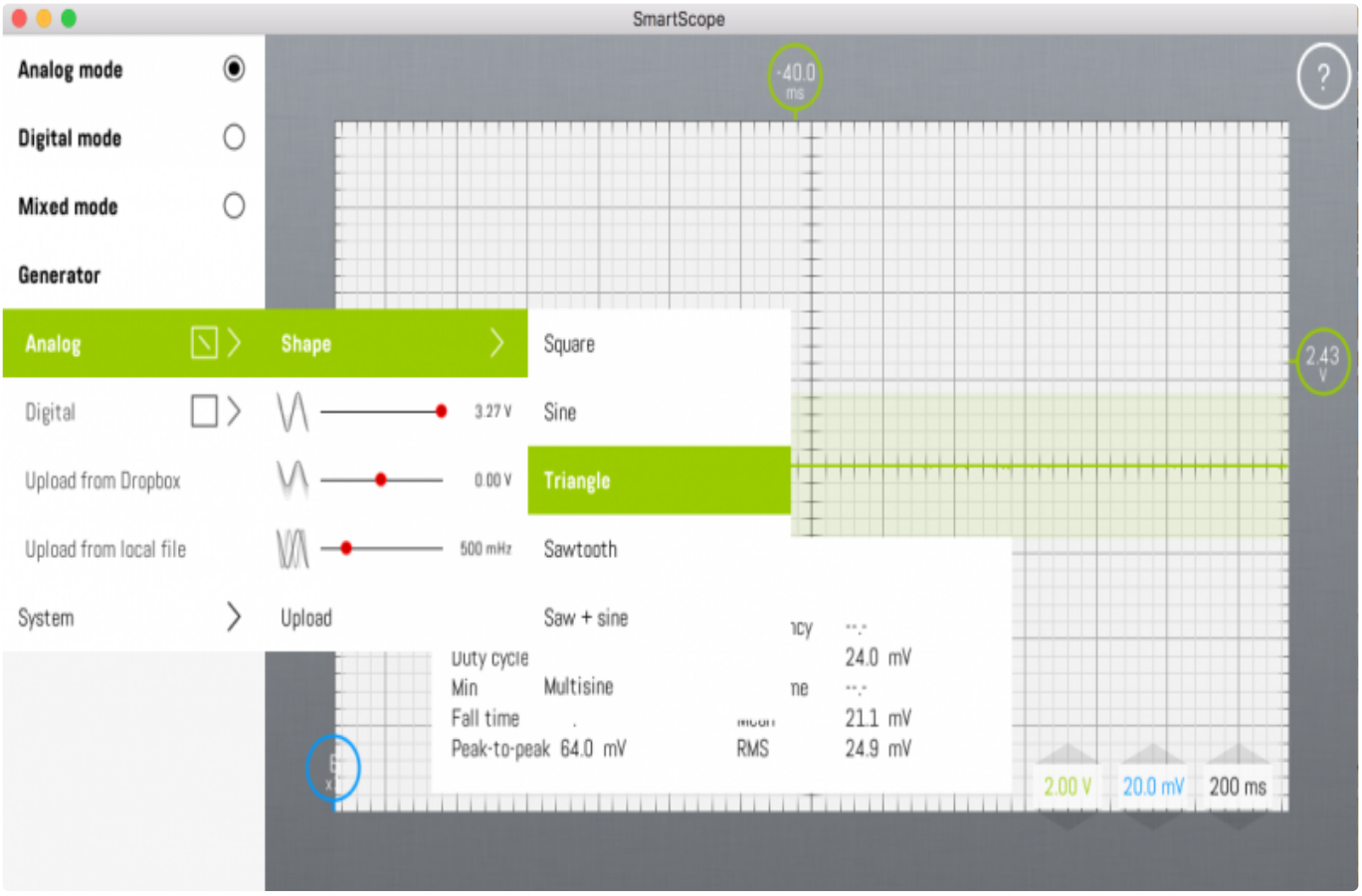
2 ^ v • Reply • Share ›

gdaigle • 2 years ago

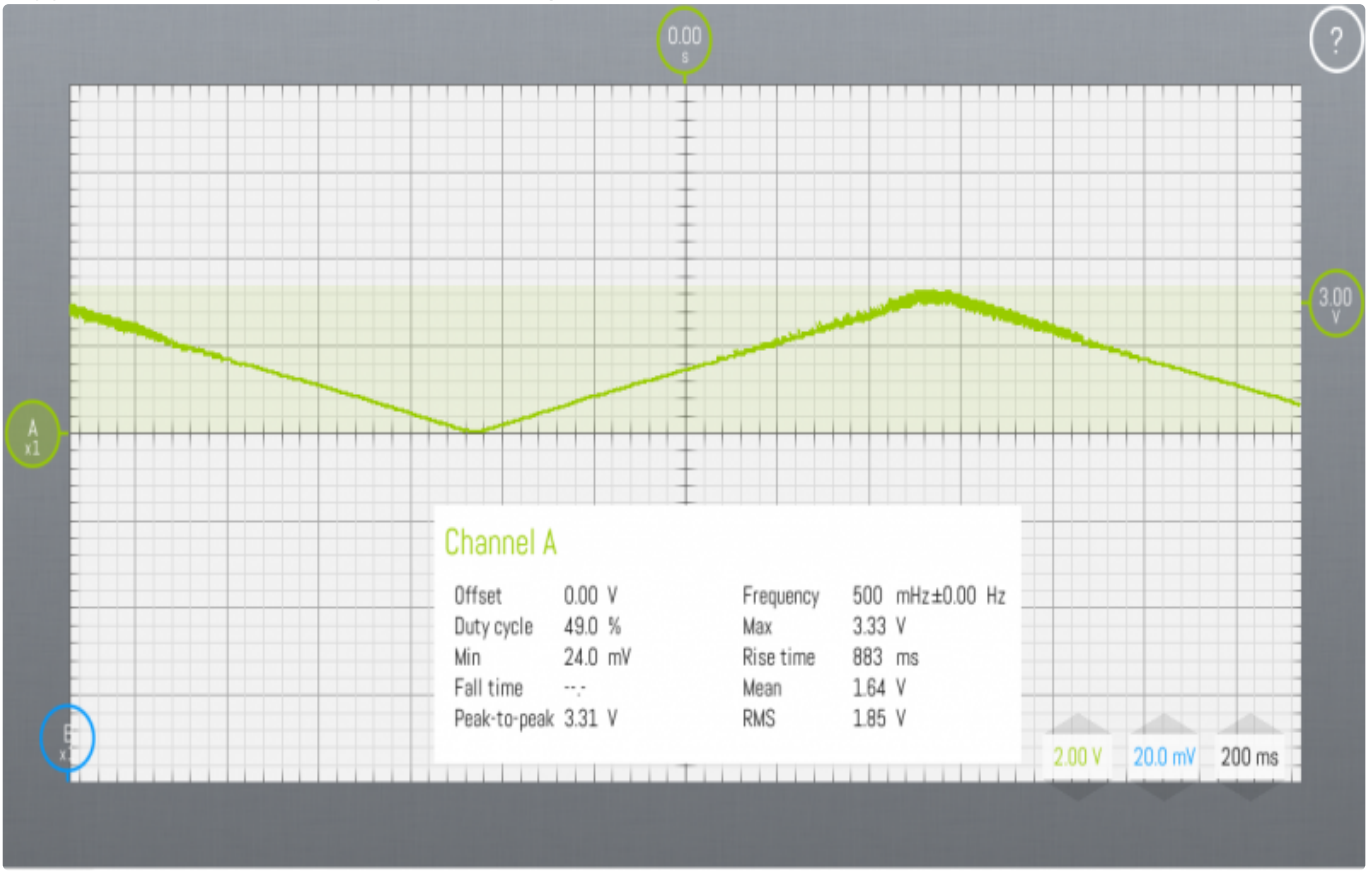
For the previous post, here is the circuit:



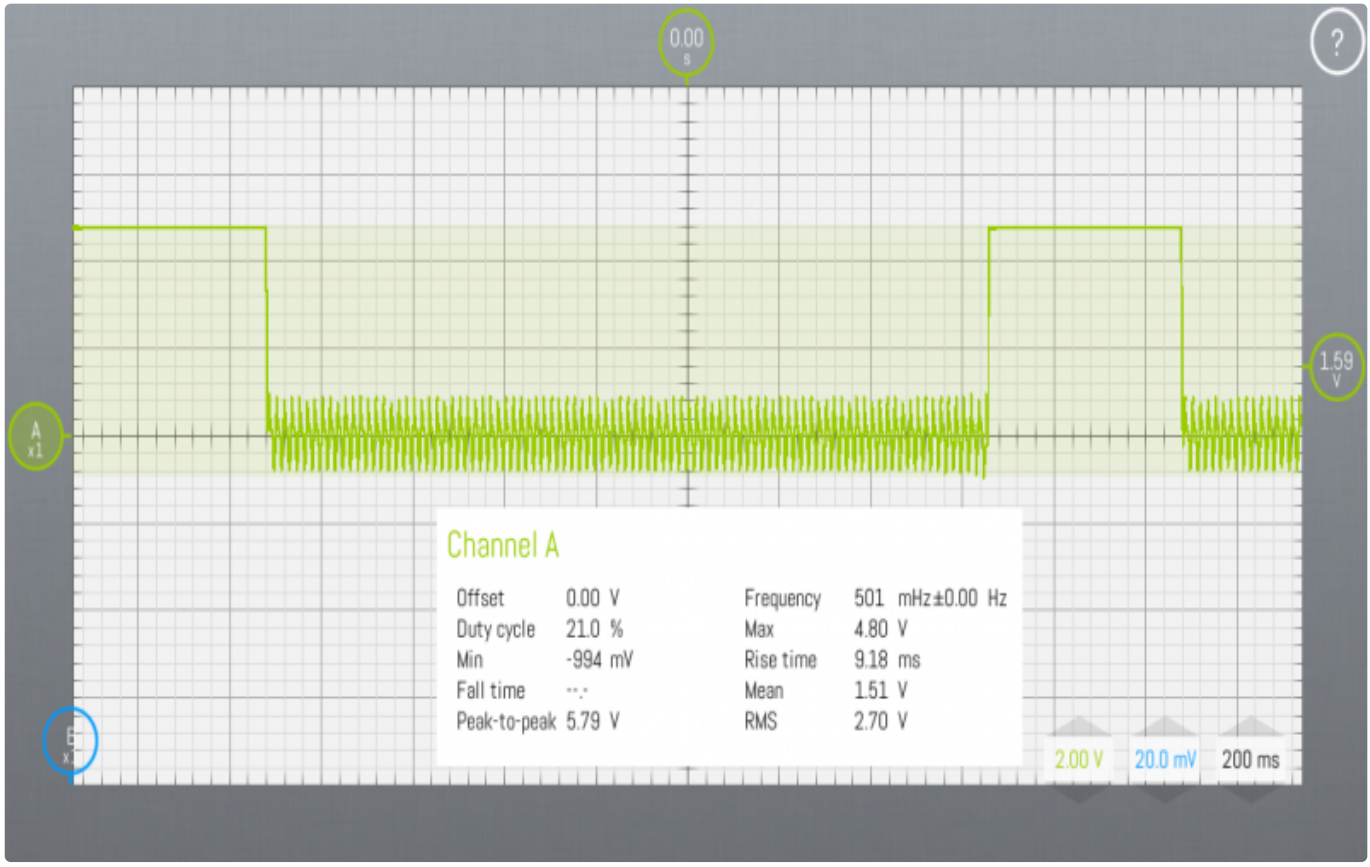
Scope settings:
Volts/div: 2.0
Frequency: 20ms (though 200ms is shown in this grab)
Analog signal out to Crydom:
Triangle shape pulse
3.27V analog out max
0V analog out min
500mHz (.5/sec)



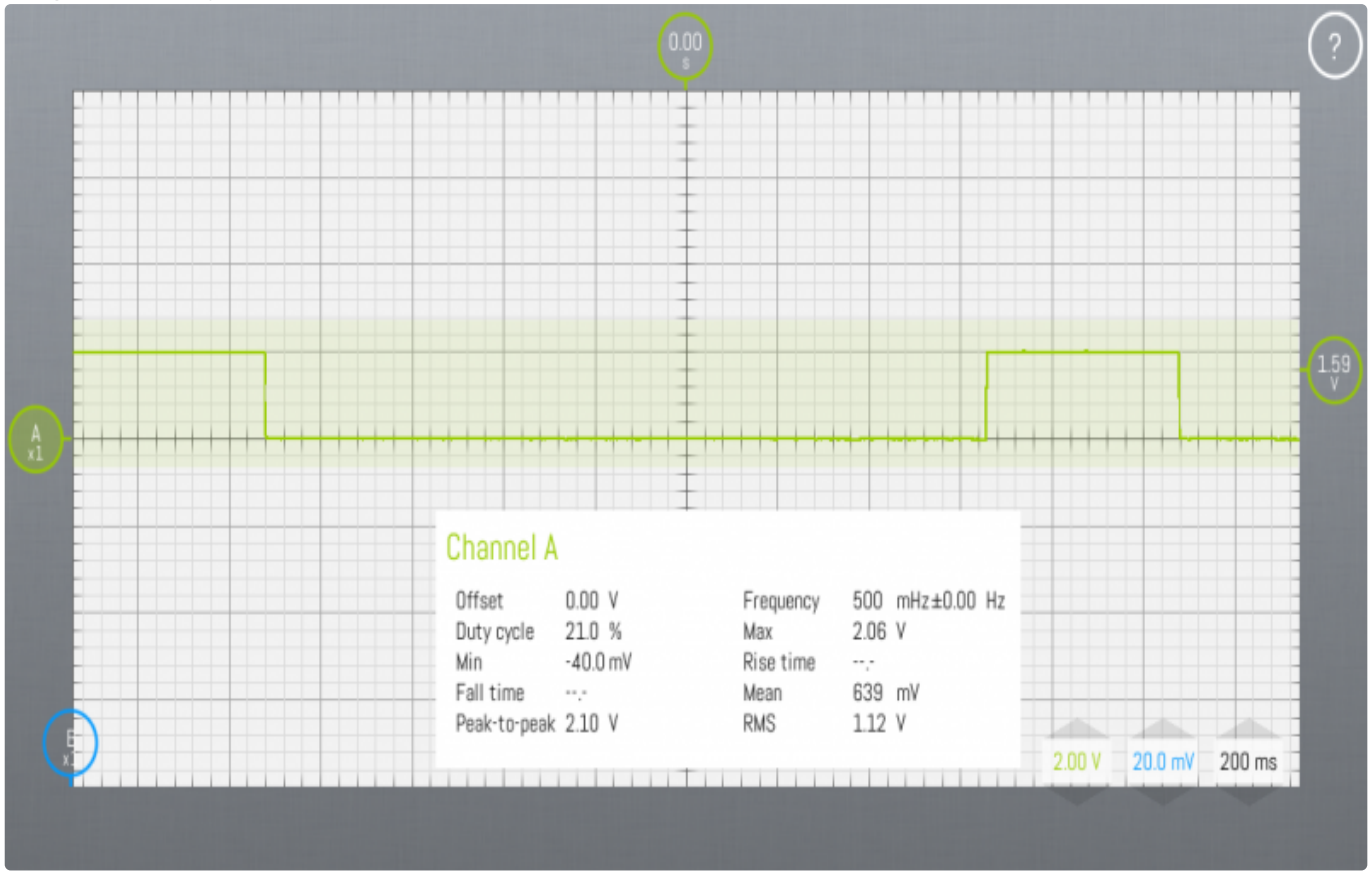
This is the triangular shaped analog trigger signal out from scope and wired to Crydom input. Crydom triggers at about 2.3V through the 3.27V peak and back down to 2.3V:



Resultant output from Crydom without 91.6 ohm resistor in the circuit that drains cell: 4.80V



Output from Crydom with 91.6 ohm resistor in the circuit that drains cell: 2.06V



Other than the odd tooth-shaped forms below 1.5V the entire trace shows that the recharging voltage is either insufficient in voltage or frequency to recharge the cell.

The next step would be to both increase the voltage going to the cell or the duration of the pulses to the cell.

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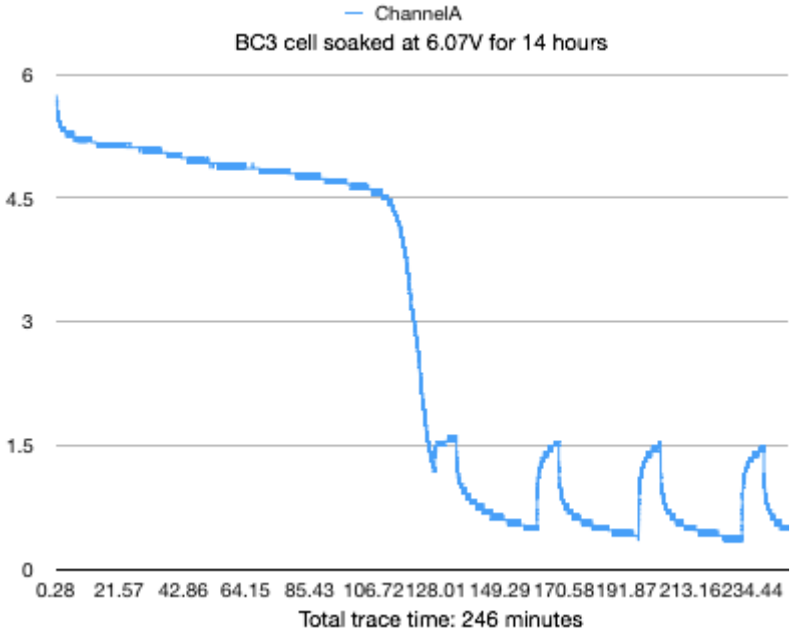
gdaigle • 2 years ago

This was a bit unexpected. I did another recharge of the cell using pulses from the Crydom trying to get a different result than just a steady state by widening the pulse to the Crydom, resulting in it closing its circuit for about quarter of a second every two seconds.

I was using these settings:
Voltage from combined two 9V batteries: 17.76V
Voltage divider now outputs 4.80V
Settings of scope:
Triangle shape pulse
3.27V analog out max to Crydom
0V analog out min to Crydom
500mHz (.5/sec)
output from Crydom: max 1.50V
output from Crydom min: .325V

So the output wasn't ideal, but I ran it anyway. Here is the result:



Even though the pulses were every 2 seconds once it lowered to a certain point the cell seemed to go into a cycle where it would regain to a certain peak and then slowly discharge in cycles of about 27 minutes. I can't quite account for that.

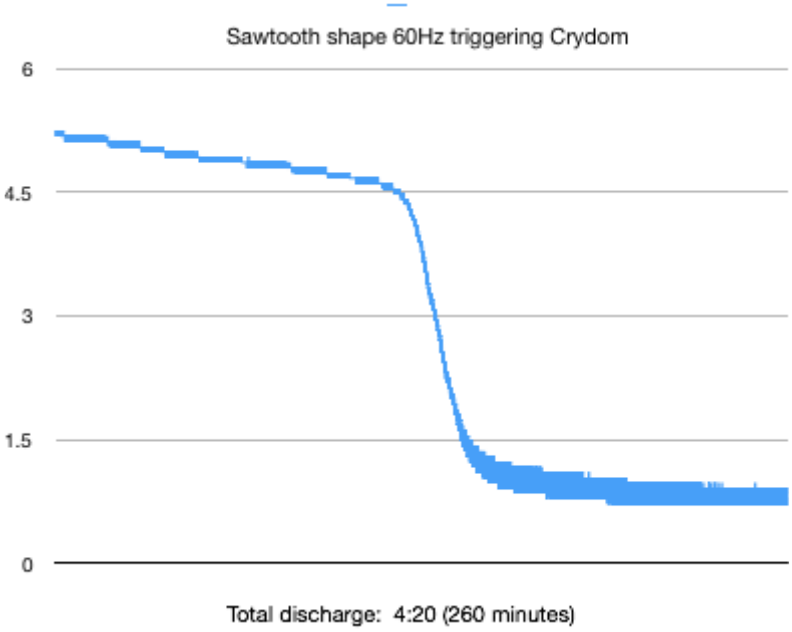
The peak did slightly decrease each cycle, which I presume was due to the slight lowering of the voltage of the batteries over time.

2 Reply • Share ›

gdaigle • 2 years ago

Second Crydom test 60Hz

I just finished a test that used a sawtooth signal (narrow peak) at 60Hz to trigger the Crydom. What it is doing is sustaining the cell at 787mV after a long discharge rather than going down to below 88mV. That is something I have not seen before, so that's good. Note the thick trace at the end that sustains:



Right now it isn't recharging the cell and sustaining it at a high voltage (4.5-5.25V) because the output signal is too narrow and only puts out 2.2V before the signal gets cut off:

I'll work to widen it so that it can charge with the full 5.66V out of my voltage divider — maybe use a wider sine function to trigger the Crydom and also vary the pulse width.

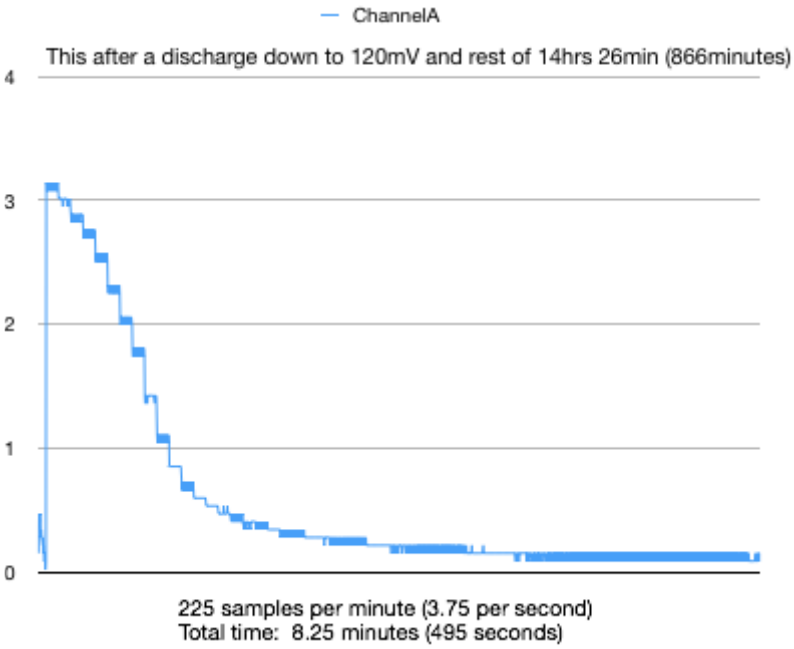
The voltage divider with the Crydom is the same as I posted previously but using a 201 ohm resistor and a 330 ohm resistor instead of the previous use of 23.5K and 200K ohm resistors that reduced the amperage too much (I believe).

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

One unexpected outcome of the test from earlier today was that I put the BC3 cell aside and 14hrs+ later decided to try recharging it again to 6.07V. First I had to discharge it again, but upon starting the discharge I realized that it had self-recharged itself to 3.14V.

Previously, the self-recharging had been limited to small fractions of that amount. But since I had biased it to 6.07V over 8 hours it sought to realign its domains quite vigorously. Here is the scope trace:



Of course, it was only a 8.25 minute discharge, much shorter in length than after the full 8hr charge, yet the voltage was impressive.

1 ^ v • Reply • Share ›

Frank Acland ECW Admin ➚ gdaigle • 2 years ago

I've seen that kind of thing happen, Greg -- unpredictably.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

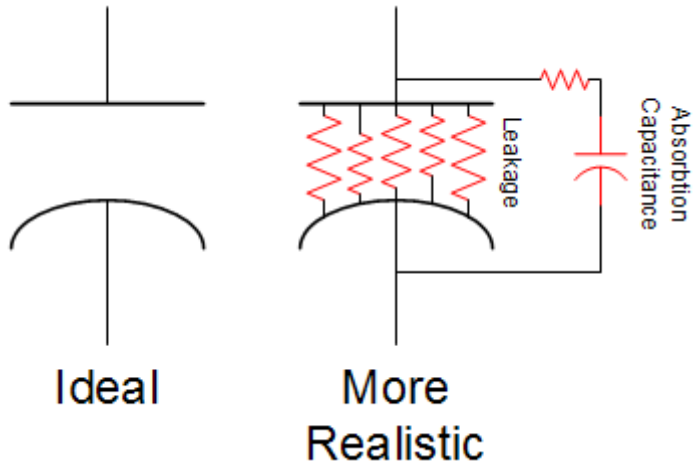
One of the fundamental questions about the nature of Steorn's blue cells is whether they are batteries, capacitors, or something altogether different, as Shaun has contended for years. I have already shown single full discharges from 6.07V down to 0.087V, from 5.24V down to 0.215V, and

from 5.02V down to 0.024V and they all show profiles different from typical capacitors. However, none of the recharging that has preceded the discharges are for over 2 hours.

This is important because David Cook, the person who runs the www.robotroom.com website and clued me in on the rapid rebound of the cells as being due to “voltage rebound” (an artifact of some capacitors) said that the rebound is likely a characteristic of the chemistry of the capacitor and nothing else. His site says:

“A clue is that the longer you charge the capacitor, the more energy reappears. Another clue is that the longer you short the capacitor, the less energy reappears. It turns out that capacitors store energy in multiple forms. There’s the classic model of charges accumulating on the plates, but there are other storage forms, such as a chemical change. The plates can charge and discharge quickly. Chemical changes happen more slowly. It’s almost as though you have two capacitors connected together. Think of the internal second capacitor as being a much smaller capacitance and having a high-value resistor in series. Thus, it can’t restore the full voltage of capacitor and it takes longer to charge and discharge."

