DEVELOPMENTS UPDATE

What follows is a summary of the main data, evidence and developments in recent months to give a general picture regarding measurements focused on power rather than battery voltage performance, as used in the previous CoP tests, and reported in the replication manual.

The aim of these tests is to see if the device can sustain itself (self-run), with or without an additional external load.

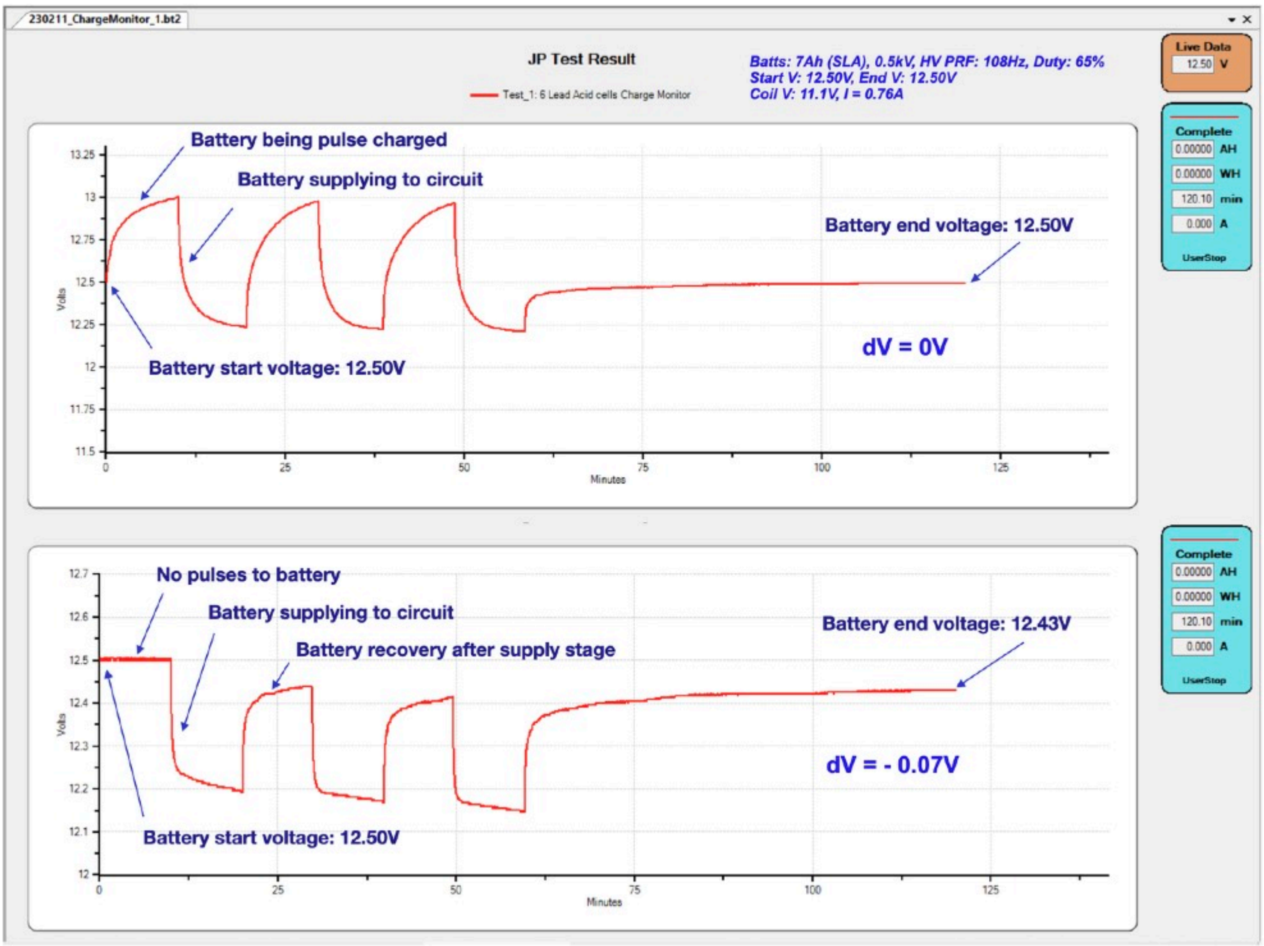


Fig 1: HV charging and swapping

Looking at the first graphic (Fig 1), the setup here is with HV pulses going directly to the receiving battery and the supply and receiving battery being automatically swapped every 10mins (positive line swapping). The battery being monitored by the computerised battery analyser (CBA) is battery 2.