Again, here is his image:



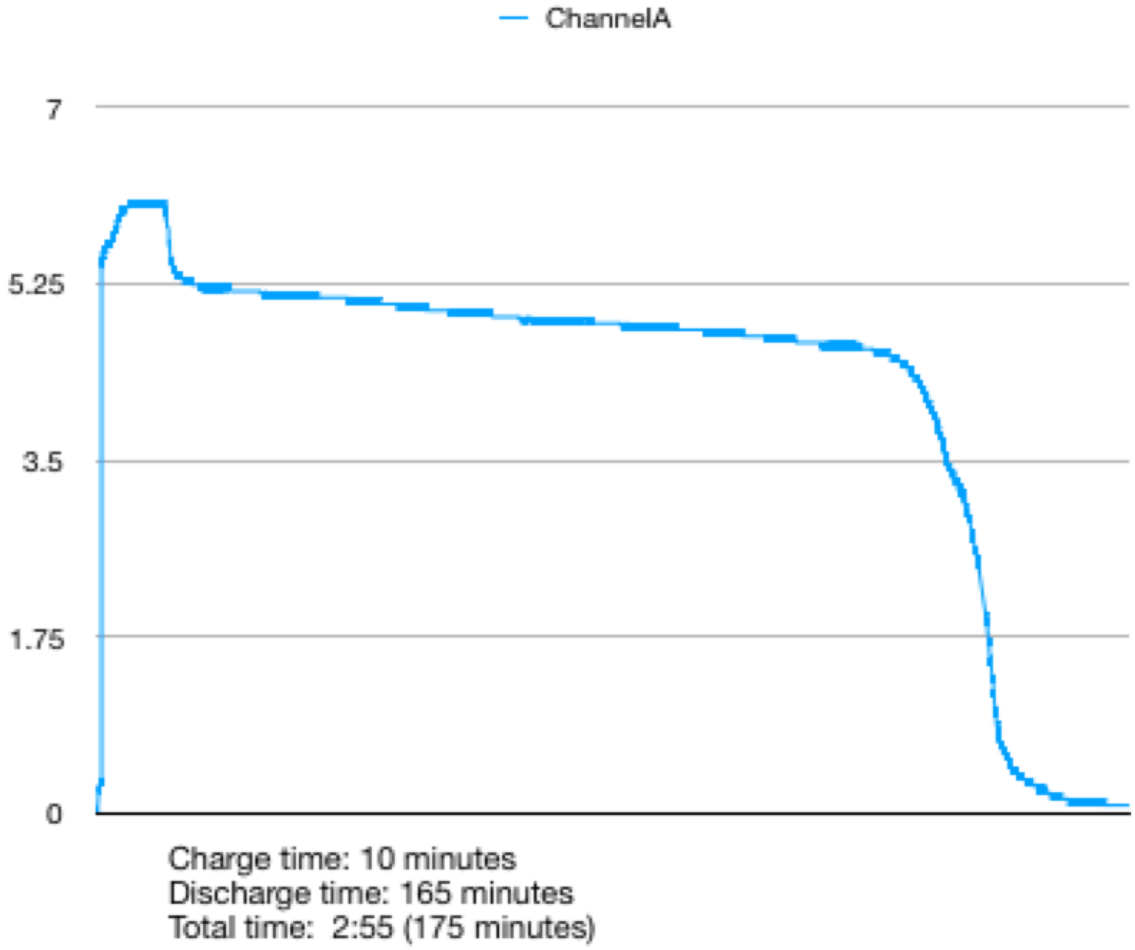
I have already shown how the discharge of the cells are very unlike that of a normal capacitor and show a curve more closely resembling that of the hysteresis curve of a soft magnet. I have also shown how a blue cell when charged for 120 minutes and discharged down to 4.5V has a scope trace almost indistinguishable from that of a 10 minute recharge and a 5 minute recharge.

What I need is to compare a 10 minute recharge and then a much longer charge, like an 8 hour recharge to see if the profile of the full discharge that follows are similar. If the 8 hour recharge holds a charge much larger or for much longer then capacitor chemistry may be involved. If they are much closer in discharge profile, then it would show that the blue cells are (again) not typical capacitors and chemistry is not involved. So far, the profile curves of the blue cells indicate domains going into alignment, and then losing alignment (typical hysteresis).

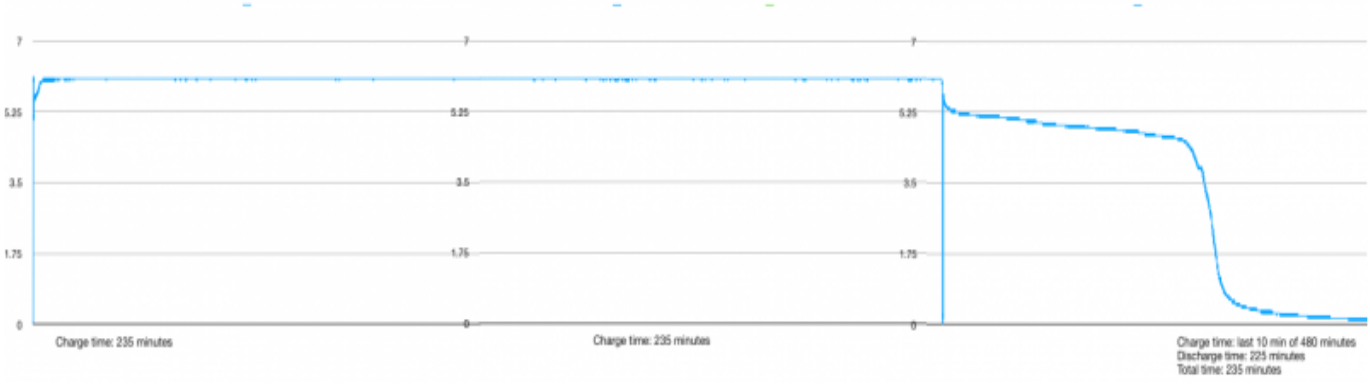
To test this I first used my voltage divider set to output 5.27V, but using Kohm resistors in the setup the amperage was too low and after 21 hours the cell barely charged over 3.4V. The same when I used a 140K ohm resistor in series with a 6.07VDC 2000mA transformer. So I charged directly with

the 6.07VDC transformer hoping that the cell would not be damaged even though I understand it was designed to handle 5.25V.

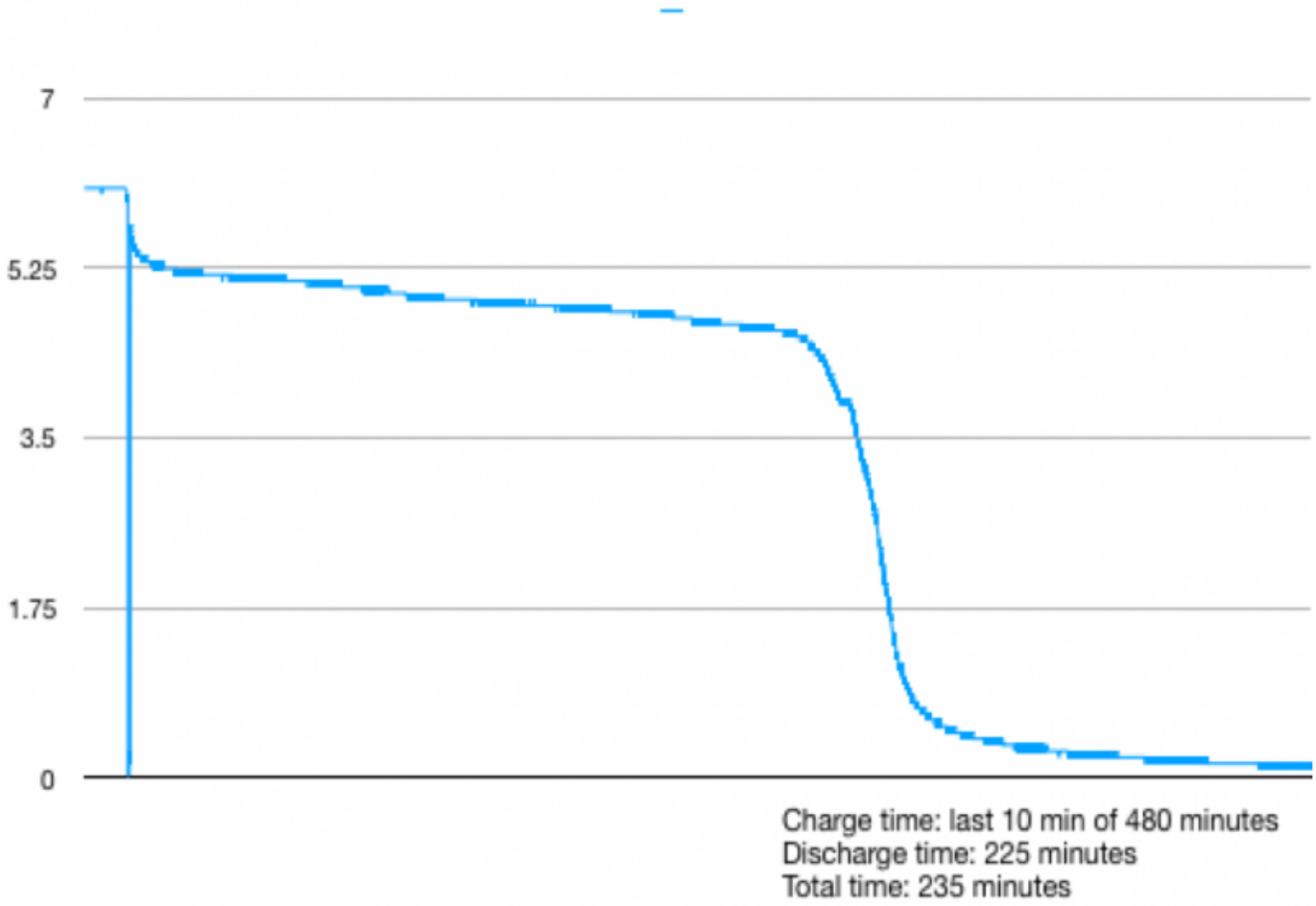
Here are the results for the 10 minute recharge after depleting the cell to 87.7mV:



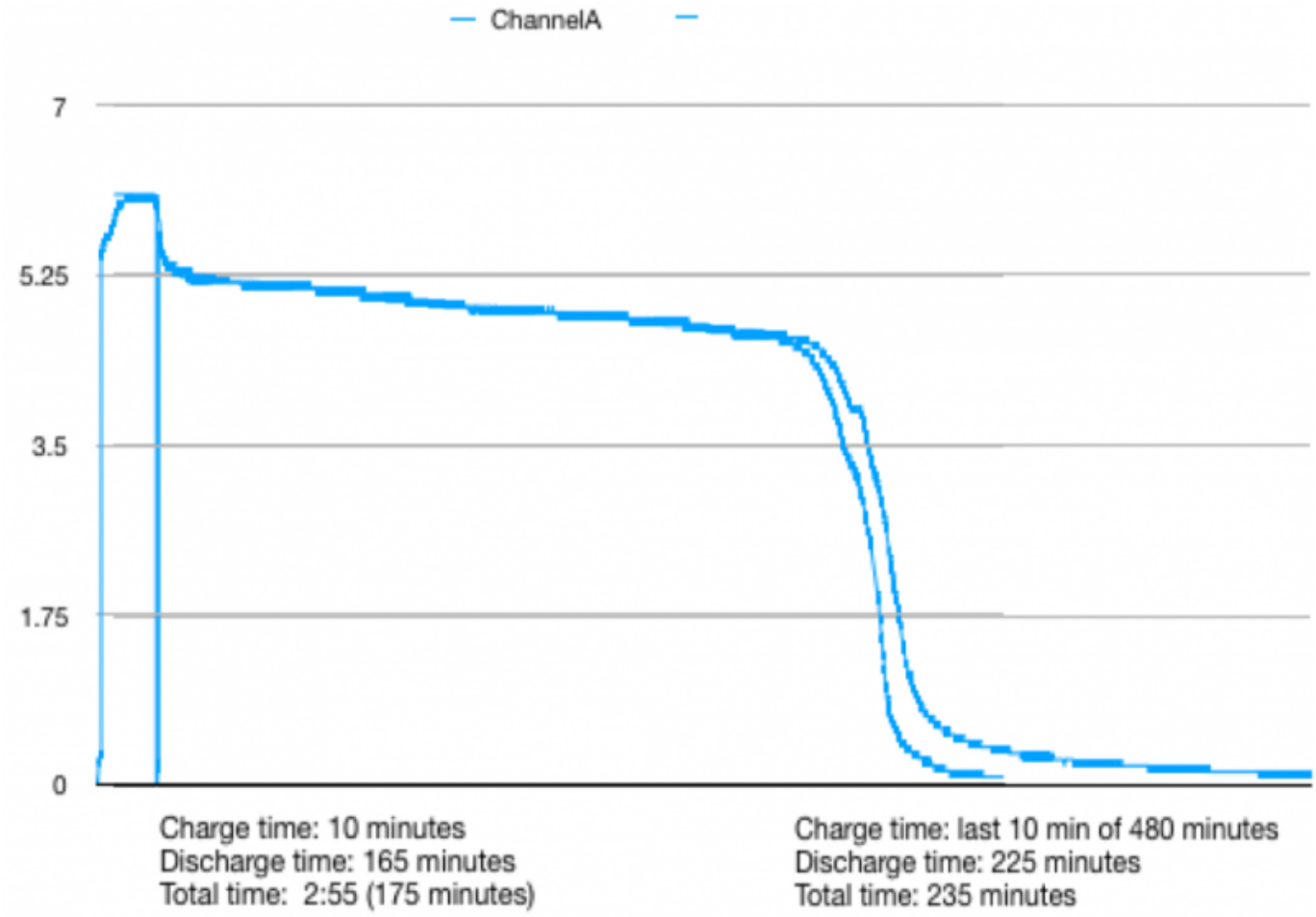
Then I discharged it again to 87.7mV and charged it to 6.07V for 8 hours, followed by another discharge. Here is the full run:



And just the final third:



Superimposing the 10 minute charge and 8 hour charge discharge profiles:



I'll note that the 10 minute charge of the BC3 cell had the max and median values on the scope reading at 6.07V, but the minimum still read 6.01V so it may not have been fully charged (it may have still been pulling some amps), while the 8 hr charge read 6.07V for the minimum as well, so that might account for the discrepancy at the end of the discharge curves.

I can do another charge, say 20 minutes, and see if that accounts for the longer discharge time shown after the 8 hr charge.

However, the differences are relatively minor compared to the charge times as shown, so I think this is a good argument against the chemical changes being a cause of the voltage rebounds, and thus shows the blue cells are not typical capacitors. More like MAGN-acitors??

2 ^ v • Reply • Share ›

Mark ➔ **gdaigle** • 2 years ago

Good job, Greg! It sounds like your friend was reaching...

Anyway, you said that you think that this is: "More likely just a clever use of existing physics..." I didn't think that this was possible with existing physics. Do you have a theory of how this is happening? If so, is this something that you might be able to replicate? I remember floating the idea, a while back, about trying to mimic this behavior with a more "normal" electret. Do you think that that would be possible?

^ v • Reply • Share ›

gdaigle ➚ Mark • 2 years ago

I don't think so, considering it is something in the composition of the Steorn electret that makes it special. If you recall, electrets have a semi-permanent electric charge and though similar to capacitors require that their dielectric be formed within a high voltage charge creating a strong electric field. Sometimes a particle accelerator is used. Steorn may have used something like a strong magnetic field instead. But unlike a bulk magnet formed within a high Telsa field, their films are very thin but work like a magnet and it is the tendency of the domains (once properly biased) to realign themselves and in doing so recover the electrical properties of the device.

1 ^ | v • Reply • Share ›

gdaigle • 2 years ago

I've always been intrigued that years ago Steorn said that they had given up on using their cells to power electric vehicles, saying that the demands were too high on power. During Frank's tests over a year ago the potential of blue cells were rated at about 2000 joules, which would be 0.55 Wh. Though my tests showed a slightly higher potential, I think that's a good conservative value to go with until I can better understanding how to recharge these cells.

Tesla Model S and X used Panasonic "18650" cells with dimensions of 1.8 cm dia x 6.5 cm tall. The new Tesla 3 reportedly will use 4416 of the "2170" cells which are rated at 4.65Ah/cell and 3.6V. That would work out to 74kWh, but some say that improved efficiency could bring that up to a maximum of 104kWh. Call 90kWh as the median power to shoot for. The volume of each 2170 cell is 2.1 cm x 7.0 cm or 30.87 cm^3 each. Times 4416 would work out to 136,322 cm^3 or a volume about half a meter on a side.

You would have to have about 163,636 Orbo blue cells to produce the equivalent power. Clearly that would be a tougher thing to manufacture. The volume of each cell is about 6.5 cm^3 so 163,636 cells would occupy over a million cm^3. That would work out to just over a cubic meter in volume, which would be 7 times the volume of the 2170s for Tesla 3.

So if you have a sporty car, that might be a limiting issue. If you have a vehicle with no opportunity to recharge itself such as a research submarine, vehicle for long term remote operation in low light environments, etc. then it might be worth the extra volume.

1 ^ | v • Reply • Share ›

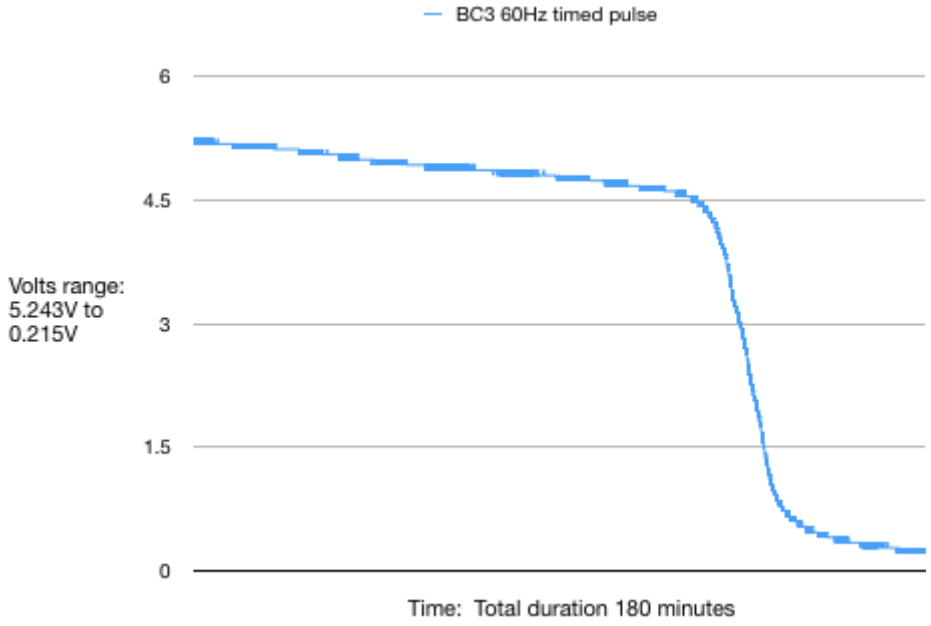
Frank Acland ECW Admin ➚ gdaigle • 2 years ago

Keep in mind, Greg, that as far as I know these cell are the first generation of this technology. Probably not as optimized as this technology could possibly get. However now Steorn is defunct , development may be hampered.

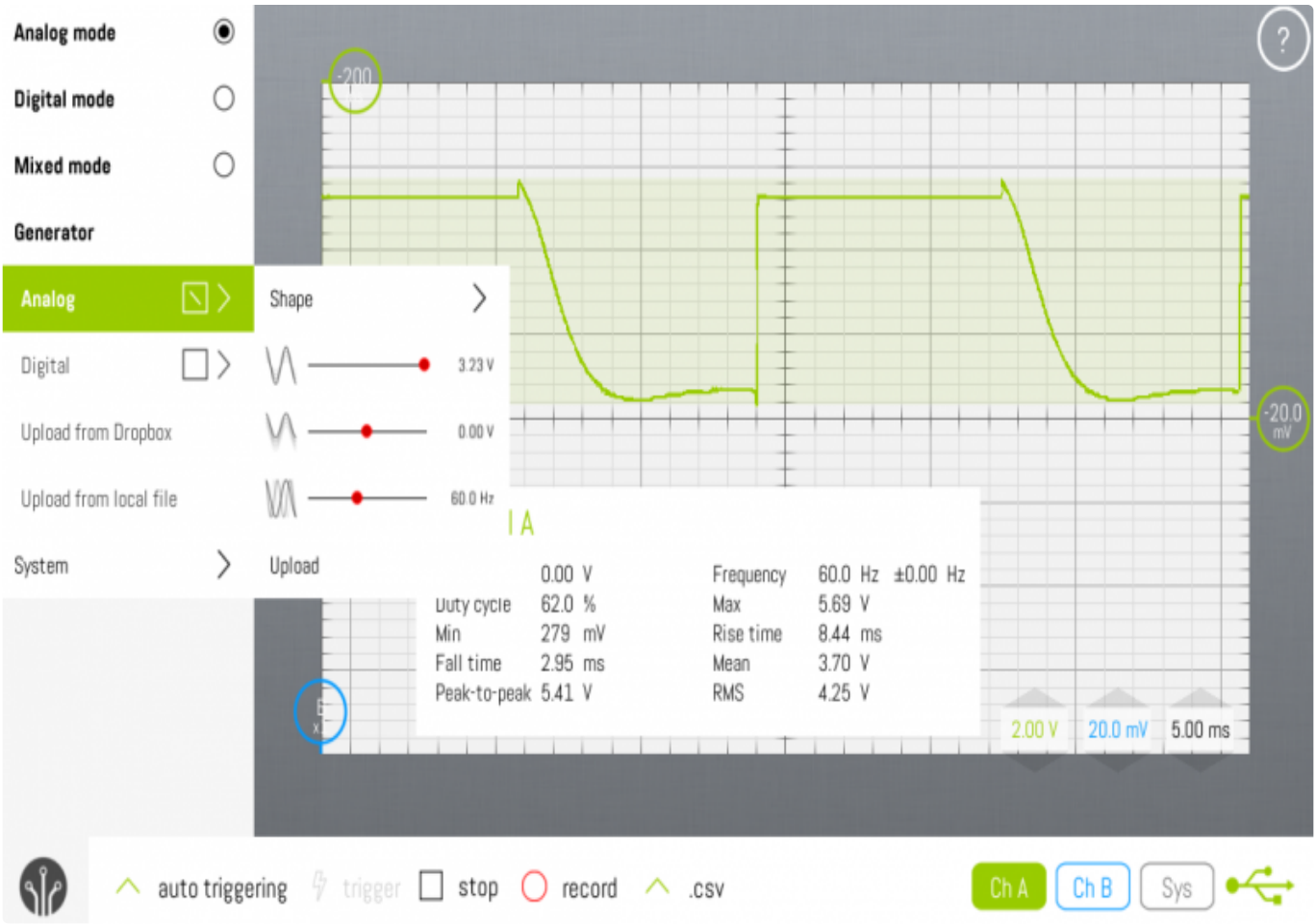
1 ^ | v • Reply • Share ›

gdaigle • 2 years ago

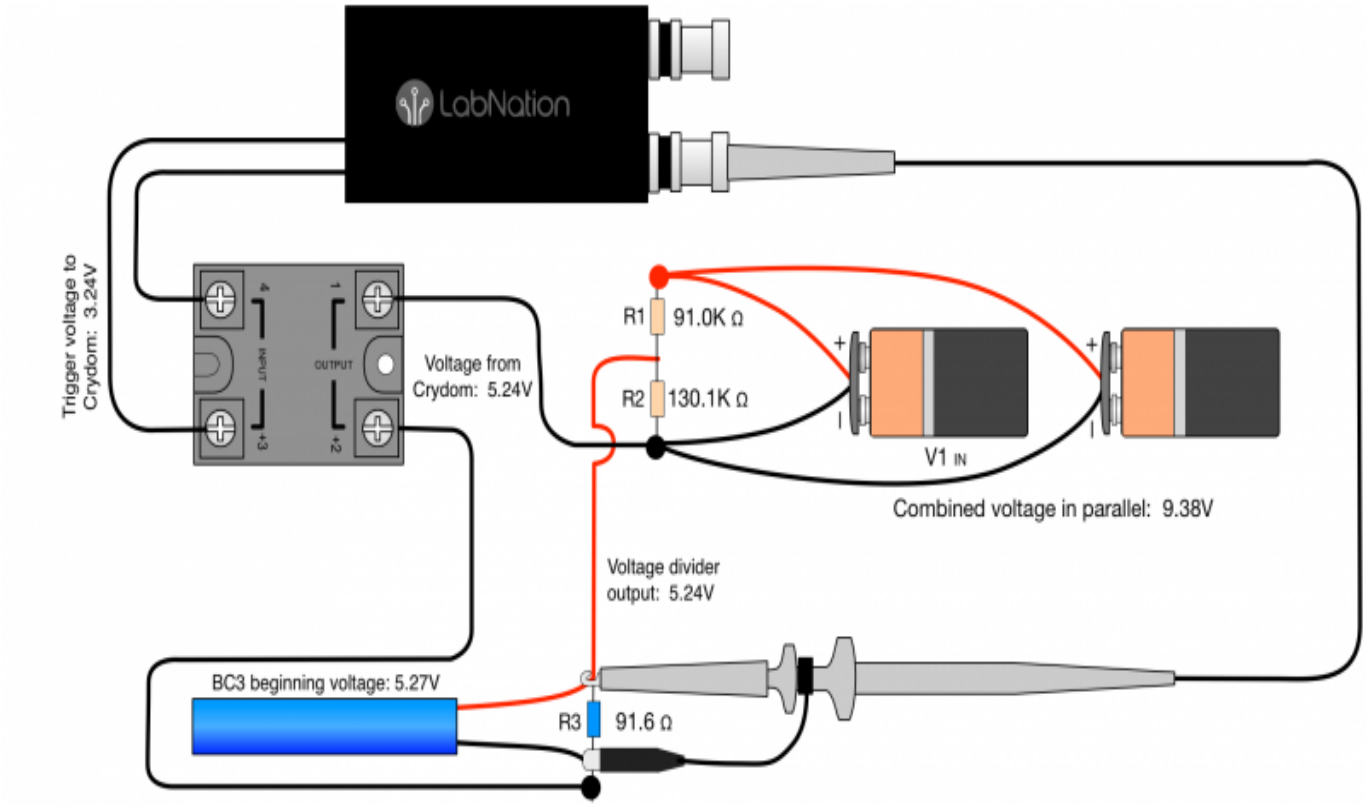
Here is the first attempt of the voltage divider circuit pulse charging the BC3 cell using a Crydom SSR and a 91.0 ohm resistor as the load. The pulse was set to 60Hz.



The voltage starts a little higher than the first time I did this after a straight 100 ohm discharge. Here is the scope trace of the 60Hz pulse using a square wave:



Finally, here is a non-schematic layout of the components:



It does not appear to be recharging the BC3 cell. However, afterwards the 9V batteries do not appear to have diminished (I never expected the BC3 cell to recharge them (because they can not be recharged), but I'd like to know if there are suggestions as to what other pulse configurations I might use to postpone the sharp decline in the cell.

In other words, what settings would allow the BC3 cell sufficient time to recharge itself? I can't remember from Franks old tests if there was a timing recommended by Shaun.

1 ^ | v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Maybe there is some new physics at work, here. Maybe it really is charging the batteries. I remember watching a chat between the HopeGirl crew and Peter Lindemann, and Lindemann was talking about how, one time, he hooked up a regular battery to a different free energy machine and the battery started acting in weird ways that they didn't think were possible for the battery to act.

1 ^ | v • Reply • Share ›

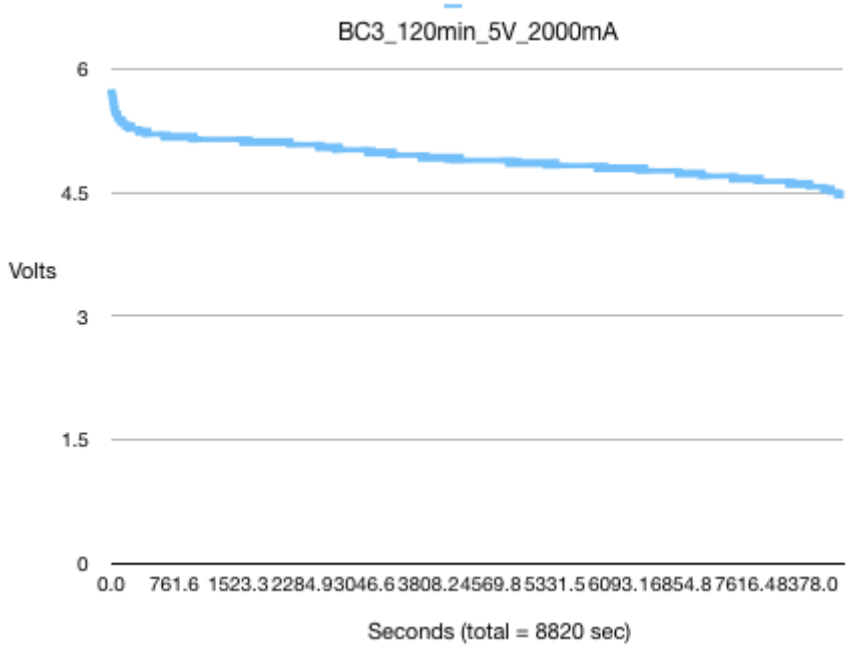
gdaigle ➚ **Mark** • 2 years ago

More likely just a clever use of existing physics, in my opinion.

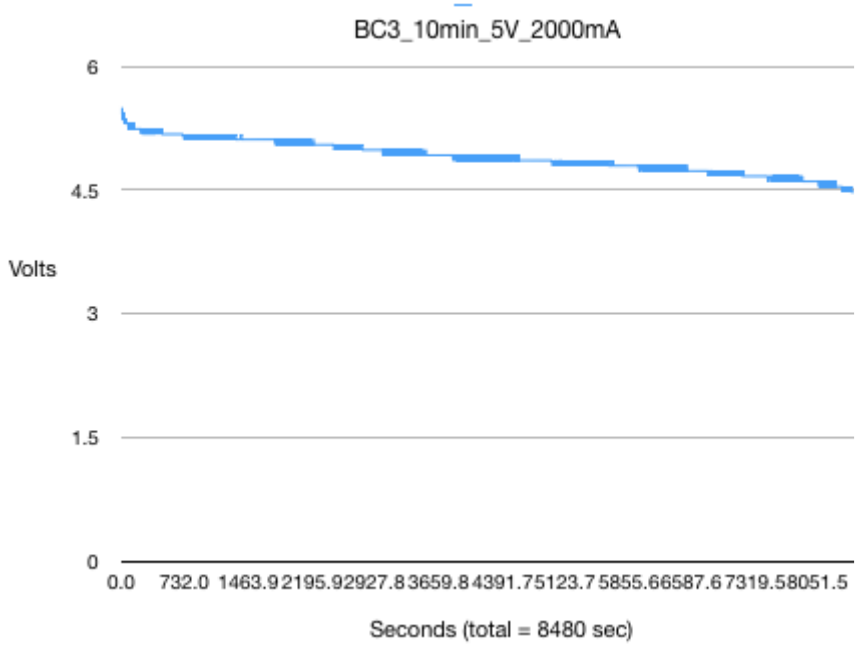
2 ^ | v • Reply • Share ›

gdaigle • 2 years ago

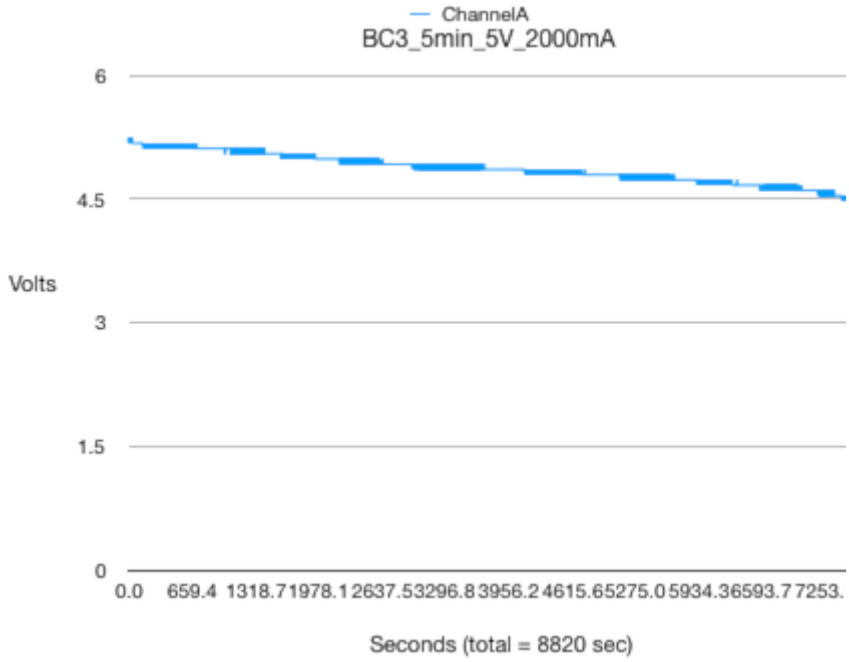
Here are the results of charging BC3 for 2 hours at 5.9V 2000mA, then discharging it with the 100 ohm resistor in parallel. Beginning voltage was 5.75V. Total time to reach 4.5V was 8820 seconds:



I then recharged the cell for only 10 minutes, and got this curve. Beginning voltage was 5.43V. Total time to reach 4.5V was 8480 seconds:



Finally, I then recharged the cell for only 5 minutes, and got this curve. Beginning voltage was 5.24V. Total time to reach 4.5V was 7530 seconds:



(total seconds in image should read 7530)

Each successive recharge is slightly less than the previous one, but I did not expect a 5 minute recharge to last a full 7530 seconds (125.5 minutes) before hitting 4.5V. I believe it is a result of the biasing to over 5V that this can occur. It is not a proof that the O-Cube can recharge itself yet it is unexpected.

A more substantial test in that direction would be to use the voltage division circuit to recharge the cell with the two 9V cells in parallel, if not with straight 5 minute charges then with charging pulses as described previously using the Crydom. That will be the next round of tests.

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SG ➚ **gdaigle** • 2 years ago

So the power discharge ranges from about 0.33 Watts at first, which then dwindles to about 0.2025 Watts. Over the course of 8820 seconds, roughly 2348 Joules or 0.652 Watt-Hours of energy was dissipated through the 100 Ohm resistor.

By way of comparison, a single AA battery can hold and discharge about 4.2 Watt-Hours of energy.

A typical iphone battery can store about 30,000 Joules of energy. So about 12 Orbo cells fully charged would be needed to charge a typical iphone battery. It seems 8 Orbo cells per monkey head might not have been enough. Then again, perhaps letting the orbo cell discharge all the way to near 0 might provide the total energy needed to charge an iphone battery.

We're still left with the mystery of how the things get charged all the way up in the first place.

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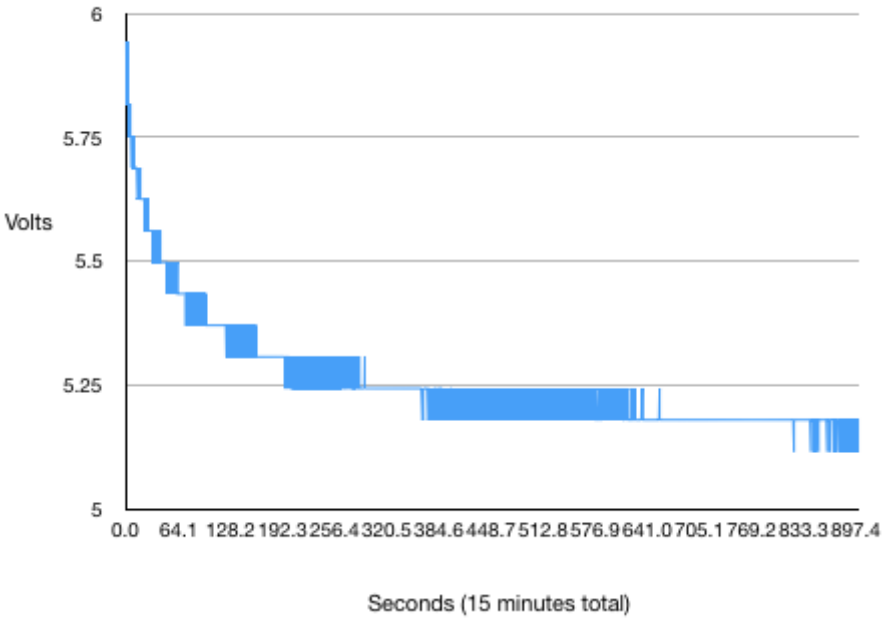
gdaigle • 2 years ago

I have some new data that is most interesting.

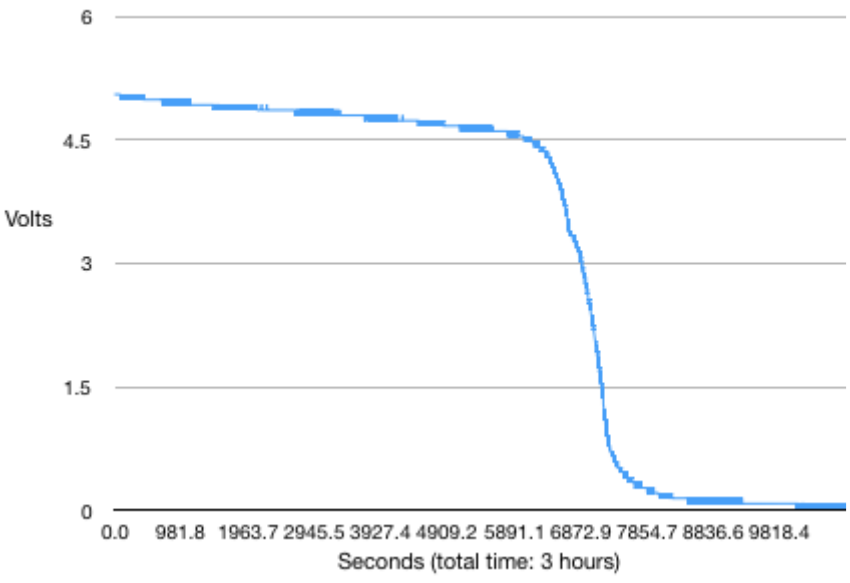
Take a cell and place a 100 ohm resistor across it to discharge it, measuring the voltage with respect to time That will give two things:
1. The amount of energy in the cell when 'fully' charged (circa 900-1000 joules per small cell)
2. The shape of the discharge curve.

I did so, first charging BC3 with a 5.9V 2000mA DC charger since the voltage divider circuit that was pushing out 4.9V didn't move the voltage in BC3 above 3.74V after 19 hours. So I used the DC power source, charging BC3 for one hour.

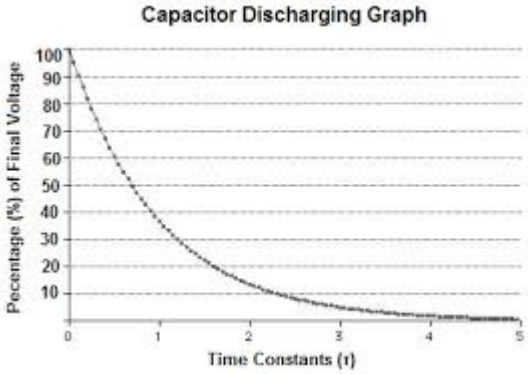
The cell began at 5.94V and expected the voltage to drop quickly like it did with the 50 ohm resistor across the leads — but though it did initially drop quickly, it very soon plateaued and I realized that my recording length for those settings (about 20 minutes) was not going to capture the entire discharge. So I let it drop to 5.18V and then once it reached just above 5.0V I recorded again using a setting that would allow me to record for 4 hours. Here is the 5.94V to 5.18V result:



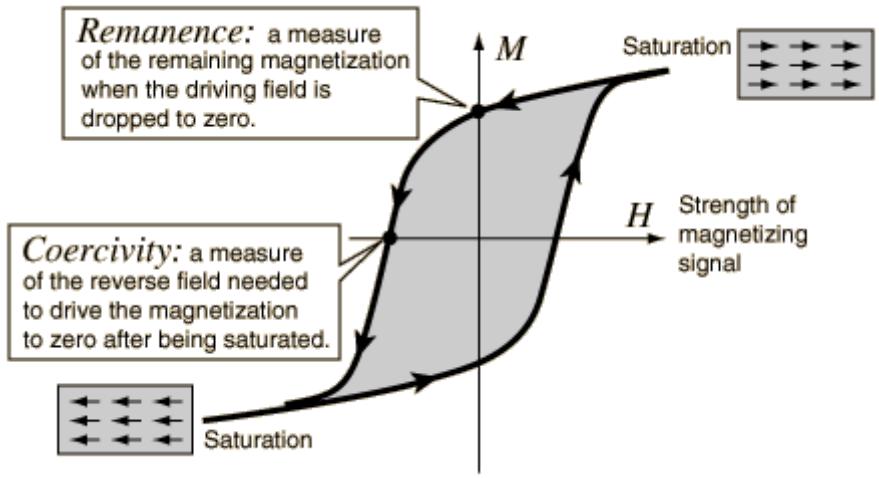
And the result beginning at 5.05V for three hours:



Note that the discharge curve is not a capacitor discharge curve, which typically looks like this:



It looks more like the plateauing of a hysteresis curve of a magnet, such as this standard curve of a magnet going from saturation toward remanence and down through coercivity toward the opposite saturation:



In this case it is the energy of the system that is diminishing. It is the curve of the energy in a domain structure being drained. In such a case you see two relatively flat sections to the curve. These represent distinct states defined by the level of domain alignment, which displays different behavior in these different states.

It may be that measuring the capacitance of the unit vs energy stored and you will see a many order of magnitude disconnect. However, I'm unable to measure that directly with my instruments.

Just playing around, the first part of the curve beginning at 5.05V took 101 minutes to drop to 4.5V. I can't say that recharging from the O-Cube batteries would have taken place as it neared the end of this flat section to maintain its high bias voltage, but the results are certainly of a much higher power curve than when I charged the cells only to 2.77V, which would have been in the middle of the sharp downward slope of the curve seen today. That is likely why the voltage dropped so quickly in my previous tests — I had not yet reached the voltage corresponding to that important plateau.

Here is some speculation:
Let's take the lowest reading before the curve really dropped. That would be about 4.5V, which was reached from the 5.0V beginning mark. Using that and the 100 ohm resistor in the DC power calculator (http://www.rapidtables.com/... gives 0.2025 Watts, and in the watts to joules calculator (http://www.rapidtables.com/... that yields 1227.15J for this single cell over 101 minutes (6060 seconds).

CWatters had previously mentioned that to charge a single 2000mA 3V phone battery takes about 21,600 Joules. That would be 2700 Joules per each of the eight cells, or, about 0.0313 Watts per 24 hours (1 day). Charging 2 phones would take roughly twice that.

The 1227.15 Joules calculated from my test of a single cell is less than half of what a single cell would need to contribute to recharging a single cell phone by 8 cells. However, it provided that power in less than 2 hours.

If the Li-ion cells of the O-Cube were to recharge the blue cells (biased at about 5V) half a dozen times per day before they start the steep decline, it could maintain sufficient power to recharge two phones.

(6 recharges) X (8 cells) X (1227 Joules) = 58896 Joules.

That would be above what would be needed to recharge 2 cell phones in a 24 hour period AND may give time for the blue cells to recover during that period.

CONCLUSION: The possible power output of the O-Cube might yet work.

2 ^ v • Reply • Share ›

Mark → gdaigle • 2 years ago

I don't think that we should get too bogged down in whether or not the cells perform well enough to charge the devices. Even if they don't, this is still some interesting behavior that should be examined further.

2 ^ v • Reply • Share ›

SG → gdaigle • 2 years ago

This confirms much of what we saw during our initial testing with Frank. We noticed the unique discharge curve, just as you have. We noticed that the capacitance seemed to *increase* as more charge was added to the Orbo cells, which seemed strange. We noticed the precipitous drop in charge once a certain threshold was met.

With all of that determined, how can one prove it? In other words, does the Orbo cell self-recharge on the "left" side of the curve, or does it require a DC charger. If it requires a DC charger, doesn't that defeat the purpose of a self-recharging system?

Edit: I'm back to thinking that a pulsed discharge configuration centered near the voltage at which the Orbo cell self-recharges is what is needed. Each periodic discharge will be small energy-wise, but over time, could eventually charge a separate Orbo cell up to the "left" side of the curve. Does that make sense?

1 ^ v • Reply • Share ›

gdaigle → SG • 2 years ago

I think it does make sense. I'm going to recharge BC3 and first discharge it with the 100 ohm resistor down to the bottom of the first plateau (about 4.5V). Then I'll recharge it again for a short period of time (5-10 minutes) and repeat the discharge.

I'll see how this works over 4 recharges with the DC charger. If the discharge profile stays the same over the 4 hours then I'll try the same with the voltage divider circuit using two 9V batteries at 1250mA. That would be closer to the use of O-Cube's internal batteries. I want to see if just a short recharging will result in a 100 minutes or more duration for that first plateau for each subsequent recharge.

I would also like to see what happens to the domains of just a half cell once it is completely depleted. Are they compromised?

1 ^ | v • Reply • Share ›

Mark ➚ **SG** • 2 years ago

Interesting idea...didn't Shaun once say something about the possibility of making an OCube, in the future, that would have only Orbo Power Pack cells that would recharge each other?

^ | v • Reply • Share ›

SG ➚ **Mark** • 2 years ago

Yes, that is my memory as well--one orbo cell charges another. I always wondered why it would be done that way, but maybe we are closing in on the reason. Shaun also showed us the oscilloscope trace on a live feed for several weeks, where an orbo cell was being periodically discharged in a square-wave-like pattern. My guess is each discharge is tiny in terms of energy, but over time, maybe you can charge up another cell with those discharges.

1 ^ | v • Reply • Share ›

CWatters • 2 years ago

I think it's time to stop. It's clear the cells are performing at least 4 or 5 orders of magnitude below the level required to match Steorn claims. The cells have either failed or Steorns claims were bogus so there is nothing really to be gained by continuing.

^ | v • Reply • Share ›

gdaigle ➚ **CWatters** • 2 years ago

Actually, I have other variations to explore from Franks earlier tests suggested by Shaun. I'm out of town now, but will be performing additional tests when I return early in the week.

^ | v • Reply • Share ›

CWatters ➚ **gdaigle** • 2 years ago

Perhaps ask him to send you a working cell. That might be worth testing but not a faulty one.

^ | v • Reply • Share ›

Mark ➚ **CWatters** • 2 years ago

Who cares if it is 500 bazillion times lower? Greg is trying to figure out how all of this works, which is what pure researchers are interested in, regardless of any practical value. Why would you want him to stop doing that?

1 · Reply · Share ›

CWatters ➚ **Mark** • 2 years ago

Because i honestly believe there are more productive things he could be doing or researching.

· Reply · Share ›

Mark ➚ **CWatters** • 2 years ago

Then you have issues. If you think that there are other things that would be better to research, then go research them, yourself. Don't try to tell Greg what to do.

· Reply · Share ›

gdaigle ➚ **Mark** • 2 years ago

Guys. Please. Chill. I'm good with the tests already done and to be done. Really.

· Reply · Share ›

gdaigle • 2 years ago

Well, the measurement of the cell BC3 with a 50 ohm resistor connected in parallel was interesting. In short, the voltage of the cell dropped like a rock.

Starting voltage of BC3: 2.6637V after 18 hours biasing.

50 ohm resistor in parallel results:
Fumbled a bit to connect them, but by the time the scope was running (less than 10 seconds) the voltage was down to 0.3250V, quickly going down to near 0V after 10 seconds.

After disconnecting, the cell had a voltage rebound back to 2.22V within a couple of minutes.

Tried again after a few minutes to be confident of this decline.
Results: voltage dropped from 0.0722V to near zero.

This time when the voltage rebounded after disconnecting, it was 1.67V

So, 50 ohm is way out of range and drops the voltage severely. It was hoped that use of a 50 ohm resistor in parallel would maintain a constant voltage, because use of a resistor in the 50K ohm range would suggest that the power output of the cell was 1/1000th of the power at 50 ohm. This suggests strongly that the power output is well below that advertised by Steorn.

It could be that BC3 is acting differently from the other cells, though its history of retaining a moderately high voltage (i.e. 1.46V) for a period of time suggests it operates normally.

BC1 had previously sustained voltage with a 100K ohm resistor in parallel and dropped when the resistor in parallel was 30.5K ohm. Additional test will be required to determine the lowest resistance at which the voltage sustains for BC3. As mentioned previously, I have additional resistors in the 40K to 100K range (and now, resistors between 100K and 500K) to do that.

Right now, it isn't looking good for Steorn unless there is something in the measurement procedures that I have missed (completely possible) where a different procedure would result in different outcomes. This might be the time to take a break and share some of the results with Shaun to see if he can shed some light.

1 • Reply • Share ›

SG ➚ **gdaigle** • 2 years ago

First, thank you for your continued efforts. Here are a few thoughts of mine for now:

1.
It is interesting that the cells recharge themselves to some stable voltage point, with or without the bias circuit. Clearly, the bias circuit helps.

2. The power output is low. I guess we have known that now for some time, given Frank's testing with ECW community input over the course of months.

3. Steorn seemed to favor pulsed configurations. As shown on their live stream, they displayed essentially a square wave, stating that it was showing periodic discharges and self-recharges of the Orbo cell. The motor placed on the same table was also being pulsed to run.

4. We (the ECW community) in the past has favored a non-pulsed slow discharge through a relatively high-ohm resistor to ease measuring the power over time, and therefore the total energy from the cell.

5. It might make sense to shift to a pulsed configuration through a relatively low-Ohm resistor. Perhaps your oscilloscope is sophisticated enough to measure the power over time of the periodic waveform (and therefore, the total energy). This would seem to be more consistent with the way Steorn was using the Orbo, and maybe it is the best way to extract energy from the cell.

• Reply • Share ›

gdaigle ➚ **SG** • 2 years ago

Thanks for your input. Regarding your suggestions:

3. Considering how fast the voltage rebound is, I don't know how I would separate what is a rebound and what is the self-recharging of the cell. I did do some scope traces recharging using a Crydom SSR, but not to recharge it.

4. I have done a slow discharge with a 100K and 500K ohm resistor, but unless I have the calculations all wrong on this continuous discharge, the higher the value of the resistor in parallel, the lower the power rating of the cell. I certainly could have that wrong so am open to interpretation on that.

5. My SmartScope comes with 4 dedicated digital output channels, each capable of generating up to 100MS/s with sharp rise and fall times of 2ns. This allows square waves of up to 50MHz to be generated. I could use the Crydom with a relatively low ohm resistor to charge it.

Reply • Share ›

SG ➚ **gdaigle** • 2 years ago

I guess what I had envisioned was a periodic switch that closes (connects) a low-ohm resistor to the Orbo cell for a fraction of time to discharge the cell, then opens (disconnects) the low-ohm resistor from the Orbo for another fraction of time to let the cell self-recharge (perhaps with assistance from the bias circuit). Repeat.

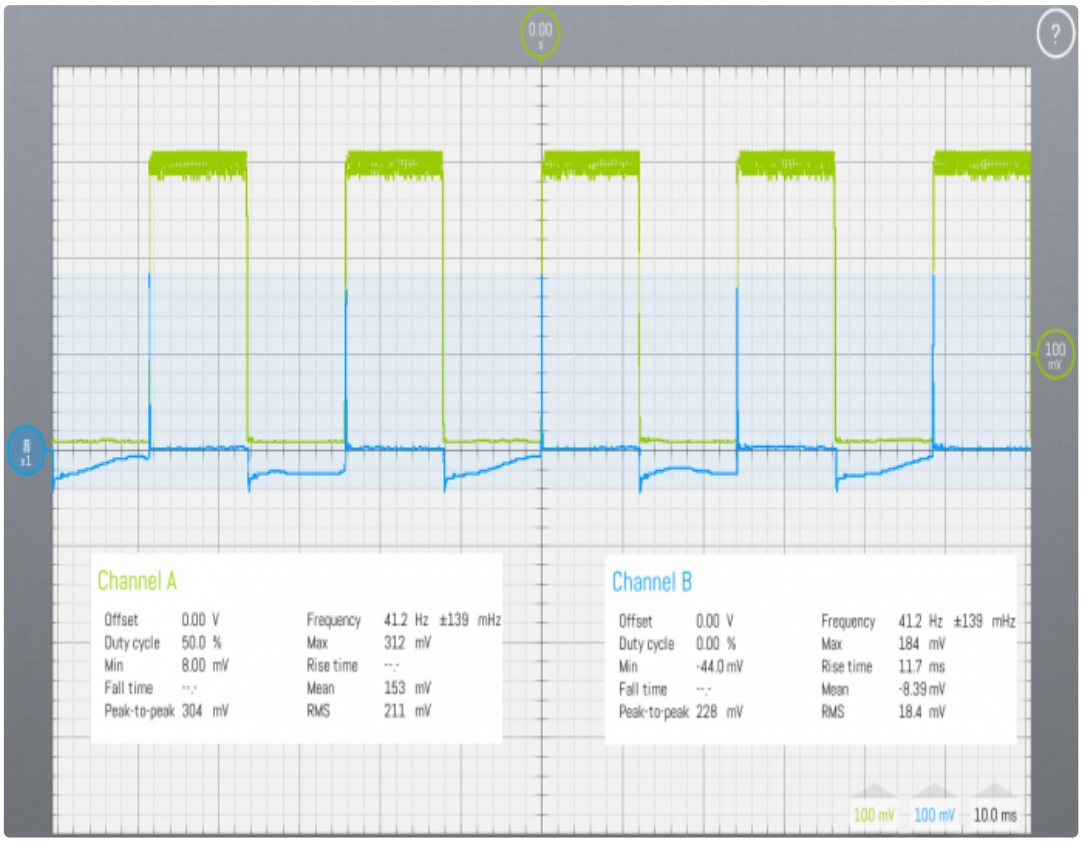
Observe the voltage waveform on your oscilloscope, and hopefully measure the power over time to arrive at some kind of estimate for the energy released by the cell.

I know this is all much easier said than done. for sure. But it would be interesting because it would more or less match what we saw Sean do on the live stream before Steorn went belly up.

Reply • Share ›

gdaigle ➚ **SG** • 2 years ago

Actually, it wouldn't be that bad. I have done tests with my scope triggering a Crydom and it will work, but I've not used it to try and recharge a cell. Here is one grab of such a setup from my scope:



I could use the voltage divider circuit as you mention and test the cell beforehand and afterhand as well as take readings at set intervals during the test. If voltage is maintained even with a low ohm resistor in parallel then it might be a good indication that the power could be retained. I'll have to see if I can find the interval that Shaun used in his tests.

I might have to wait until next week to set this up, but worth testing.

1 ^ v • Reply • Share ›

SG ➚ **gdaigle** • 2 years ago

First, thank you for your continued efforts. Here are a few thoughts of mine for now:

1) It is interesting that the cells recharge themselves to some stable voltage point, with or without the bias circuit. Clearly, the bias circuit helps.
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^ v • Reply • Share ›

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2) The power output is low. I guess we have known that now for some time, given Frank's testing with ECW community input over the course of months.
3) Steorn seemed to favor pulsed configurations. As shown on their live stream, they displayed essentially a square wave, stating that it was showing periodic discharges and self-recharges of the Orbo cell. The motor placed on the same table was also being pulsed to run.
4) We (the ECW community) in the past has favored a non-pulsed slow discharge through a relatively high-ohm resistor to ease measuring the power over time, and therefore the total energy from the cell.
5) It might make sense to shift to a pulsed configuration through a relatively low-Ohm resistor. Perhaps your oscilloscope is sophisticated enough to measure the power over time of the periodic waveform (and therefore, the total energy). This would seem to be more consistent with the way Steorn was using the Orbo, and maybe it is the best way to extract energy from the cell.

Reply • Share ›

Mark ➚ gdaigle • 2 years ago

Now you got me all confused with a statement like this:

"Right now, it isn't looking good for Steorn unless there is something in the measurement procedures that I have missed (completely possible) where a different procedure would result in different outcomes."

I thought you had already said that it, basically, seems to be working the way that the dudes at Steorn said that it would, albeit with less power output than they wanted. It sounded, to me, like you were saying that the issue was the amount of power, and the "quality control." Now, it sounds like you're going back on that. Maybe my inexpertise is showing...well, I hope that you can contact Shaun, and I hope that he is enlightening as to what, exactly, is going on, here.

Reply • Share ›

gdaigle ➚ Mark • 2 years ago

Well, the power calculator I was using has what I consider to be an unclear user interface. It changed my settings automatically and I did not notice it, giving an undeservedly high power rating to the cell when it should have been just a small fraction of that value. Again, I may have it wrong, but hopefully Shaun can clarify.

1 Reply • Share ›

Mark ➚ gdaigle • 2 years ago

While you're at it, ask him if he minds if you send a sample to that lab to see if you can figure out what that "magic material" is made of.

Reply • Share ›

gdaigle ➚ Mark • 2 years ago

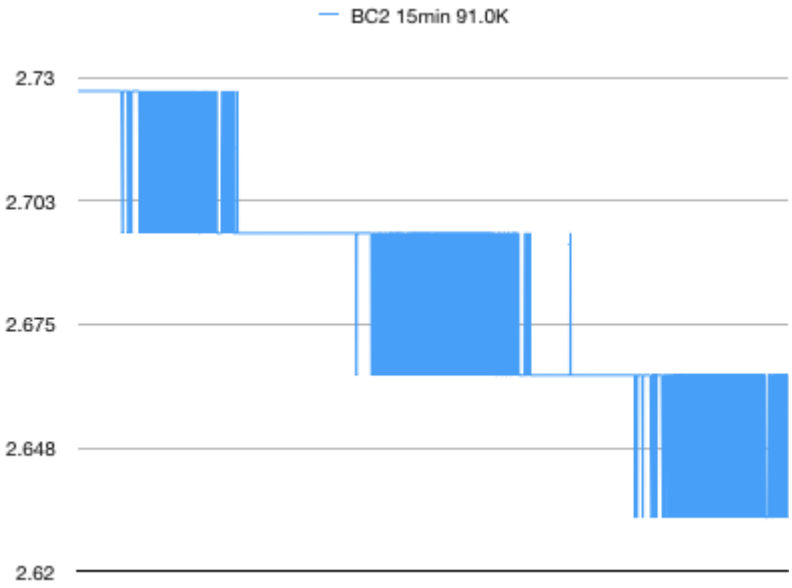
Doesn't hurt to ask. But there is also the question of how he got the material to perform in the way it does. It is built like a capacitor, but Shaun mentioned that the discharge curve is quite different than what you might expect. Still more to learn.

1 Reply • Share ›

gdaigle • 2 years ago

First, I could use input from someone who knows electrical testing, so please feel free to give input.

This latest scope reading changes my thinking a bit. I did a 15 minute test with the resistor rated at 91.0K ohm (actual measurement of 90.9K ohm) in parallel and got a pretty rapid decline in voltage, which is very different than the 2 minute tests I did 10 days ago.



The voltage is constantly dropping, so I can't do a power calculation. However, taking a small section of the graph I discovered a serious error in my past power calculations.

In the past I had been using this calculator for power: http://www.rapidtables.com/...

If I insert the values for V and R the values for I and P are generated automatically. If I insert V and R and do not change the scales, the calculations come out correct. However, I changed the scale from ohm to K ohm after inserting the R value 50. Doing so the calculator automatically changed the inserted value to 5000 but I did not notice, throwing off my calculations enormously. I reported a calculated power value of 0.031752W, when it should have been 0.000031752W. As resistance goes down, power and current go up in the calculation

So now I am at an impasse, since at 91.0K the result would be just a few joules, not 2,743J. I need input from this forum.

I could continue with these longer tests with resistors in parallel but have this question: Should I be testing with higher ohm resistors, or much lower ohm resistors? I have previously performed 10 minute tests with 500K and 100K ohm resistors and the voltage was unchanged until the 30.5K resistor was used. But was that sustaining of V just an artifact of the 2 minute testing timeframe. Should I instead use something like a 50 ohm resistor?

Any input would be appreciated.

Reply • Share ›

Frank Acland ECW Admin ➚ gdaigle • 2 years ago

I would go with higher Ohm resistors, just because there's more time to watch the behavior of the cells.

BTW, I don't think you will often get the same reading twice from the cells. In my experience the more exercise they get, the weaker they get and the faster they drain. The longer you let them recharge, the slower they discharge.

Reply • Share ›

gdaigle ➚ **Frank Acland** • **2 years ago**

That would be consistent with the comments from Andreas Moraitis, but I'm going to go back to the original recommendation of CWatters, though the resistor I have closest to 50 ohm is 13.3 ohm. Will try that until I can get access to additional resistors in the lower range. If I were to go to higher ohms it could work, but the resultant power calculation from a 100K+ ohm resistor means that the O-Cube could take years to charge a cell phone. I'm not saying that isn't the case :-), but would favor going for the lower ohm resistor as that is the range where the O-Cube could work as advertised.

Your comments about the duration of recharging is consistent with my results here.

Darn, I just shorted the cell. Going to give it another hour to recharge in the bias circuit before trying again.

^ | v • **Reply** • **Share** ›

gdaigle ➚ **gdaigle** • **2 years ago**

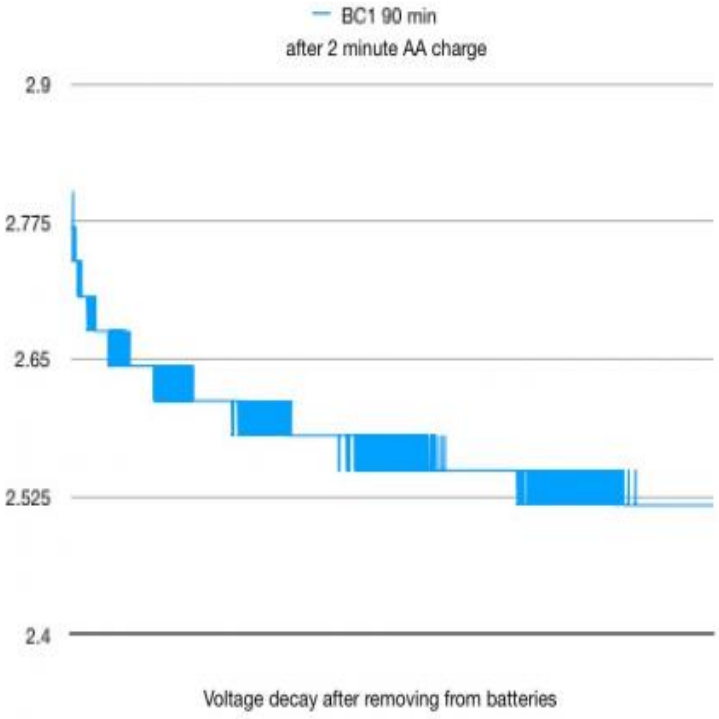
My 13.3 ohm resistor was a tubular wire wound one, and for some reason my scope doesn't like it, giving me only a couple of seconds of readings over 10 minutes. By the time I figured that out my voltage was down to 0.0090V. So rather than waiting for it to recover I'm going to recharge the BC3 cell in the biasing circuit and work with that one.

Will come back to this tomorrow after I have new ceramic resistors in hand, 20ohm to 100ohm. Not sure if the rapid discharge was due to the low ohms or just something about that wire wound resistor.

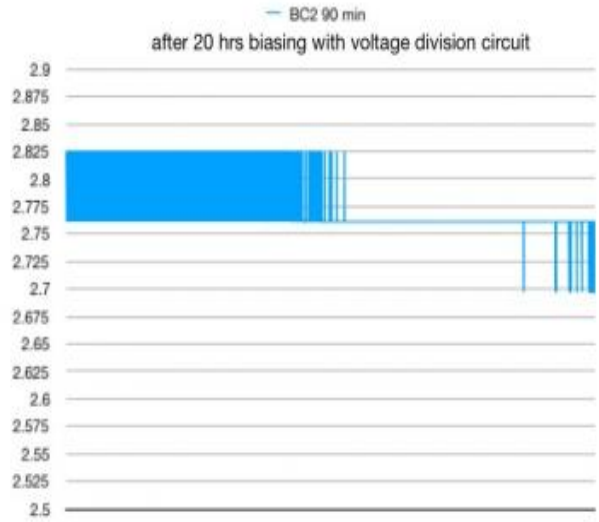
^ | v • **Reply** • **Share** ›

gdaigle • **2 years ago**

Here is a comparison of two 90 minutes tracings. On the left is the older tracing of BC1 after a 2 minute charge with two AA batteries rated at 2.77V. On the right (adjusted to a comparable scale) is BC2 after 20 hrs charged with the voltage division circuit to develop a more enduring bias.



Voltage decay after removing from batteries



Voltage decay after removing from voltage division circuit

It is clear that BC2 is dropping in voltage much more slowly than BC1. The steps are larger because the scope automatically snapped to a different V/div setting giving a wider range in voltages per division, but the slower drop for BC2 is clear. Lowest reading for BC2 was 2.6973V.

I'm going to now take BC2 at the current setting and do 10 minute readings with resistors in parallel starting at 91.K ohm to see if I can get a more accurate power setting.

Reply • Share ›

gdaigle • 2 years ago

Update late 7-16-17 10:04 pm

After a full 10 hrs and while attached to the bias circuit: 2.6974V
After a full 10 hrs and detached from the bias circuit: 2.6974V
Reattached BC2 to the bias circuit to see if the voltage ever reaches 2.837V originally measured in the circuit by my scope.

Tomorrow I will begin again with the resistors in parallel to see more specifically when the voltage begins to drop.
I have new resistors to test between the values of 30.5K ohm and 100K ohm:
33.2K ohm
40.2K ohm
47.5K ohm
51.1K ohm
60.4K ohm
69.8K ohm
80.8K ohm
90.9K ohm
Starting with 90.9K I will measure each for 10 minutes before going on to the next. If readings do drop, then I will be able to calculate a more accurately the power reading. When it does drop, I will

detach the resistor and continue to read the cell to see how fast the new biasing allows it to regain its original voltage.

Regarding the other cells:
After another 24 hours here are the results for BC1, BC4, FC1 and BC3:
BC1: 1.5783V (down from 1.7120V, continuing the fall from its 2.77V recharge value)
BC4: 0.2971V (down sharply from 0.4591V. Not sure why. Discontinuing discharge readings for this cell)
FC1: 0.3958V average (close to 0.3933V. I'm going to call this as having reached the stable point. Discontinuing discharge readings for this cell)
BC3: 1.4605V (No change from 1.4605V (no change from 1.4605V. This cell has reached it balance point. Discontinuing discharge readings for this cell)

So in summary, I am taking FC1, BC3 and BC4 out of the measurement rotation because either of an accidental discharge or them having reached a stable point after self-recharging.

FC1 has been measured for 371 hrs, or about 15.5 days and 3 days ago it was oscillating around its stable value.
BC3 has been measured for 371 hrs, or about 15.5 days and 2 days ago it was oscillating around its stable value.

This confirms that they all can reach different stable points in their self-recharging. The cause I suspect is different biases established before the tests began.

Eventually I hope to recharge all of these cells in the bias circuit to see if they all perform similarly.
2 ^ v • Reply • Share ›

SG → **gdaigle** • 2 years ago

I like and appreciate your methodical approach. It is quite interesting to me that nearly everyone in the world (who was aware of it at one point) has written off the Orbo. I never was satisfied that there was nothing there.

We (the ECW community) scrutinized it like crazy to the best of our ability without access to the innards, and never really could pin it down in terms of making any kind of solid conclusion.

With your work, and with access to the innards now, I think much can be learned. It ain't over until its over. And it might not ever be over, depending on what you find.
1 ^ v • Reply • Share ›

Frank Acland ECW Admin → **SG** • 2 years ago

I agree, SG. I'm really impressed that Greg has taken so much time and trouble to test and report in great detail. For years there was no real way for outsiders to evaluate the bold claims of Steorn. Clearly their business model didn't work, but a failed business doesn't necessarily mean the tech was a scam. At least now we have data to examine to give us a clearer picture about their claims.
1 ^ v • Reply • Share ›

gdaigle → **Frank Acland** • 2 years ago

Yes, being laid off recently doesn't have many pluses, but this was one way to fill the time.

2 ^ v • Reply • Share ›

CWatters ➚ **gdaigle** • 2 years ago

Sorry to hear that. Please don't waste to much time testing this junk!

^ v • Reply • Share ›

gdaigle • 2 years ago

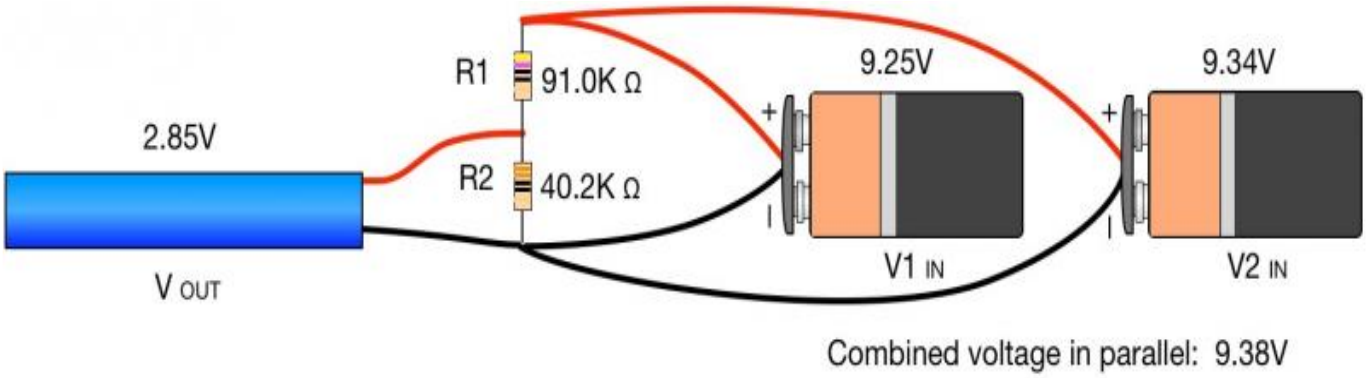
Update: BC2 after 1 hr: 2.0632V. Next reading in 9 hours.

^ v • Reply • Share ›

gdaigle • 2 years ago

Update 7-16-17

Biasing of cell BC2 has begun.
Here is the circuit with new values:



Beginning with (VOUT)(R1)/(VIN - VOUT) = R2 and looking for a VOUT of about 2.7V

(VOUT)(R1)/(VIN - VOUT) = R2, is equivalent to: (VIN)/((R2/R1)+1) = VOUT

Using closest resistors available: 9.38V/(91.0K Ω/40.2K Ω)+1), or, 9.38V/(2.264)+1) = 2.87V

Multimeter readings from built circuit = 2.85V
Average scope readings from built circuit = 2.837

BC2 reading just before bias: 0.5141V. No change in 12 hrs.
BC2 after a quick 10 seconds charge from the bias circuit: 0.54837V
BC2 after a second quick 10 second charge from the bias circuit: 0.5847V
Amperage of the circuit is less than that of the previous quick charges by two AA batteries, so I expect that is why it didn't immediate spike closer to 2.85V.

Full charge began at 11:50 am. Will give update in 1hr and 10 hrs.

^ v • Reply • Share ›

gdaigle • 2 years ago

After another 24 hours:

BC1: 1.7120V (down from 1.8306V, continuing the fall from its 2.77V recharge value)

BC4: 0.4591V (up from 0.4489V, continuing the rise from its resistor discharge)

FC1: 0.3933V (up from 0.3882V, may not yet have reached stable point above its 0.3206V origin but is is close)
BC3: 1.4605V (no change from 1.4605V, no change toward its 1.6160V origin). This cell has reached it balance point (no discharge, no self-recharge).

BC2: 0.5140769 (at the bottom range of the previous reading of 0.5032V). Very close to its balance point (no discharge, no self-recharge).

Also, I built the voltage divider circuit, but the voltage was coming in too high (around 5.56V) so I changed the resistors. It is the ratio of one resistor to the other that really matters. These are the resistors finally employed:

+ 91.0K ohm reading (rated at 90.9K ohm)
- 40.2K ohm reading (rated at 40.2K ohm)

V1: 9.25V
V2: 9.34V
Combined voltage in parallel: 9.38

V out: 2.85

I will start the biasing tomorrow.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

I have mentioned previously that 9V cells were used in the O-Cube, but Shaun said it should have been rechargeable Li-ion batteries. As recalled by Frank, Shaun originally said they mistakenly sent him the wrong version of the O-Cube, because it had capacitors in it instead of the Li-ion batteries that they were supposed to have. The purpose of the Capacitors/Li-ion batteries was to act as an energy storage mechanism so there was a smooth source of power to deliver to the USB port. Also, at the time there were apparently safety issues with shipping Li-Ion batteries.

I had noticed a purple package of components near the USB port during the tear-down. I went back to the O-Cube and pealed back the film covering to find two 2.5V 10F super capacitors.

The reference to 2.5V 10F is not shown but can be seen on the backside of the caps. I believe this is the manufacturer: COOPER BUSSMANN Powerstor HB1030-2R5106-R HB 10F 2.5V super capacitor.

Specs are very similar to:
http://www.mouser.com/Produ...

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

Late in day: 10pm, 13 hrs after last reading:

BC1: 1.8306V (down from 1.8736V, continuing the fall from its 2.77V recharge value)

BC4: 0.4489V (up from 0.4388V, continuing the rise from its resistor discharge)

FC1: 0.3882V (back again to 0.3882V, may be oscillating within a small range above its 0.3206V origin)
BC3: 1.4605V (no change from 1.4605V, may have plateaued and stopped rise toward its 1.6160V origin)

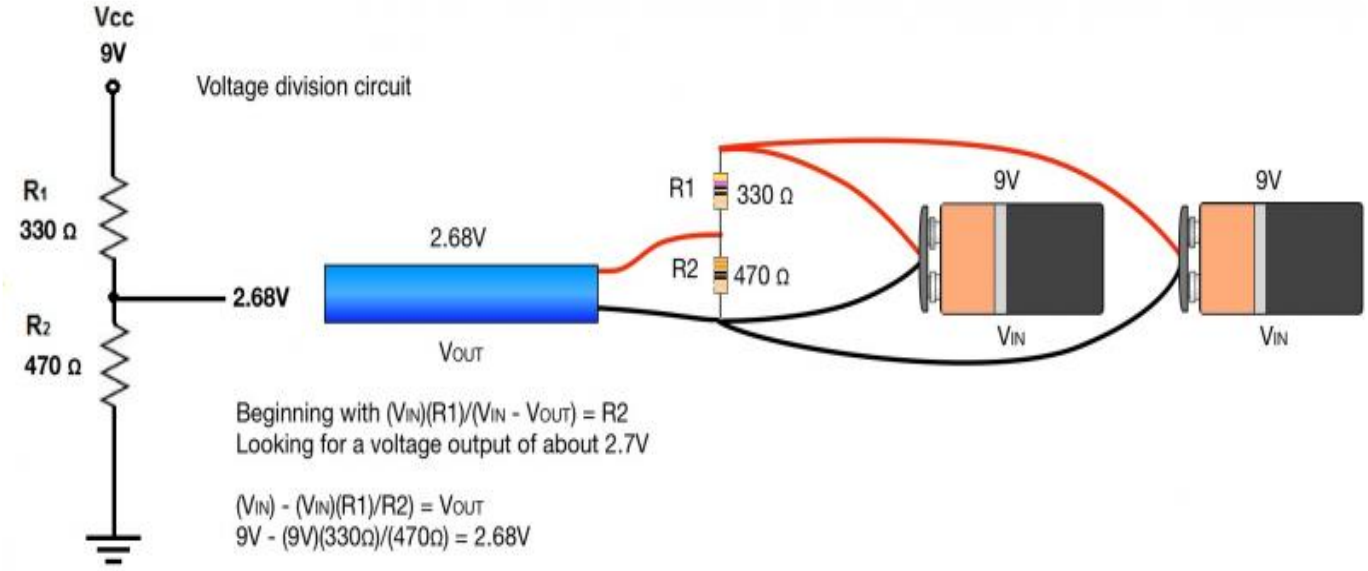
BC2: between 0.5032V and 0.5141V (from previous reading of 0.5032V, so BC2 is pretty stable.)

I just need a few components to complete the voltage circuit.

^ v • Reply • Share ›

gdaigle • 2 years ago

This is what I have in mind for the biasing test. Planning on keeping the two 9V batteries attached for anywhere from 10 - 24 hrs.



2 ^ | v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Looks good, to me! Then again, I don't know what I'm talking about...

^ | v • Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

Actually, my formula was off, but corrected it in the latest post.

1 ^ | v • Reply • Share ›

gdaigle • 2 years ago

Today's morning update (7-14-17) from last readings:

BC1 + 24hrs: 1.8736V (down from 1.9821V, continuing the fall from its 2.77V recharge value)

BC4 + 23hrs: 0.4388V (up from 0.4198V, continuing the rise from its 30.5K ohm resistor discharge)

FC1 + 23hrs: 0.3837V (down slightly from 0.3882V, reversing the rise above its 0.3206V origin)
BC3 + 23hrs: 1.4605V (up from 1.4049V, continuing the rise towards it 1.6160V origin)

BC2 + 22hrs: 0.5032V (same as before, getting ready for 9V bias tests)

Observation: It may be that the Orbo blue cells have a memory. That is, if they stay at a fractional voltage for a longer period of time, a discharge may then initiate their self-recharging but only to an amount a bit above their fractional voltage. That may be why FC1 rose above its initial voltage of 0.3206V but not much more, and why BC3 continues to rise towards its initial voltage of 1.6160V.

Perhaps that is what the biasing is about — keeping the cells charged (biased) up to near their maximum so that when charging a cell phone, the recovery is towards that maximum as quickly as

possible. As part of the circuit, the batteries (9V cells used in the O-Cube, but Shaun said it should have been rechargeable Li-ion batteries) are recharged along with the Orbo blue cells.

That suggests that I should keep BC2 charged at a higher capacity for a longer period of time than my 10-20 sec charges with 2 AA cells, but what the volts and amperage should be are just my guess.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

Update on BC1:
After another 11 hrs BC1 is now down to readings between 1.9989V and 1.9821V. So it has fallen below 2.0V. I'll keep tracking this to see where it stabilizes (assuming it will do so).

Update on BC4:
Recall that last week I took readings with various resistors attached in parallel with probes to BC4. BC4's reading started at 0.2317V, but while attached to a 30.5K ohm resistor it discharged quickly down to 0.2053V. That was 7-9-17 at 2:17pm. Today, 92 hrs later, the reading is 0.4198V. So it is recovering (self-charging) nicely and suggests that the voltage where the cells stabilize their voltage indefinitely after either a recharge from a battery or after a deep discharge, is somewhere between 0.42V (BC4) and 1.98V (BC1).

Update on FC1 and BC3:
Here is an update of the recovery of cells FC1 and BC3 after a quick discharge. Both voltages have dropped since the last time. Not sure why, but they have been in different interior spaces over the past few days and moved around in a bag where I thought they were well insulated, so possibly due to my moving them around a bit without sufficient insulation?:

FC1
Original voltage: ranges between 0.3038V and 0.3206V
Reading after momentary discharge: 0.0270V
After 24 hrs: 0.3054V
After 50 hrs: 0.3162V
After 72 hrs: 0.3289V
After 96 hrs: 0.3394V
After 224 hrs: 0.4252V
After 287 hrs: 0.3882V (still above original voltage)

BC3
Original voltage: 1.6160V
Reading after momentary discharge: 1.3805V
After 24 hrs: 1.5446V
After 50 hrs: 1.3678V
After 72 hrs: 1.4561V
After 96 hrs: 1.4643V
After 224 hrs: 1.4879
After 287 hrs: 1.4049V

I think it's time to start the biasing tests with the two 9V batteries. Will probably use BC2, first getting a baseline and then putting the batteries in parallel to get 1250mA and 9V, and then reducing the

voltage with a simple voltage divider circuit using some of my resistors.

2 ^ v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

They might not stabilize anywhere. They might just go up and down. I wonder if they are harnessing some kind of exotic energy that we are not aware of, yet. Perhaps it is affected by the surroundings. Any thoughts on that possibility, Greg?

By the way, those are neat websites that you have. I would love to have a small apartment that could be made to float around to wherever I want to go.

^ v • Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

Thanks. Since I was shown that the likely cause of the immediate recovery after a discharge is voltage rebound, I should run additional tests to minimize the possibility of temperature and power line noise being a source of energy harvesting. However, since BC1 is slowly trending downward I would think that if the cells are harvesting environmental energy that the trend would be upward much earlier in the tests. To me, this indicates there is no energy harvesting and that any self-recharging is due to the composition of the cells. Exotic energy? I think that Shaun's explanation about magnetic domains in more likely.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

The latest scope reading for BC1 after another 12.75 hrs is between 2.049351V and 2.032527V. The reading lasted only a few seconds. At this point I do expect the sustaining voltage to drop below 2.0V, but it took over 62 hrs to get here.

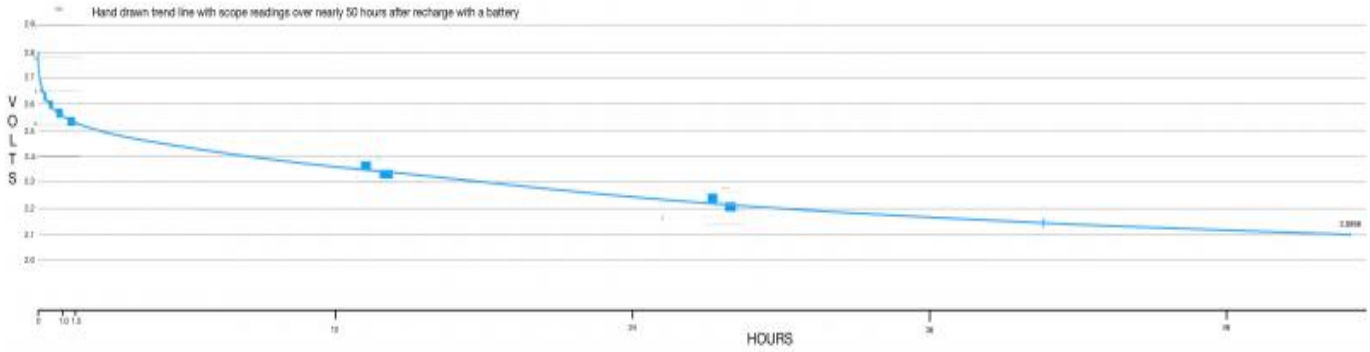
1 ^ v • Reply • Share ›

gdaigle • 2 years ago

Here is the fifth scope reading of BC1 after another 12 hours: 2.0998V. I took the reading over only 10 seconds.

The full set of readings has been close to 50 hrs and the drop in voltage has been from 2.7703V to 2.0998V, so a delta of 0.6705V. Without the probes attached the drop may have been somewhat less.

To see the whole trend I've composited the tracings and hand-drawn a trend line intersecting with the tracings, which have been positioned and scaled:



2 ^ | v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Thanks, again, Greg, for putting in all of this effort. If that so-called "jury" had put in half the effort that you are putting in they would have, probably, come to the conclusion that this tech is the real deal...even though it may not, quite, be ready for prime time, so to speak. This seems to fit a pattern: the more effort that people put in to trying to understand Orbo, the more likely that they are to believe that the Orbo is the real deal.

By the way, do you have a website, Greg? I thought that I heard, somewhere, that you do, but I could be getting you mixed up with someone else...

1 ^ | v • Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

I have two websites. http://www.gravitymodificat... is a blog covering work on the Extended Heim Theory framework. New postings are every few months or as papers are published by Hauser and Droescher. Some images I created while under Steorn's NDA are at: http://gravitymodification....
My personal website is http://www.theunlitpipe.com.

BTW, the jury was frustrated by lack of access to Steorn's IP, so some of their frustration was completely justified.

2 ^ | v • Reply • Share ›

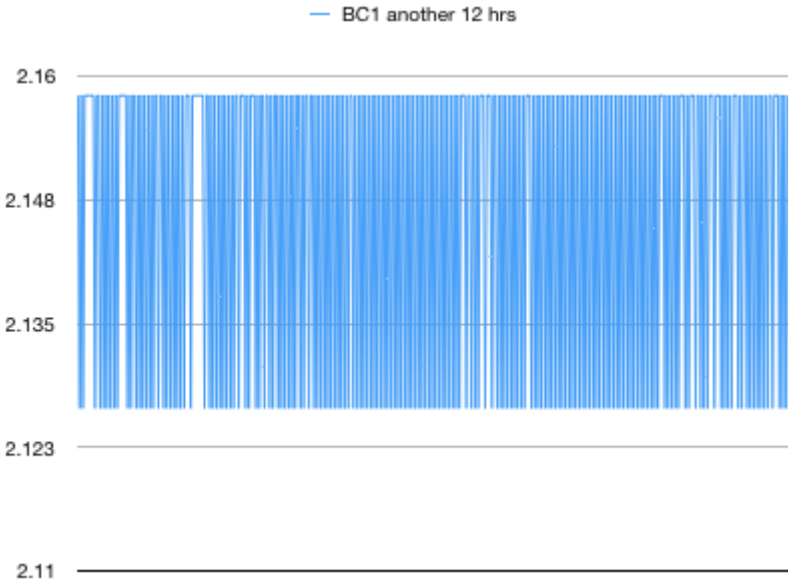
Mark ➚ **gdaigle** • 2 years ago

I hear what you're saying about some of their frustration being justified, but I also think that some of the problem was their own pseudoskepticism and unwillingness to try hard, like you are.

^ | v • Reply • Share ›

gdaigle • 2 years ago

Here is the fourth set of scope tracings after the battery recharging of BC1. This was a short duration reading, lasting only 2 minutes.



The voltage begins at 2.1581V, which is identical to the minimum of the prior reading from 12 hours ago. The minimum of this reading is 2.1264V and from the frequency of readings at that lower voltage appears to be midway through the transition. Again, the spiking is due to the limit of my scope at that particular voltage setting (V/div).

A reading half an hour later at a lower V/div setting puts that voltage closer to 2.1503V, so not much movement over this additional 12 hour period. Seems like the sustaining voltage is close!

Reply • Share ›

gdaigle • 2 years ago

Here is the next set of scope tracings after the battery recharging of BC1. The voltage of the cell is read over 95 minutes and the recording ends 12.5 hours after the prior recording.

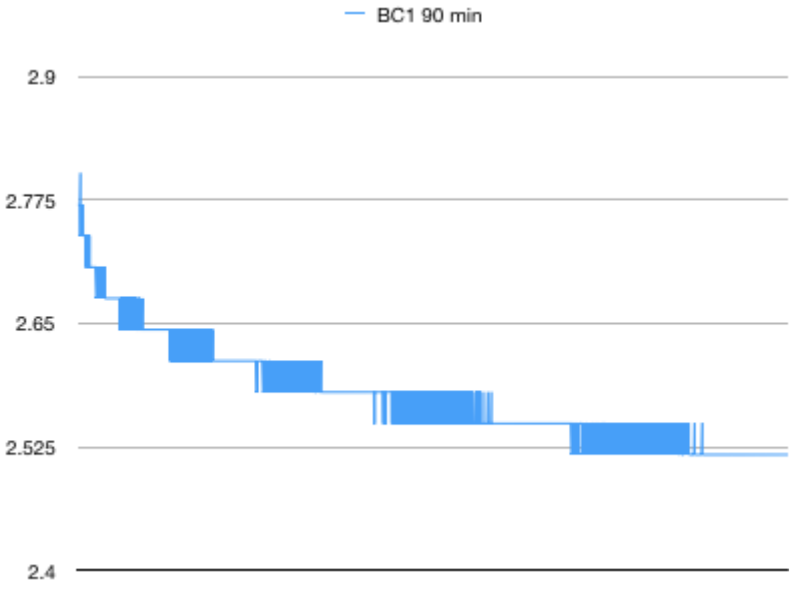
The voltage begins at 2.2529V (0.0632V less than the minimum of the prior reading) and continues downward, with the minimum of this current reading now being 2.1581V. That is a drop of 0.0948V. Since that drop during the 95 minutes is more than the drop in voltage of the cell over the previous 12.5 hrs without the scope and probes attached, I suggest that they are draining the cell faster than it would without the scope attached.

see more

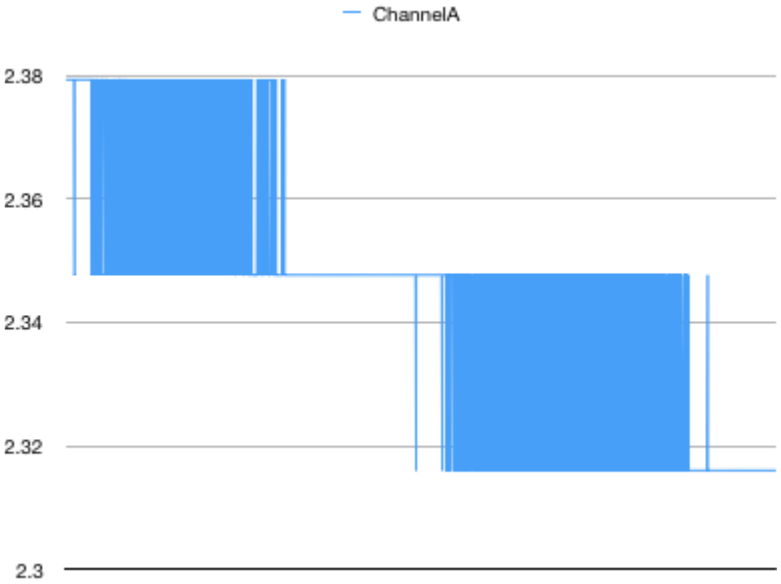
1 Reply • Share ›

gdaigle • 2 years ago

Here is the redo of recharging BC1 for 2 minutes with 2 AA batteries in series (2.78V) and recording the voltage for 90 minutes after the batteries have been removed.



This recording of BC1 later in the day ends 11.5 hours after the first recording and again is for 90 minutes. It is trending down to 2.3161V. I suspect it might continue to decline but could well stablize above 2.0V.



The end voltage of the first chart is 2.5174V and the beginning voltage of the second recording is 2.3793V so it's clear that the voltage continues to decline even without the probes attached. As noted a day ago, if the voltage sustains above 2V and if a 50K ohm does not drain it, there would be sufficient power to charge two cell phones a day and a bit more for the eight blue cells in the O-Cube.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

Here is an update of the recovery of cells FC1 and BC3 after a quick discharge. They continue to rise. If this is "voltage rebound" then it is a very, very long voltage rebound. Perhaps the first few minutes

or hours might have been voltage rebound, but clearly in FC1 we see a voltage that continues to increase above the initial voltage reading before discharge many days after the discharge occurred.

My earlier measures of recovery during winter assumed this was self-recharging, while others have suggested it is the voltage rebound of a capacitor. I do not know where to draw the line. However, if we assume this is self-recharging then I should again do tests to isolate it from power lines and to subject FC1 to low temperatures.

FC1
Original voltage: ranges between 0.3038V and 0.3206V
Reading after momentary discharge: 0.0270V
After 24 hrs: 0.3054V
After 50 hrs: 0.3162V
After 72 hrs: 0.3289V
After 96 hrs: 0.3394V
After 224 hrs: 0.4252V (at least 0.1046V over original voltage)

BC3
Original voltage: 1.6160V
Reading after momentary discharge: 1.3805V
After 24 hrs: 1.5446V
After 50 hrs: 1.3678V
After 72 hrs: 1.4561V
After 96 hrs: 1.4643V
After 224 hrs: 1.4879

2 ^ | v • Reply • Share ›

Ged ➚ **gdaigle** • 2 years ago

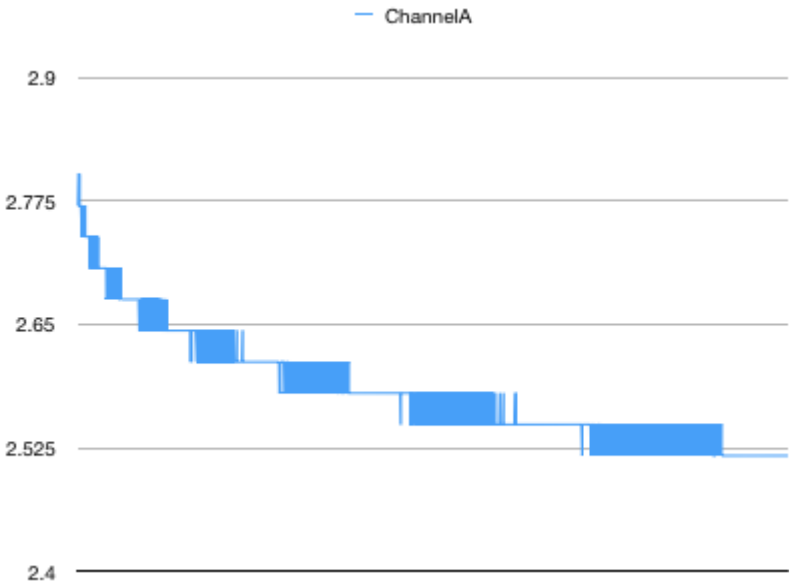
Ultimately using resistors to measure the energy out over multiple recoveries is the true measure of recharging. So far the testing seems to show that it is indeed regenerating energy content, which would be true recharching--but more data needed for more confidence.

I greatly appreciate all the testing you are doing, and am excited to see where it will go!

^ | v • Reply • Share ›

gdaigle • 2 years ago

Here is the first part.
Cell BC1 was charged with two AA batteries for two minutes. Voltage of the batteries was 2.77V.
I then removed the batteries and watched BC1 discharge, recording for an hour. No resistor in parallel:



Lowest reading after an hour was 2.514V. I'll take more readings in the morning to see if we can establish a baseline for that cell.

1 • Reply • Share ›

gdaigle ➚ gdaigle • 2 years ago

Accidentally shorted the leads this morning. Oops! Repeating test.

• Reply • Share ›

gdaigle ➚ gdaigle • 2 years ago

I ran the above test again (recharging BC1 for 2 minutes, taking recordings for 90 minutes this time. The graph was nearly identical to above. I'll test the cell again in 10 hrs to see where it is.

• Reply • Share ›

Frank Acland ECW Admin ➚ gdaigle • 2 years ago

Thinking about it, I may have been wrong about wiring the bias in series. In the Ocube the external bias was added to the two ports that were built into the underside of the unit.

1 • Reply • Share ›

gdaigle ➚ Frank Acland • 2 years ago

Since the cells as wired in the cube appear to be set up in parallel (at least four of the cells were all wired together, red to red, black to black), I probably shouldn't wire just one to a 9V source as I don't know if it would damage the cell.

I believe that when charging cells that are in parallel, voltage is the same as the source to all cells, but current is divided across cells. In series it is the opposite (current the same, voltage divided). So that sounds like there should be a voltage regulator from the power source if using a 9V source. The capacity of

the two AA batteries apparently did no harm to the cells and they have about 2850 mAh while the 9V has 625 mAh.

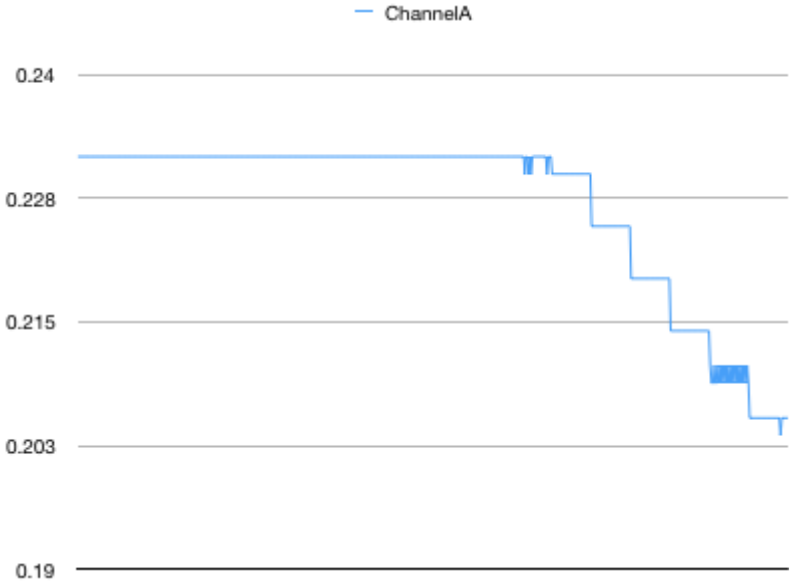
1 ^ v • Reply • Share ›

gdaigle • 2 years ago

I did another set of tests using a 10 minute recording baseline using BC4 after it returned to the previous voltage of 0.2317V.

10 minute recordings with scope set to 20mV range, 20ms samples, recorded at 10 samples per second.

500K ohm: 0.2317069V steady over 10 minutes
100K ohm: 0.2317069V steady over 10 minutes
30.5K ohm: 0.231769V for almost 2 minutes, then quickly began stepping down to 0.2053225V. Recording ended after 3 minutes.



The results are not much different from last time, working out to 7.6*10^-6 A, or about 1.76*10^-6 W. Over 24 hrs that works out to 0.152064 J.

Therefore, CWatters' numbers still hold with these readings.

But it could also be that this cell is underperforming. So if I take the highest reading I have recorded from one of the cells (BC3 read 1.26V without first charging it with a battery) and assume a slightly higher resistor value of 50K ohm, then that works out to 0.03175 W, which can deliver 2,743 J over a day. Multiply that by the 8 cells and that would work out to 21,944 J which would be enough to recharge a cell phone in 24 hours. Of course, it would also need to recover during the day, which it could not at that voltage (or charge a second phone as claimed by Steorn). Between charges might be when the Li-ion batteries would be used to boost the power of the blue cells back to near the top so that they could continue to recharge themselves more quickly.

Considering that after giving the cells a quick battery boost I can recharge them quickly and then they fall to about 2V (and as I recall, Shaun said that when working properly they might even retain a higher voltage), let's assume a properly working voltage of 2V and a resistance of 50K ohm. That

would work out to 0.08 W per cell and 6,912 J, which across eight cells is 55,296 J, well above what would be needed to recharge 2 cell phones in a 24 hour period AND may give time for the blue cells to recover during that period. Is it enough to recharge the Li-ion batteries as well? Not sure.

So I don't think we're down for the count just yet.

1 ^ v • Reply • Share ›

Frank Acland ECW Admin → gdaigle • 2 years ago

Greg, one thing that you have not been doing , which Steorn, did was to use biasing. With the Ocube they had 2 9V batteries supposedly connected to the cells with at 1 megaOhm resistor which was supposed to help with recharging the cells. Of course this brings in an external conventional power source which complicates things. With the second pack I got from Steorn, they used one half cell to bias the active cell (but that pack did not work right either). Anyway, that was apparently an important aspect of these devices for performance purposes -- just thought I would mention it.

1 ^ v • Reply • Share ›

gdaigle → Frank Acland • 2 years ago

I just tried recharging BC1 with two AA batteries, and then testing the voltage in the cells after a short period of time. It took several minutes for it to slowly come down to around 2.5V. I didn't want to go with too high a voltage above their normal operation for this test. Let me try that again with a longer term recording and see where the voltage is after several hours.

Then I will try charging a cell with a 9V battery to boost its voltage and do the same test. When Shaun mentioned the biasing with the 1M ohm resistor, do you think it was set up in parallel as I have done before? Or was it in series?

^ v • Reply • Share ›

Frank Acland ECW Admin → gdaigle • 2 years ago

I believe series, Greg

^ v • Reply • Share ›

CWatters • 2 years ago

Ok so if we assume a cell can deliver 0.2V into 25kohms that works out at about 1.6uW. That's 1.6*10^-6W. In a 24 hour period it can deliver about 0.14 Joules of energy. To charge a 2000mA 3V phone battery takes about 21,600 Joules. I think it would take about 150,000 days to charge a phone :-)

1 ^ v • Reply • Share ›

gdaigle → CWatters • 2 years ago

Remember that there are 8 blue cells in an O-Cube, so that's only 18,750 days to charge a phone (!)

1 ^ v • Reply • Share ›

CWatters → gdaigle • 2 years ago

1 down, only 5 orders of magnitude more to find :-)

Reply • Share ›

gdaigle • 2 years ago

I believe that I have a threshold for the resistance.

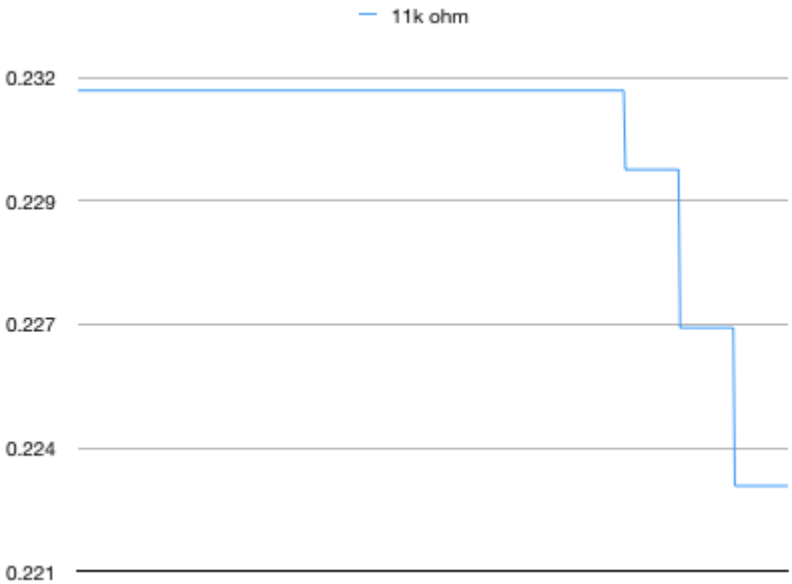
New setup:

Thanks to the folks at LabNation I have a better setup for my measurements. I changed my V/div signal sampling to reduce the height of the stair stepping. It is now set to 20.0 mV down from 5V. That should result in a step size of 1.3 mV with the scope's current chip. I also reduce my time base interval to 10.0 ms from 100 ms.

To allow me to take longer continuous recordings of data without blowing through my 65K datapoint limit I also changed my recording interval so that instead of sampling at every interval I instead changed it to record every 10 seconds. [Note: that must interact with another parameter because over 120 seconds 417 data samples were taken]. I also changed the probe settings from x10 to x1.

The results were really great and give us a clue as to the power of the cells. Here are the results of recordings over 120 continuous seconds:

500K ohm: 0.2317V steady
100K ohm: 0.2317V steady
30.5K ohm: 0.2317V steady
25.5K ohm: 0.2317V steady
11K ohm: 0.2317V to begin, then reduced to 0.2229 in steps over 120 seconds:



I could try to find resistors between 11K and 25.5K to get a more nuanced reading. Until then, might someone here do the power calculations based on this data, or, let me know what other data I should collect.

3 Reply • Share ›

Frank Acland ECW Admin ➚ gdaigle • 2 years ago

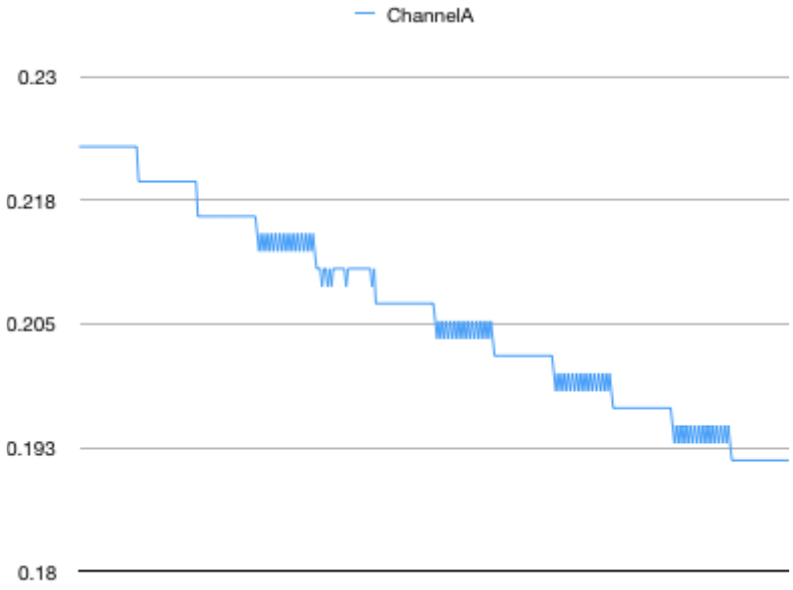
Thanks for your reporting, Greg. Have you tried monitoring the voltage for longer than 120 seconds with various resistors? My experience has been that over longer periods of time the voltage fluctuates -- higher or lower depending on the resistance.

1 ^ | v • Reply • Share ›

gdaigle ➚ **Frank Acland** • 2 years ago

I did another test using the 25.5k ohm resistor. It did begin to drain after a few minutes and as it ran longer the decline happened faster. I stopped it at 5 minutes but then noted that the recording rate had reset itself to every 20ms. So it actually took well over a million samples before Excel gave up. By then it had drained to near 2.2V.

So I did it again using the settings from before and immediately the cell began to drain. Here is the recording:



I let it go for only 120 seconds because of the rate of decline down to 0.1912V.

I think I should let the cell recover again, maybe for a day before I try this again.

2 ^ | v • Reply • Share ›

Frank Acland ECW Admin ➚ **gdaigle** • 2 years ago

Thanks Greg. It will be interesting to see the recovery time after a longer discharge. It seems the more power you suck out of these cells, the longer the recovery time.

1 ^ | v • Reply • Share ›

gdaigle ➚ **Frank Acland** • 2 years ago

Why don't I go a step up to 25.5K ohm and give that a 10 minute test?

^ | v • Reply • Share ›

gdaigle • 2 years ago

The readings on BC1 are still very low, so I'm going to switch over to reading BC4 to determine if the rate of voltage decrease is greater with just the scope and its probes attached, or if the rate of

decrease is greater with scope and a 500K ohm resistor in parallel.

I started with the 500K ohm resistor in parallel with the cell, and later took more timed readings:

Initial reading: 0.6717V
Over about 2 minutes the voltage decreased to 0.6612V (-0.0105V)
However, recall that at my current settings, the scope reads in steps, so I next used timed readings at 60, 90 and 120 seconds and recorded the number of times the voltage dropped to the next lower voltage value before going back up again:

Checking the voltage drop with only the 100K ohm scope and probes attached to BC4:
Initial reading: 0.6612V
After 60 sec: min 0.6444V (4 times over 3040 samples), max 0.6612V
After 90 sec: min 0.6444V (37 times over 2241 samples), max 0.6612V
After 120 sec: min 0.6444V (337 times over 2113 samples), max 0.6612V

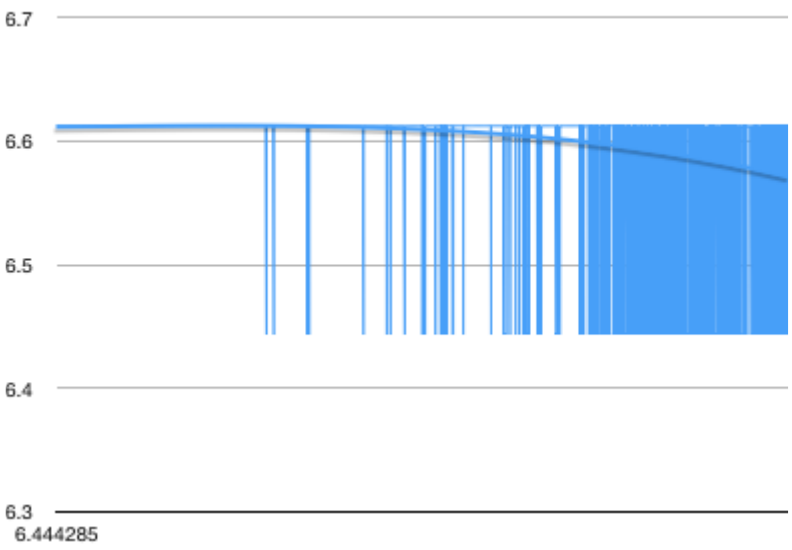
So there were just a few readings at 0.6444V after a minute, and 16% of the readings were at 0.6444V after two minutes.

To be more accurate than that first 500K ohm resistor reading, I did timed readings again a few minutes later.

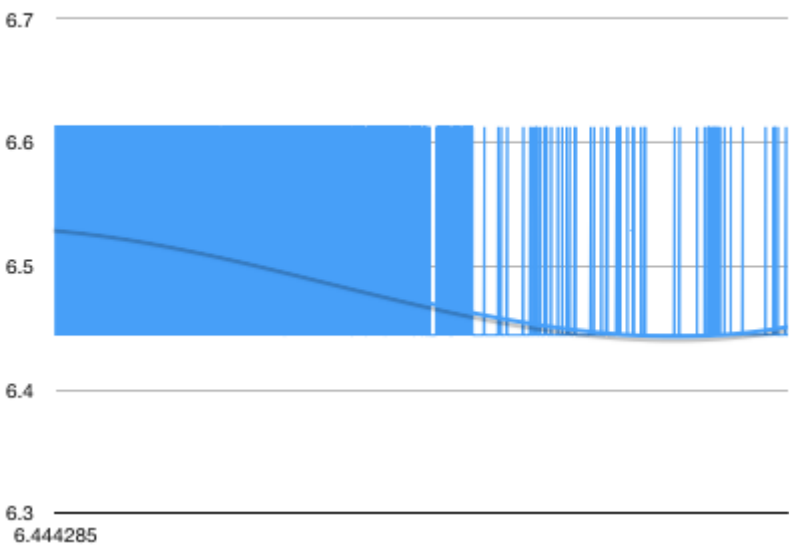
Again with 500K ohm resistor in parallel:
Initial reading: 0.6612V
After 60 sec: min 0.6444V (1280 times over 2561 samples), max 0.6612V
After 90 sec: min 0.6444V (3278 times over 4714 samples), max 0.6612V
After 120 sec: min 0.6444V (5216 times over 5281 samples), max 0.6612V

Half of the readings were at 0.6444V after a minute, and nearly all (98.8%) of the readings were at 0.6444V after two minutes.

Here is the trend line (3rd order polynomial) for probes + scope over the full 120 seconds (please note that this represents three separate readings of 1.3 sec to 5 sec each over that time, which is why I combined them with a trend line):



And the same trend line for the 500K ohm resistor over its full 120 seconds (again, 3 separate readings combined):



I don't know if the rate of decline is greater or not between the two tests, but it is certain that the decline is much slower than with the 330 ohm resistor.

The other thing I noted is that with the 330 ohm resistor and BC1 is that the beginning average reading was about 10% that of reading the cell alone. Why, I am not sure, but it is not the case with the 500K ohm resistor.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

BC 1 and resistor tests using various resistors

BC1
Initial reading: 0.4549V steady
Stayed there during the 8 second reading.

BC1 + 330 ohm resistor in parallel
Beginning average reading: 0.0513V
Over 13 seconds the voltage decreased to 0.01767V

That is a very quick decline. Apparently I'll have to use a much higher value resistor to keep the cell from losing voltage. I will try 100K ohm after the cell recovers to a voltage similar to the initial reading, which might take another couple of days.

I might instead do the test again with another cell (BC4) while BC1 recovers.

^ v • Reply • Share ›

gdaigle ➚ **gdaigle** • 2 years ago

I will test again today using a 100K ohm resistor and see how that compares to the readings from the 500K ohm resistor. If the trend line is similar I will go on to testing with a 30.5K ohm resistor, then 25K ohm, then 11K ohm. I may also have a 5K ohm pot around, so if the trend

line does not change through 11K ohm I could employ the pot in steps. Sorry this is taking so long, but due to the long recovery time of individual cells I want to step down carefully.

Reply • Share ›

CWatters ➚ gdaigle • 2 years ago

Seem clear the cells cannot deliver the power Steorn claimed or anywhere close.

Try increasing the resistor value until you find a value where the voltage stops falling. With the voltage and that resistance you can calculate the long term power output.

2 Reply • Share ›

Frank Acland ECW Admin ➚ gdaigle • 2 years ago

My experience is the more wattage that gets sucked out of the cells, the longer the recovery time.

1 Reply • Share ›

Andreas Moraitis ➚ Frank Acland • 2 years ago

More power ("wattage") or more energy?

Reply • Share ›

Zephir ➚ Andreas Moraitis • 2 years ago

Why not both? But Steorn cells operated at higher voltage ~ 9 Volts maintained by external cells, I guess. The rectifying effect of graphite particles should be proportional to voltage, so that the energy production should rise with voltage used. In his previous experiments Frank Acland managed to restore the function of cells by their polarization and even McCarthy has been impressed with it, if I remember well.

Reply • Share ›

Andreas Moraitis ➚ Zephir • 2 years ago

That's why I asked this question. Normally, one would rather expect a correlation between recovery time and energy, but not necessarily power. Comparing the two relationships might allow some interesting conclusions. At least, one could try to analyze the differences between these cells and other types of devices, such as batteries and capacitors, or combinations of both.

Reply • Share ›

Zephir • 2 years ago

Steorn had whole pile of Orbo cells on stock. Where they all ended?

Reply • Share ›

cashmemorz ➚ Zephir • 2 years ago

Probably lawyers sent Orbo into bankrutcy and banks sold hardware, lock stock etc. to the highest bidder or just enough to cover anything borrowed from them . Investors are another story. Usually investment house loses whatever invstors "gave" them. So investment house just kept that part of investments to cover operating costs of holding the invstment. The rest went to Orbo. The buyers of the hardware might revive the IP, if they understand the appropriate physics. Have they considered the new physics of Randell Mills? It seems to work. Universities are giving lectures with Randell present or by others. That says mountains in Mills' favor. And if his devices, based on his theory, all six, have reached commercially sold status, as it seems they have, then that is the last clincher for me.
Edit: but for all my info , I still may be wrong. time will tell.

Reply • Share ›

Zephir ➚ cashmemorz • 2 years ago

I already proposed explanation how the Orbo-Cell works and it's not Mills physics

https://www.reddit.com/r/Ph...

Reply • Share ›

gdaigle ➚ cashmemorz • 2 years ago

Have not heard of anyone who has make a Steorn-Mills connection. Unlikely in that the distinguishing factor according to Steorn is use of magnetic domains employed within an electret employing materials used in supercapacitors. Nothing more exotic.

Reply • Share ›

gdaigle • 2 years ago

Todays readings are:
FC1:
Original voltage: mas of 0.3206V
Voltage 7-5-17 after (96 hrs): 0.3394V (continues to be higher voltage than original reading)

BC3:
Original voltage: mas of 1.6160V
Voltage 7-5-17 (after 96 hrs): 1.4643V (not yet up to original voltage reading)

Interesting that BC3 has recovered only 0.0838V since a few seconds after the initial discharge, and FC1 has recovered 0.3124 since the same amount of time after its discharge. Clearly the two cells are not recovering at the same rate. Reason, unknown.

I am going to let the above cells continue to recover for another 5 days or so, and then take another set of readings. Perhaps by then BC3 will have more fully recovered.

Meanwhile, I am going to initiate the test of BC1 with a 500K ohm resistor in parallel this evening and if it does not drain quickly then I'll keep the resistor attached and we can see what the readings are the next day.

1 ^ v • Reply • Share ›

Zephir ➚ **gdaigle** • 2 years ago

/* Clearly the two cells are not recovering at the same rate. Reason, unknown. */

One of cells looked damaged at your photos. It would be good to share all photos of the cells in test.

^ v • Reply • Share ›

gdaigle ➚ **Zephir** • 2 years ago

Those little half cells shown in the report (especially the one really smashed up) were used in other testing. One of them became HC1. FC1 and BC3 look in good shape, but without stripping off all of the outside wrapping you really don't know what the metal casing looks like.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

Here are the resistors I have on hand:

12 ohm
330 ohm
470 ohm
11K ohm
25.5K ohm
30.5K ohm
100K ohm
500K ohm

1Meg ohm
6.04Meg ohm

Using the values of a single cell and the calcs from CWatters, I might start with a 330 ohm resistor.

Also, looking at the scope's manual the Input impedance is rated at:
100kOhm // 2pF to GND
So would that suggest that I start above 100K, such as 500K?

1 ^ v • Reply • Share ›

Andreas Moraitis ➚ gdaigle • 2 years ago

Does the voltage remain stable, or does it even rise, if you connect your meter permanently to the cell? If so, you could start below 100 kOhm. If the voltage drops only with the meter connected, you should start above 100k. Especially in the second case it might be advisable to take the measurements as quick as possible, in order not to withdraw too much energy from the cell.

^ v • Reply • Share ›

gdaigle ➚ Andreas Moraitis • 2 years ago

My experience with the scope is that it does slowly drain the cell, which is why I take the readings quickly. Based on your comment, I will start with my 500K ohm. If that remains stable I can later do tests with resistors of 100K or less, allowing it time to come back to the initial levels after each test.

2 ^ v • Reply • Share ›

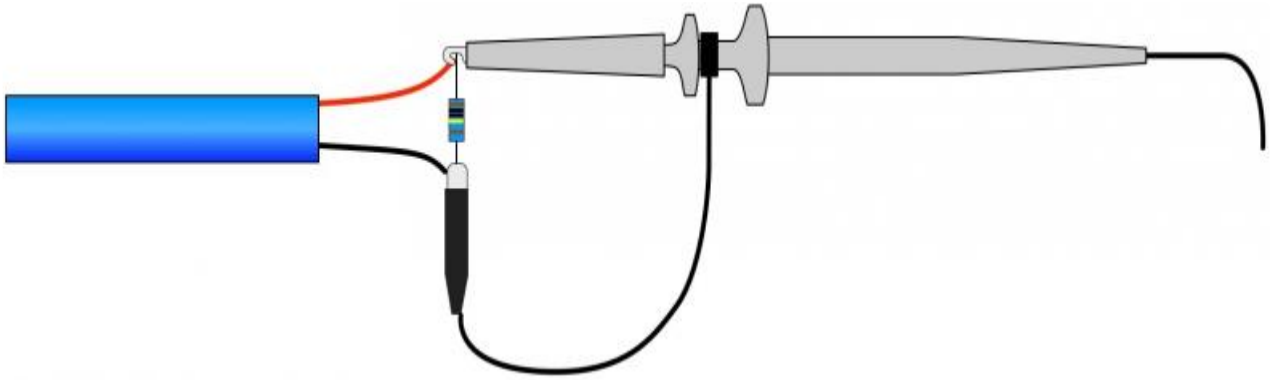
Frank Acland ECW Admin • 2 years ago

Greg, why don't you put a resistor across one of your cells and compare to the cells you have been testing. In my experience if the resistance is low they drain pretty quickly, so maybe start with a higher ohm resistor.

1 ^ v • Reply • Share ›

gdaigle ➚ Frank Acland • 2 years ago

Like a 1Meg ohm 1/8W in parallel?



1 ^ v • Reply • Share ›

Andreas Moraitis ➚ gdaigle • 2 years ago

Maybe you could try the following protocol:

1 – Measure the initial voltage.
2 – Connect a resistor in parallel to the cell.
3 – Monitor the voltage.
4 – If the voltage drops, disconnect the resistor, let the cell recover (important), and start again with a different resistor of a higher resistivity.

If the cell generates any ‘excess energy’, it should be possible to maintain at least equilibrium for a long (!) period of time, with the resistor being connected. Note that your meter has as well an inner resistance which must be taken into account. So it might be better to disconnect it after each measurement.

1 ^ v • Reply • Share ›

CWatters ➚ **gdaigle** • 2 years ago

More like 50 ohms. See my calculation below.

^ v • Reply • Share ›

Frank Acland ECW Admin ➚ **gdaigle** • 2 years ago

Sounds like a good starting point!

^ v • Reply • Share ›

Ged ➚ **Frank Acland** • 2 years ago

I can't believe the world of Orbo is heating back up again. If we can measure actual energy, then we can get definite answers.

Happy 4th of July, by and by!

1 ^ v • Reply • Share ›

Frank Acland ECW Admin ➚ **Ged** • 2 years ago

I think actual energy can be measured, but in my experience, with these cells, it's not very much for practical purposes. But I think they are useful for proof of concept purposes.

1 ^ v • Reply • Share ›

gdaigle • 2 years ago

After 72 hrs, here are today's readings of the recovery of cells FC1 and BC3:

FC1
Original voltage: ranges between 0.3038V and 0.3206V
After momentary discharge: 0.0270V
After 24 hrs: 0.3054V
After 50 hrs: 0.3162V
After 72 hrs: 0.3289V (Note: this has attained a voltage higher than the original voltage)

BC3
Original voltage: 1.6160V
After momentary discharge: 1.3805V

After 24 hrs: 1.5446V
After 50 hrs: 1.3678V
After 72 hrs: 1.4561V (Note: still rising. If it reaches original voltage, it would probably not do so for another 2 days. Still uncertain about why voltage dropped 24-50 hrs into the test.)

3 ▲ | ▼ • Reply • Share ›

Mark ➚ gdaigle • 2 years ago

Keep at it, Greg! It is encouraging that FC1 has actually gone higher than the original voltage.

▲ | ▼ • Reply • Share ›

CWatters • 2 years ago

Just measuring voltage is pointless. A potato casserole do that. You need to measure the power output. Put a small load resistor across the cells and calculate the long term sustainable power output.

1 ▲ | ▼ • Reply • Share ›

gdaigle ➚ CWatters • 2 years ago

I have resistors! I have more cells! Lay it out for me and I'll do the tests you prescribe.

1 ▲ | ▼ • Reply • Share ›

CWatters ➚ gdaigle • 2 years ago

Well as I recall they claimed Orbo could charge your phone at least once a day. Assume a phone has 2400mAH battery. That would mean Orbo should be able to generate around 100mA continuously. If the output is 5V then a suitable load resistor would be around 5/0.1=50 Ohms. Eg it should be able to maintain 5V across a 50ohm resistor indefinitely. At that rate it would take all day to recharge a phone so it represents a modest load compared to their claims.

1 ▲ | ▼ • Reply • Share ›

gdaigle ➚ CWatters • 2 years ago

There are eight blue cells in an O-Cube, so your calculations suggest each blue cell might be possible of 12mA. So far, 1.6V is the highest reading I've seen from an individual cell. The let's say 1.6/0.012 = 133 ohms. I have a 330 ohm resistor, so begin with that one?

▲ | ▼ • Reply • Share ›

CWatters ➚ gdaigle • 2 years ago

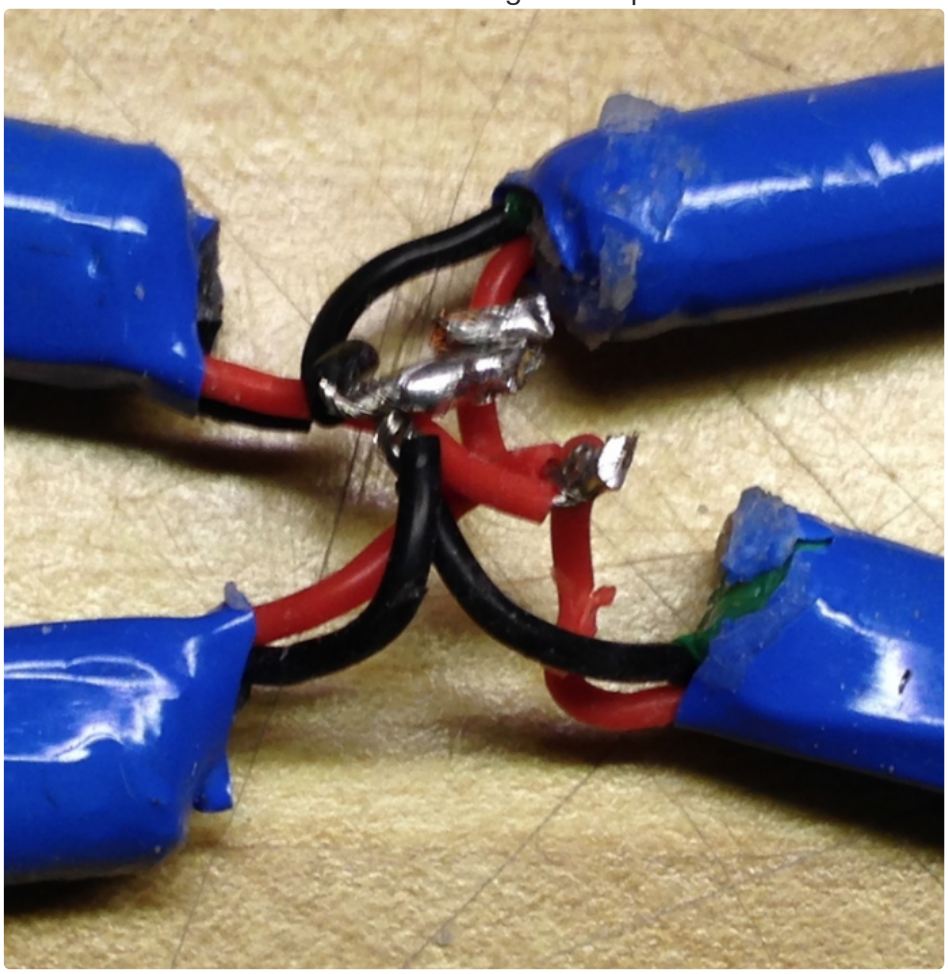
How are the cells wired up? If the cells are wired up so that they produce 1.6V then some sort of step up circuit must be in there to make 5V for the USB charging port. This step up circuit will increase the current drawn from the cells in the same ratio as the voltage. eg 100*5/1.6 = 312mA. Then divide that by 8 and you get about 39mA per cell and R = 1.6V/39mA = 41Ohms. But by all means start with what you have (330Ohms) and perhaps reduce later if they will cope with that.

▲ | ▼ • Reply • Share ›

gdaigle ➚ **CWatters** • **2 years ago**

Okay, I'll start with 330 ohms and see where that gets us.

I probably should have taken better notes on the tear-down, but I do know that at least four of the cells were wired together in parallel.



The whole effort of digging it out of the silicone mastic was a bit of a muddle.

Reply • Share ›

Zephir ➚ gdaigle • 2 years ago

You did a great work with it. But we should also move further with attempt for replication of these cells from scratch.

Reply • Share ›

Mark • 2 years ago

So many people think that this whole thing is a fraud, or just a big misunderstanding. (if they're being generous...) Yet, still, Greg, you are continuing. This is reminding me of a part of that Denzel Washington movie from a little over a decade ago called: "Deja Vu." (not to be confused with the video games, which are unrelated...except for the fact that they have the same name) There are parts of the movie where one character asks: "What if you had to tell someone the most important thing in the world, but you knew they'd never believe you?"

The other character then replies: "I'd try." You're trying, Greg, to let a bunch of people, who don't believe you, know that they may be denying one of the most important things in the world. I have a lot of respect for that. Here's the trailer for Deja Vu, in case anyone is interested:

Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

Even if a full recovery of the cells is not achieved in this series, there are still other series I can run. Yet I'm fully open to the possibility that none of these tests may pan out, either because I don't understand their usage of the 9V batteries... or because the technology just doesn't work. BTW, I thought Deja Vu a very good thriller (available on Netflix).

1 Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Cool. Still, I think that, at the very least, you are showing that too many people have been WAY too dismissive of this based on other stuff that has happened, like the closing up of Steorn.

Reply • Share ›

gdaigle • 2 years ago

Here are the results so far of the recovery of cells FC1 and BC3 after a quick discharge:

FC1
Original voltage: ranges between 0.3038V and 0.3206V
After momentary discharge: 0.0270V
Reading after 24 hrs: 0.3054V
Reading after 50 hrs: 0.3162V

BC3
Original voltage: 1.6160V
After momentary discharge: 1.3805V
Reading after 24 hrs: 1.5446V
Reading after 50 hrs: 1.3678V

FC1 is getting pretty close to its original voltage. BC3 seems to have lost some voltage since yesterday and is actually below that of the initial reading about 12 seconds after the discharge.

I am going to give it another day to see what happens to the voltages, and I will double check them with my analog meter.

2 ▲ | ▼ • Reply • Share ›

Frank Acland ECW Admin → gdaigle • 2 years ago

It's been a while, but I noticed in my testing that there could occasionally be sudden surges of voltage which would then subside. They would come and go for no apparent reason. 1.6 volts is unusually high in my experience testing these cells.

1 ▲ | ▼ • Reply • Share ›

Mark → gdaigle • 2 years ago

During that webcam run, I thought that I saw it vary, if my memory is right. (it might not be) It might go up and down over time, somewhat, before, or even after, it gets to the top.

▲ | ▼ • Reply • Share ›

LION • 2 years ago

A useful and interesting link:

http://www.dailymail.co.uk/...

▲ | ▼ • Reply • Share ›

roseland67 • 2 years ago

Shocking

▲ | ▼ • Reply • Share ›

gdaigle • 2 years ago

Interestingly, someone other than Steorn has come up with a cell phone that doesn't even have a battery. See: https://techxplore.com/news...

"Fundamentally, the team is using backscatter as a technique. A University of Washington news item earlier this year described it as an "approach that harvests ambient wireless signals to enable devices to communicate without draining battery power."

Carpineti said, "It basically uses the radio waves that already move around us to communicate."

Harris said it allows a device to communicate by reflecting incoming radio waves, "a bit like an injured hiker sending an SOS using the sun and a mirror."

2 ▲ | ▼ • Reply • Share ›

nietsnie ➚ gdaigle • 2 years ago

Sounds like crystal radio. I had one of those as a kid. No broadcast capability though...

Reply • Share ›

Omega Z ➚ gdaigle • 2 years ago

"approach that harvests ambient wireless signals"

That wasn't ambient wireless signals. That was the text message I never got. They sucked it right out of the air. LOL

2 Reply • Share ›

cashmemorz ➚ Omega Z • 2 years ago

Occupational hazard....

Reply • Share ›

Mark ➚ gdaigle • 2 years ago

That's pretty awesome! If they could get it to work well enough to put it on the market, then it might be even better than The Orbo Phone. The Orbo Phone could not be used perpetually. After a while, it would shut down and have to recharge itself. This new phone would not even have that limitation, and you could talk, theoretically, until the phone breaks down. There would be a market for something like this.

Reply • Share ›

gdaigle • 2 years ago

Looks like that stair-stepping I've been describing may just be a limiter on the analog to digital converter of my scope and not an artifact of the blue cells. If anyone has suggestions on how to adjust that, let me know.

Reply • Share ›

Zephir ➚ gdaigle • 2 years ago

These cells are said to have large internal capacity so that the steps are let say possible - but not fast oscillations around them.

Reply • Share ›

Mark ➚ gdaigle • 2 years ago

Wait...it's still slowly increasing the voltage, right? Or does this make all of your previous work null and void?

Reply • Share ›

gdaigle ➚ Mark • 2 years ago

It is still increasing the voltage, but I'm running new tests to see if the voltage can reach the initial voltage that the cells normally maintain. If it always recovers but never reaches the same peak voltage then over time the cells would lose their voltage. Of course, there may be some interaction with the 9V batteries in the casing. Perhaps they

need to be occasionally boosted if the voltage of the cells goes too low so as to not damage the domain structure.

Anyway, I had a very nice scope advisor just write that definitely it is the analog to digital conversion in the scope is causing the stepping. There is a chip within the scope that converts the analog voltage to a digital value. An 8-bit scope can produce 256 results (2^8) which are then mapped to the voltage range. If that range is 5V, then the voltage resolution is 5V/256 = 0.0195V. So, the scale would read 0V, 0.0195V, 0.0390V, 0.0585V etc. There would be no values in-between. A scope with a 10-bit chip can produce 1024 results (four times the resolution) and so forth for a 12-bit chip, etc.

Theoretically, using a smaller voltage range will let me see smaller voltage steps. But, that depends on the internal hardware. This may be why I saw different spike heights (stair stepping) when I took different blue cell readings, since I was often changing the voltage range of my captures.

1 ▲ ▼ • Reply • Share ›

nietsnie ➚ gdaigle • 2 years ago

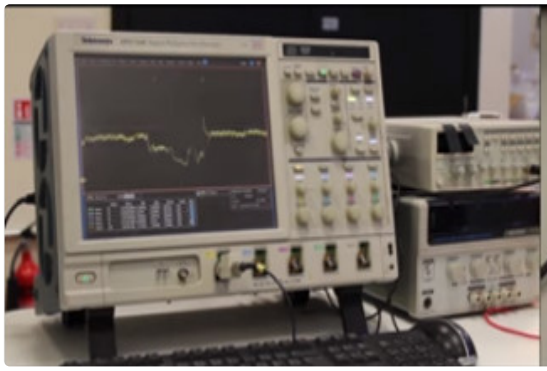
<<<
Perhaps they need to be occasionally boosted if the voltage of the cells goes too low so as to not damage the domain structure.
>>>

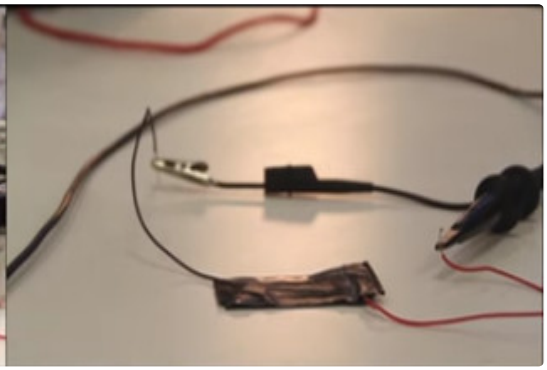
Try to avoid 'nail soup'.

▲ ▼ • Reply • Share ›

Zephir ➚ gdaigle • 2 years ago

These cells are said to have large internal capacity so that the steps are let say possible - but not fast oscillations around them. But hand-made demonstration Orbo power cell of small surface area also exhibited noisy output signal with piezoelectric like sensitivity of cell to the deform.





▲ ▼ • Reply • Share ›

Mark ➚ gdaigle • 2 years ago

Interesting stuff...didn't you say that Shaun also talked about steps? Maybe Shaun and the other folks at Steorn had a misunderstanding.

▲ ▼ • Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

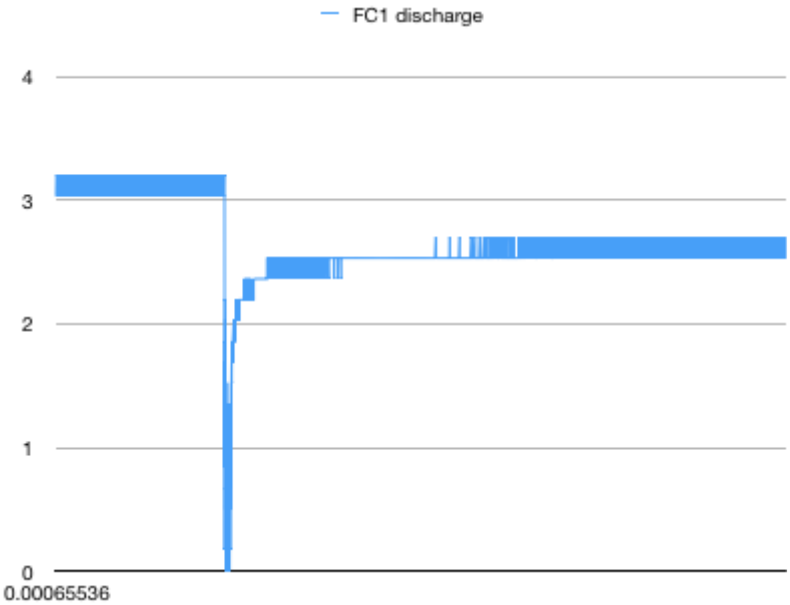
Shaun had mentioned steps as well as spikes. That is why I had assumed that the spikes and steps I saw were what he had seen. What I am seeing are clearly artifacts (I attached a pot to a DC power source, recorded the output, and again saw the spikes/steps). Maybe they were seeing artifacts, but they are much more familiar with their scopes than I am with mine so still a possibility but much less likely.

2 ^ v • Reply • Share ›

gdaigle • 2 years ago

So here is the current voltage of FC1:

FC1 7-1–2017 11:19am

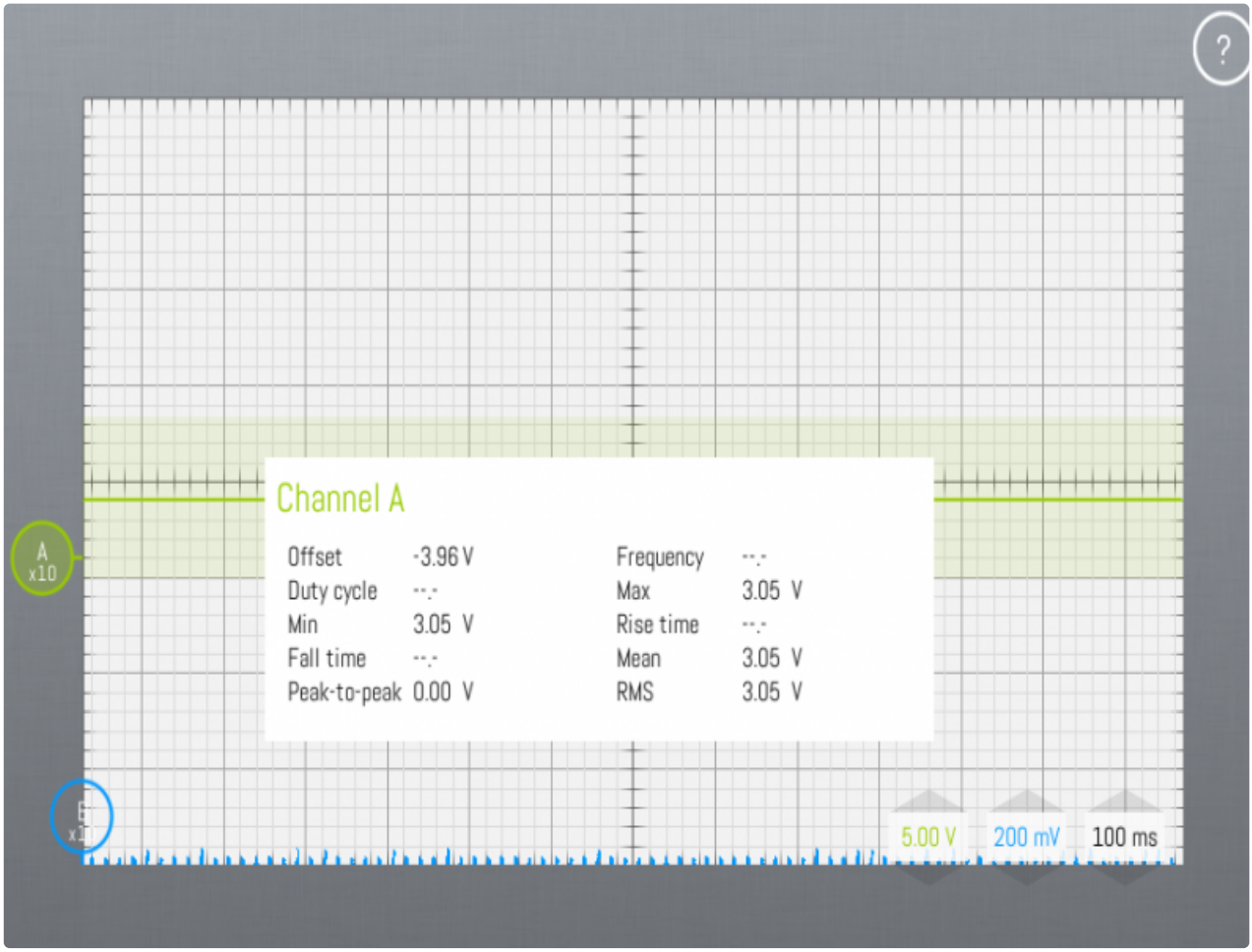


I will discharge the cell and keep tracking this cell daily to see if it can self-recharge and attain its starting voltage.

3 ^ v • Reply • Share ›

gdaigle ➚ **gdaigle** • 2 years ago

24 hrs later, voltage of FC1 is 0.3054 V, within the original voltage that ranged between 0.3038V and 0.3206V.



Reply • Share ›

Mark • 2 years ago

Okay, so, as I have posted, before, on multiple occasions, I'm no expert in this stuff. However, I did find something that kinda sounds like this. I'll let you guys decide if you think that it has anything to do with it:

http://www.sciencealert.com...

Reply • Share ›

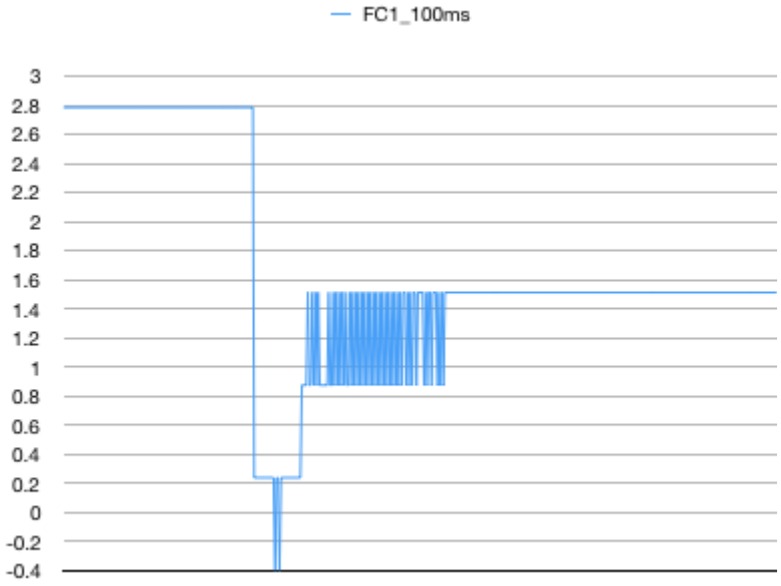
gdaigle • 2 years ago

I also did a series of tests about a week ago, seeking an answer to two other questions:

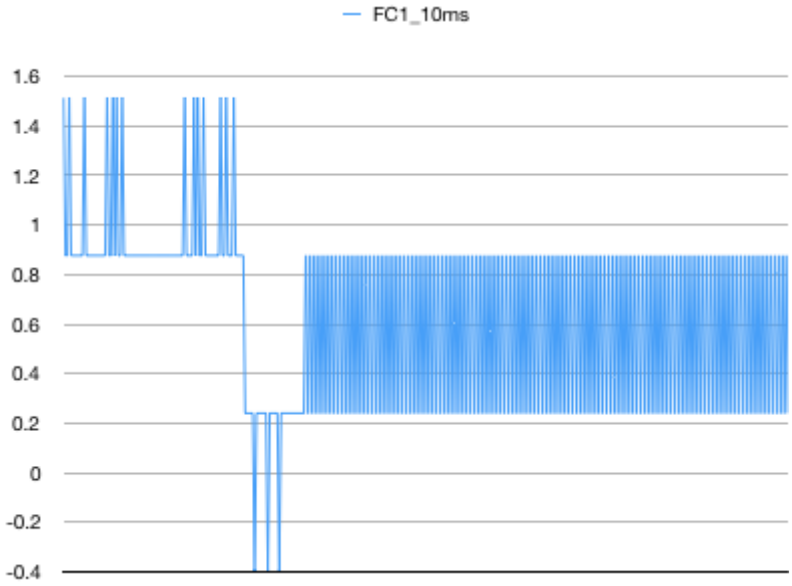
1) If the sampling rate of my scope might be influencing the height of the spikes
(result: it isn't)
2) Whether the current temperature of the cell might be influencing the height of the spikes
(result: between 25ºF and 75ºF no difference).

All those readings were all done with full cell #1 (FC1), so here are the scope tracings. Remember that the probes were set to x10, so the voltages are a tenth of those indicated in the tracings:

FC1 6-25-2017 4:41pm
Max starting voltage: 0.279V

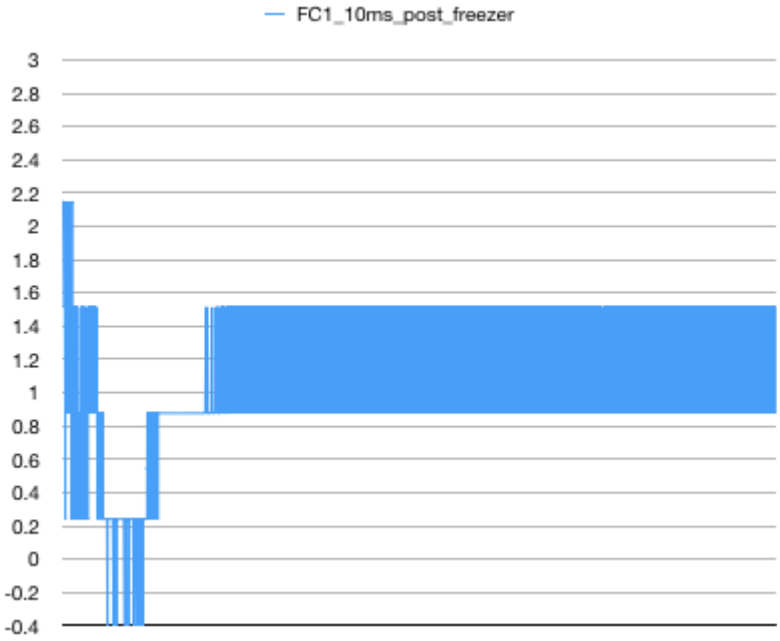


FC1 6-25-2017 4:44pm (a few minutes later)
Max starting voltage: 0.151V



Note that the initial voltage dropped a little bit before this second discharge because my digital scope does very slightly drain the cells.

FC1 6-26-2017 11:08am (18 hrs later)
Max starting voltage: 0.215V, which was not yet up to the starting point of 0.279V



The difference in voltage over 18 hrs = .064V (64mV), or about an increase of 3.5mV per hour.

FC1 6-27-2017 2:08pm (27 hrs later)
Starting voltage reading: 0.241V
No scope capture was taken, and there was not a discharge of the cell performed at this time. It is not yet up to the starting point of 0.279V

The difference in voltage over 27 hrs = .026V (26mV), or about an increase of 1mV per hour.
This is lower than before, but I suspect the rate of increase will diminish as the maximum voltage of the cells is approached.

Unfortunately, the next day I recharged FC1 with a 2.8V power supply, so all subsequent voltage readings would not be due to the purported self-recharging of the cell.

2 ^ | v • Reply • Share ›

gdaigle ➚ gdaigle • 2 years ago

(deleted image)

^ | v • Reply • Share ›

Omega Z ➚ gdaigle • 2 years ago

In your discussion/concern below about IP infringement-

I do not think that is an issue if you're only doing research.

If you create a product with intent to distribute or sell is a different story.

^ | v • Reply • Share ›

gdaigle ➚ Omega Z • 2 years ago

Legally, I'm probably on solid footing. But the O-Cube was lent by Shaun to Frank who lent it to me. In theory, Shaun could ask for it back at any time so I don't want to push the boundaries of his generosity.

Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

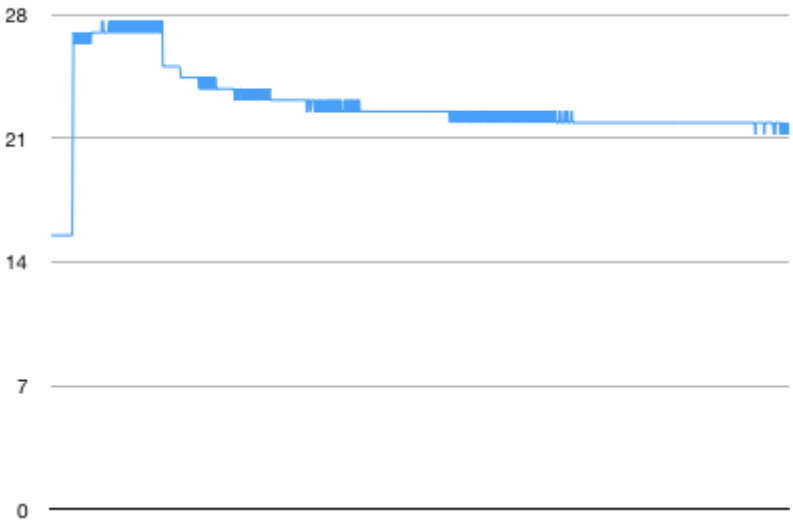
That seems unlikely, to me, that he would ask for it back. I thought that Shaun left the electronics business and is, now, trying to eke out an existence as an online poker player. Have you and/or Frank been in touch with Shaun, recently?

Reply • Share ›

gdaigle • 2 years ago

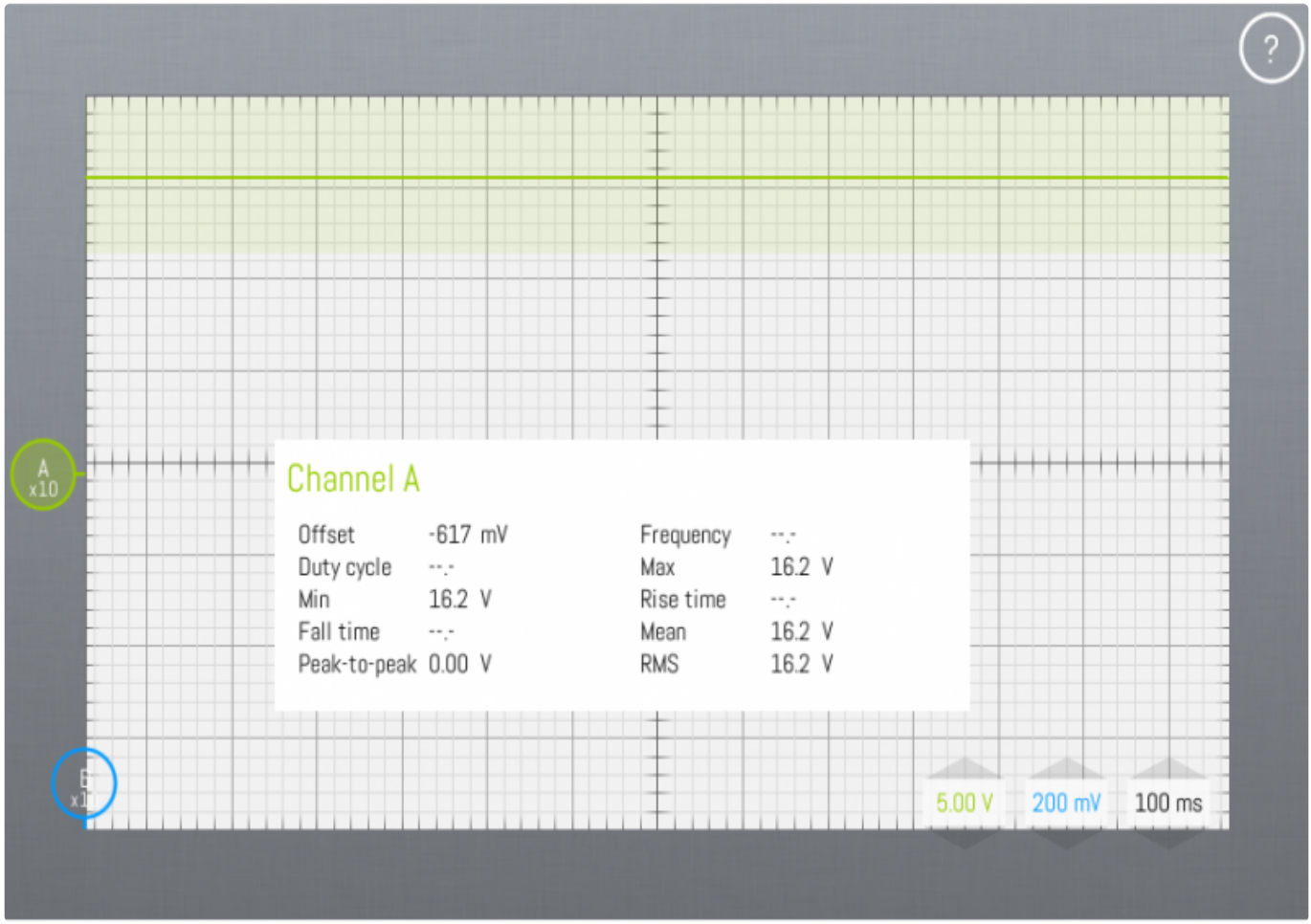
It appears that voltage rebound is a likely cause of the quick recovery of the blue cells. So then the question is whether the voltage reading of a cell hours or days after a discharge of the cell is capturing the cell at its full capacity or whether it is capturing the cell during its voltage rebound.

One indication of a full charge would be to recharge a blue cell above the voltage it was designed to maintain and then see what voltage the cell drops to and maintains. I did that with blue cell #3 (BC3) on 6-27-17. The beginning voltage was 1.55V (using x10 probes) and I recharged it with a 2.8VDC power supply. Here is the result of a 5 sec charge:



The trace shows that the voltage dropped over about 28 seconds to about 2.12V.

Today, four days later, the voltage of BC3 is 1.62V:

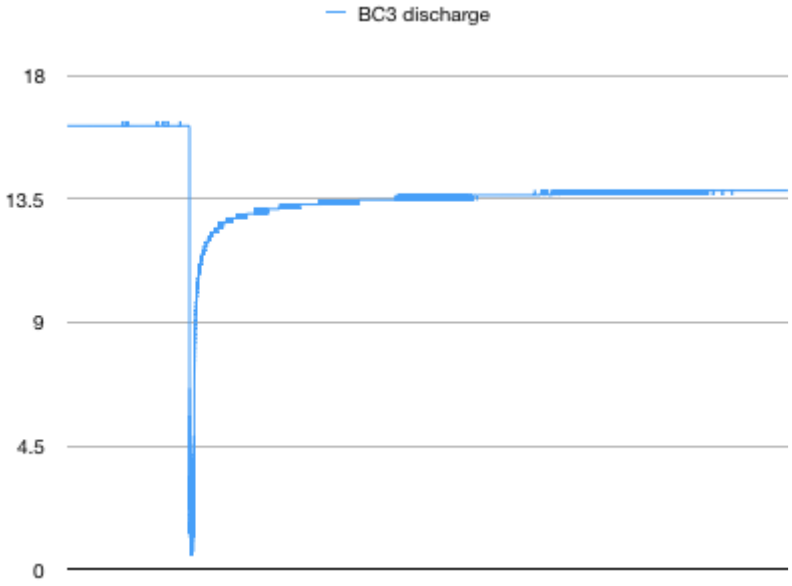


I will do a quick discharge and see if it comes back to that starting point over the following week.

2 ^ v • Reply • Share ›

gdaigle ➚ **gdaigle** • 2 years ago

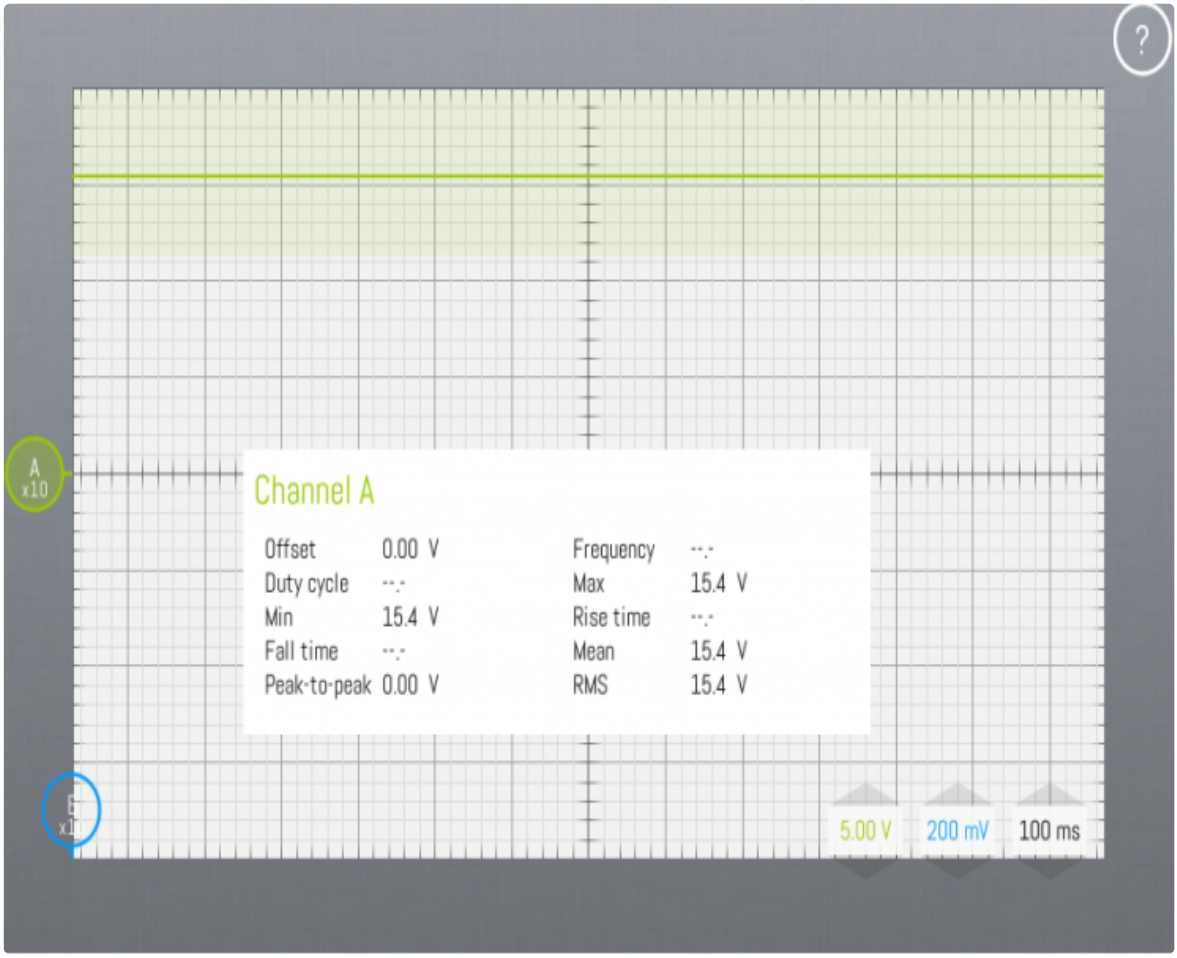
Here is the discharge of BC3. I will track it and update regularly.



2 ^ v • Reply • Share ›

gdaigle ➚ **gdaigle** • 2 years ago

24 hrs later, voltage of BC3 is 1.547V, short of original voltage 1.62V.



Reply • Share ›

Ged ➚ **gdaigle** • 2 years ago

This is an excellent idea. Can give us an idea of if the energy density is regenerating or not, which is the true heart of the claim (recharging energy for use) for if this tech works or not. Thank you for your thorough and continued work!

2 Reply • Share ›

Paul Harmans • 2 years ago

In the early days of Steorn, they absolutely were aware of the work of John Bedini and Tom Bearden, and they (Steorn) build almost the same apparatus (copper wire coils and magnets).

Maybe the following explains the Orbo effect (and yes, Bedini and Bearden had to deal with the same suffering and skepticism Rossi is facing):
http://www.energyfromthevac...

The Tom Bearden website:
http://www.cheniere.org

1 Reply • Share ›

Zephir ➚ **Paul Harmans** • 2 years ago

IMO Steorn Orbo-Cube technology is most similar to these graphite/silicone-silicone carbide cells. https://www.youtube.com/cha...

1 ^ | v • Reply • Share ›

gdaigle • 2 years ago

Another interesting issue came up today. I had been isolating the leads to the blue cells using a single piece of tape to isolate the black and red leads. Apparently there was voltage leak across the leads keeping the voltage low, probably due to the chemistry of the adhesive of the tape.

The two discharges of bluecell#1 and bluecell#2 (bottom of this thread) were done right after I removed that single piece of tape across both leads of each cell. The beginning voltage for bluecell#1 was 0.476V, while bluecell#2 was 0.662V. When finished I gave each lead its own piece of tape instead of capturing both leads with a single piece of tape. I tested them again today, 14 hours after the first test. Today the voltage for bluecell#1 was 2.80V and for bluecell#2, 2.74V.

Clearly the voltage really rocketed up after the leads were properly isolated. It was inadvertent, but this apparently demonstrates the recovery of the bluecells spontaneously over less than a day. I will test the cells again tomorrow.

2 ^ | v • Reply • Share ›

Ged ➚ gdaigle • 2 years ago

Wow, didn't expect that. If they were batteries or even capacitors, that long term shorting would have done them in and there would have been no rebound to such higher levels--so perhaps there is indeed something positive going on here. These voltages are at least useful now, too.

Question is, how much energy density do they actually represent? And does that energy density regenerate?

1 ^ | v • Reply • Share ›

Andreas Moraitis ➚ Ged • 2 years ago

Energy is indeed the crucial parameter here. Measuring only the voltage is not enough. The recovery of the voltage could have unspectacular reasons – although it is remarkable that it can end up at a value that is higher than the initial one (if I understood it correctly).

Determining the released energy would probably require an expensive meter, such as the PCE-830, because of the observed ‘oscillations’.

2 ^ | v • Reply • Share ›

georgehants ➚ gdaigle • 2 years ago

Good luck Greg, always pleasant to see a genuine scientist willing to follow any possibility against the trend.
Positive or negative it is time well spent.

1 ^ | v • Reply • Share ›

Frank Acland ECW Admin ➚ gdaigle • 2 years ago

Interesting, Greg. That's pretty unusual, do you have a second meter you could use just to double check those voltage measurements?

1 · Reply · Share ›

gdaigle ➚ Frank Acland • 2 years ago

Analog, less accurate, but yes I can use it to get a ballpark reading.

3 · Reply · Share ›

Ged ➚ gdaigle • 2 years ago

That would definitely be good, just to double check as Frank said (don't need perfect accuracy right now, just within an order of 10), especially now that it seems they may indeed actually work.

1 · Reply · Share ›

CWatters • 2 years ago

I understand that before Steorn closed a complaint was made to the Advertising Standards Authority for Ireland. They asked Steorn to justify the claims Steorn made in the advert on their Facebook page about Orbo. According to the ruling Steorn never provided any evidence in support of their claims to the ASAI and the complaint was upheld by default.

Reply · Share ›

nietsnie • 2 years ago

Interesting! When I first read the title I was going to direct you to a story regarding NASA kidnapping children to use as Martian slaves. But - I see you're serious. In the original tests I strongly suspected that a battery was involved somehow in recharging the 'magic film' cells. Clearly, from your careful research, that was wrong.

The big question for me, then, is what the mechanism of regeneration is. My goto notion, after battery was eliminated, was then some sort of electrochemical reaction, and I still think that's a possibility. But, I admit that I know of no electrochemical technology that fits what is known about the cells and their environment - particularly over the length of time the device has been in Frank's (and your) possession.

I also think that it is premature to conclude that the cells do not harvest energy from their environment - although you have demonstrated convincingly that they don't harvest it from temperature change or power lines. Not that I have any idea what that source might be - just that I think it's important not to eliminate the potential of an unknown environmental source from our thought process.

1 · Reply · Share ›

gdaigle ➚ nietsnie • 2 years ago

Good point. It could be energy harvested from the radio/television spectrum. Re: electrochemical reactions, I can tell you that there is no gel or liquid electrolyte in the cells. There are polymer film layers and a layer of the black film, all rolled tightly. The black film flakes quite easily.

1 · Reply · Share ›

Mark ➚ gdaigle • 2 years ago

Wait...didn't Shaun say that there was some kind of "electret gel" that was causing these voltage spikes? Now you're saying that there is no gel. I wonder if Shaun was lying...

Reply • Share ›

gdaigle ➚ **Mark** • 2 years ago

Shaun has said that the "magic" film material is an electret (permanently polarized dielectric material). However, there is no gel inside the cells.

1 Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Hmmm...I could have sworn that I read somewhere that he talked about a gel...maybe I am just not remembering properly...

Reply • Share ›

TVulgaris ➚ **Mark** • 2 years ago

The gel could be polymerized to a high degree and quite strong and not even remotely liquid.

1 Reply • Share ›

Mark ➚ **TVulgaris** • 2 years ago

Good point. I didn't think about that. Maybe it was a misunderstanding on my part.

Reply • Share ›

Uwe Schneider • 2 years ago

Nice Report, Thanks.

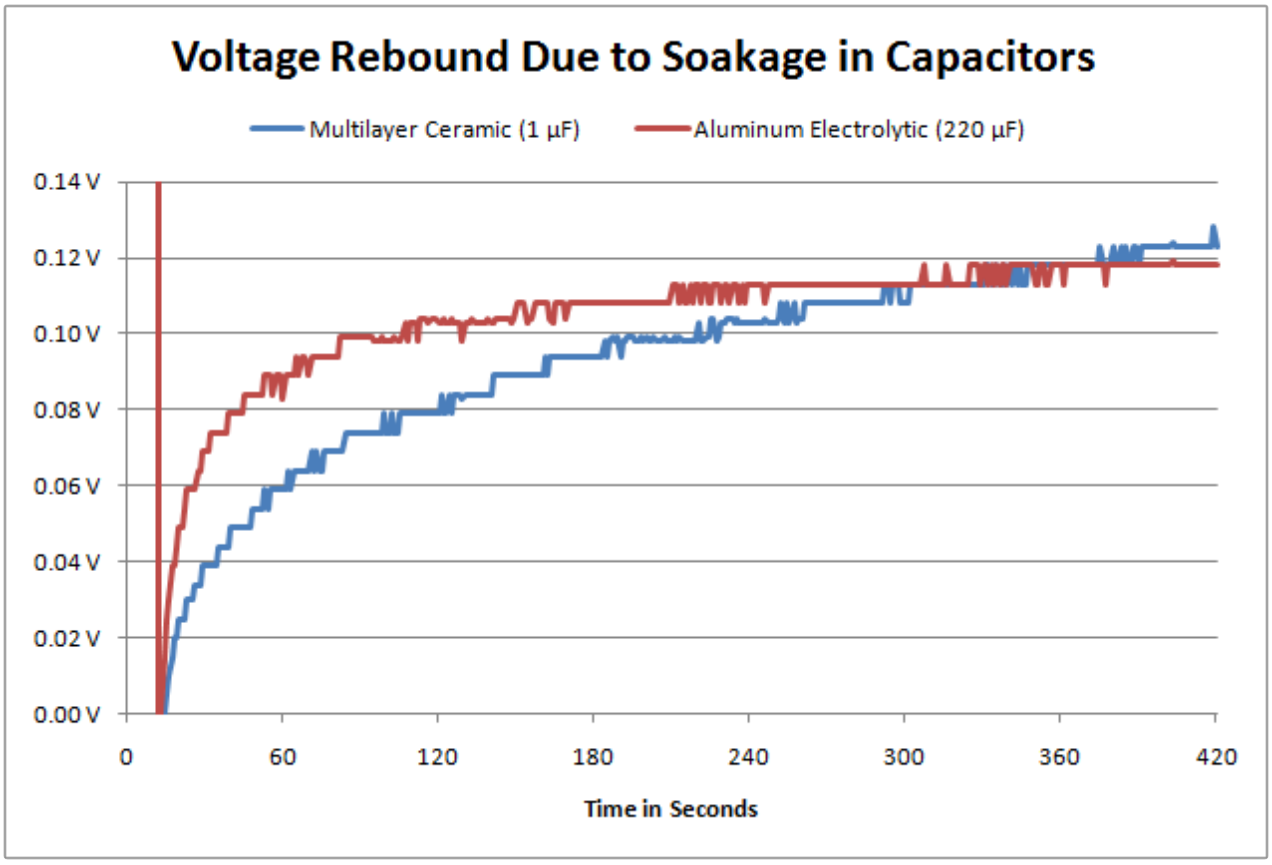
Have you considered the Dielectric Absorption as possibility for the observed Effect?

A short description is found on page 11 http://www.cde.com/catalogs...

Reply • Share ›

gdaigle ➚ **Uwe Schneider** • 2 years ago

Dielectric absorption led to other articles on voltage rebound, which certainly looks familiar. I'll continue to explore those topics.



Here is the URL for that page on voltage rebound due to soakage in capacitors.
http://www.robotroom.com/Ca...
So it seems that this rebounding is not a recharging of the capacitor, though it does appear to be pretty magical. The proof will be if, over time, the blue cell manages to recharge itself to a voltage higher than before the discharge.

2 ^ | v • Reply • Share ›

gdaigle ➚ **Uwe Schneider** • 2 years ago

Thanks. I've been looking for alternative explanations. I'll have a look.

^ | v • Reply • Share ›

This comment was deleted.

gdaigle ➚ **Guest** • 2 years ago

I was under an NDA to Steorn for about 5 years and never saw a sign of their R&D being a scam. Yes, Steorn screwed up on every single demo and product they launched, but it wasn't until Shaun McCarthy lost control of the firm that there was a move to cut and run.

So now we have a chance to test basic components of the most recent generation of their technology. Why wouldn't we?

4 ^ | v • Reply • Share ›

Zephir ➚ **gdaigle** • 2 years ago

I'm sure, that McCarthy's technology works as demonstrated - but the secretive last-minute potting of OrboCube (without subsequent QA tests) destroyed the cooling and proper function of cheap Chinese regulation circuits. The heating during epoxy/silicone polymerization could also partially destroy the (polarization of) electret cells. According to F. Ackland's observations, the polarization of cells with external battery can restore their function at least partially.

2 ^ v • Reply • Share ›

cashmemorz • 2 years ago

If, as is reported, the cells, after discharge get a charge or recharge on their own, without environmental input, then what are they made of? Related to cold fusion or LENR ,or lower than ground state orbitals(a la Randell Mills), or something else again?

By the way, I am writing directly inside the e-cat site, without resorting to another word editor, to copy and paste from into ECW. So that bug may have been eliminated via the migration to a new server. Also I had a ransom type of pop-up while in ECW, the old server, Did my best to find solutions:for that. Best one was at this site

https://www.bleepingcompute...

for that ransom thing and cleaned it. Found many files and registry settings were cleaned up..

1 ^ v • Reply • Share ›

gdaigle ➚ **cashmemorz** • 2 years ago

The composition of the "magic film" is not known, though Shaun has said it is based on materials used in super-capacitors. That still leaves a lot of possibilities open. If a pseudocapacitor it could use transition-metal oxides like RuO2, IrO2, or MnO2. If a double-layer capacitor it could use carbon or graphitic carbon. If a hybrid capacitor it could use lithium salts. Carbon nanotubes might also be employed.

I had considered having a sample sent to a mass spec, but thought it too invasive of Shaun's IP. So we'll have to wait until any patents on this are made public.

3 ^ v • Reply • Share ›

Zephir ➚ **gdaigle** • 2 years ago

My guess it's mixture of rather common electret wax and graphite flakes. Maybe the pyrolytic carbon dust used in supercapacitors has been actually used. You can see the main component of it here

https://www.reddit.com/r/Ph... https://www.reddit.com/r/Ph...

You may imagine the spaces between graphite layers like the tiny diodes, which rectify the thermal voltage fluctuations. IMO Steorn Orbo-Cube technology is most similar to these graphite/silicone-silicone carbide cells. https://www.youtube.com/cha...

Reply • Share ›

Omega Z ➚ gdaigle • 2 years ago

I read somewhere that the primary investor took all the IP and parted ways with Shaun. (A disagreement on how to proceed among them.)

I would speculate that maybe the investor intended to take the IP and colaborate with other entities in R&D as this was definately not ready for market. From your report, it appears at the very least, there was a quality control issue and possibly not having the science nailed down on exactly what is taking place.

1 Reply • Share ›

Mark ➚ gdaigle • 2 years ago

IP? They went under. Is there still some kind of legal trouble that you could get into if you made the "magic film" recipe public?

Reply • Share ›

gdaigle ➚ Mark • 2 years ago

I can't recall where I heard this, but I believe that despite a struggle for the IP in December, Shaun still holds the IP on the magic film.

3 Reply • Share ›

Zephir ➚ **gdaigle** • 2 years ago

You should at least analyze the metals used as a conductive electrodes of the film. Shaun at his video claims, that a pair of different metals has been used.

^ v • Reply • Share ›

Mark ➚ **gdaigle** • 2 years ago

Darn...I sure hope that we can get it out, at some point. This is too important to be held back by this kind of IP stuff.

^ v • Reply • Share ›

Mark • 2 years ago

Oh, wow! Thanks a lot for doing this, man. I was hoping that someone would try to figure out more about how those Orbo Power Packs worked. I was getting frustrated that no one seemed to want to try to figure out more about it now that they went under - probably because most think that the whole thing was a scam. I ain't no expert, but that report is coming to mind, from late last year, of those two, probably mainstream, scientists who said that they found a loophole in The Second Law Of Thermodynamics. I don't know if that has anything to do with this, but, just in case it does, I'll post the link:

http://www.anl.gov/articles...

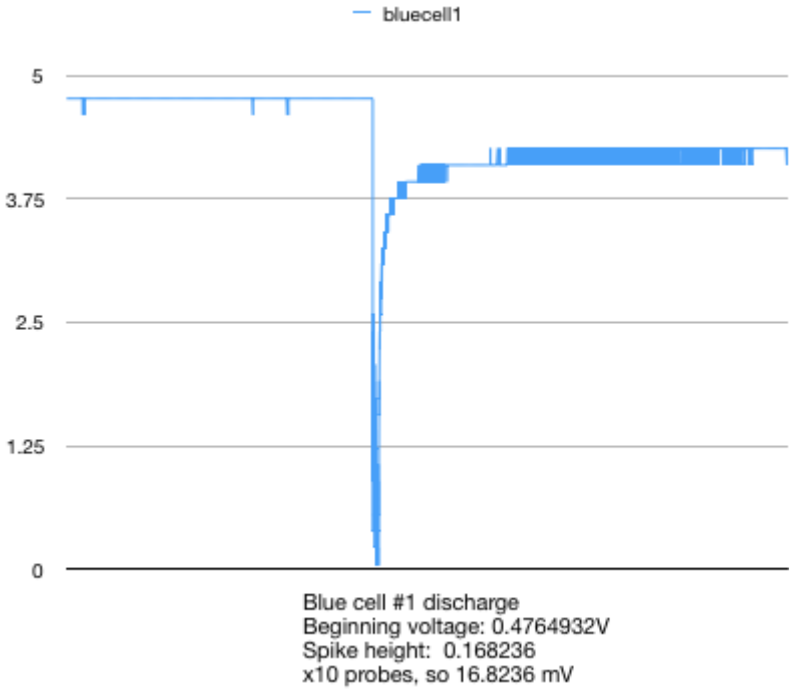
I think that it is very interesting that you think that it is not harvesting energy. I hope that you can figure out what that "electret gel" is. It would be great if that information could get into the public domain. I wish you the best of luck, and I REALLY hope that you are successful.

2 ^ v • Reply • Share ›

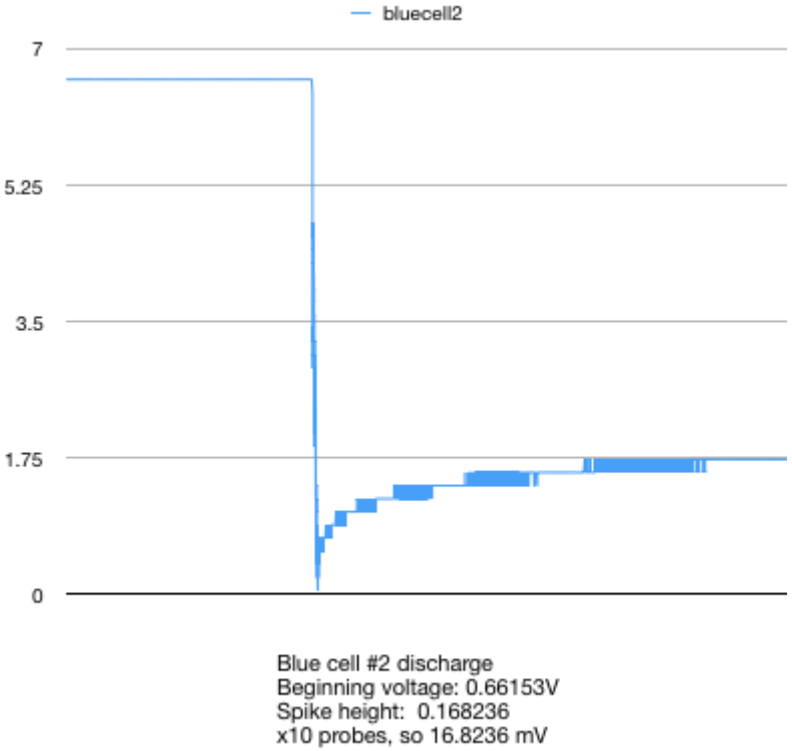
gdaigle • 2 years ago

I mentioned in the report that differences in the blue cells may also have contributed to the unreliable results of the O-Cube as a whole. Here are two discharges done yesterday of blue cells #1 and #2. Just a reminder that I was using x10 setting for probes, so the voltages on the charts are 10 times higher than actual.

In #1 the recovery is very rapid and high.



In #2 (which starts at a higher voltage) the recover is very low.



3 · Reply · Share ›

Ged → **gdaigle** · 2 years ago

Fascinating. Thanks so much for your work on this. Finally we are getting some answers to the big questions we had. We had a bunch of random theories on how it could work of it did, but I can't even recall them anymore (well, somewhat--about cascading dipoles alignments and energy harvested from creating entopic disorder by misaligning then at discharge, and regenerated by reordering of them from the Earth's field or something). Guess we'll see if it does indeed rebound at least to start over time with more testing.

The difference between the two definitely suggests very high manufacturing defect rates in their production. That would sink any business, so no surprise it got them in the end. That's too bad.

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gdaigle • 2 years ago

Hi Frank. Thanks for posting. The pdf looks good, but comes up twice, so you can remove the second one.

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