The top part of the graphic shows battery 2 being charged initially for 10mins before then becoming the supply battery. The swap cycle was repeated three times and then the device turned off. As annotated, when battery 2 becomes the supply, with each cycle, its voltage drops a little lower under load, and also when being pulse charged, it does not quite reach back up to where it was on the previous swap cycle. However, when switched off and allow to recover, the battery ends up at the original starting voltage which suggests that there is some ‘compensating’ energy influx to offset the inevitable losses in the circuit.

The lower half of this graphic shows what happens when the same process and cycles are used, but during the charging phases, the pulses are turned off. So battery 2 being monitored is showing the supply stages, as before, but this time there are no pulses being received to provide charging. This then is like a control experiment and the resulting overall small voltage drop suggests that the pulses are in fact making a difference.

The second graphic (Fig 2) brings together two plots and shows a similar outcome. The red line is with the HV pulses being applied and the green line with no pulses during the charging phases. My interpretation of this is that, since the red plot shows the resulting voltage drop after testing is zero, then it is reasonable to conclude that any energy influx occurring during the charging phases is enough to offset the power draw during the supply stages, calculated to be 9.5W.

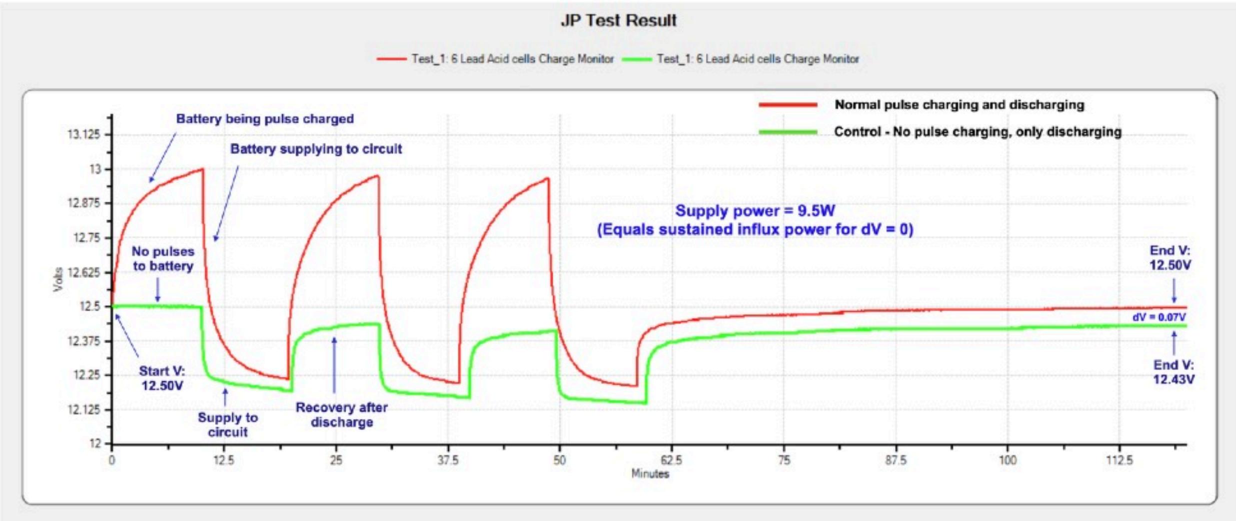


Fig 2: HV charging and swapping with Control

So this is good evidence that something is happening but it is not a strong enough effect yet to match the projected outcomes of Bedini and others regarding charging voltages in particular. In particular, since the charging voltages reached are not upwards of 16V, then the ideal finishing point ,where all possible chemistry changes have taken place, has not been reached and so this dV=0V point must be seen as an intermediary and temporary ‘working’ reference point.

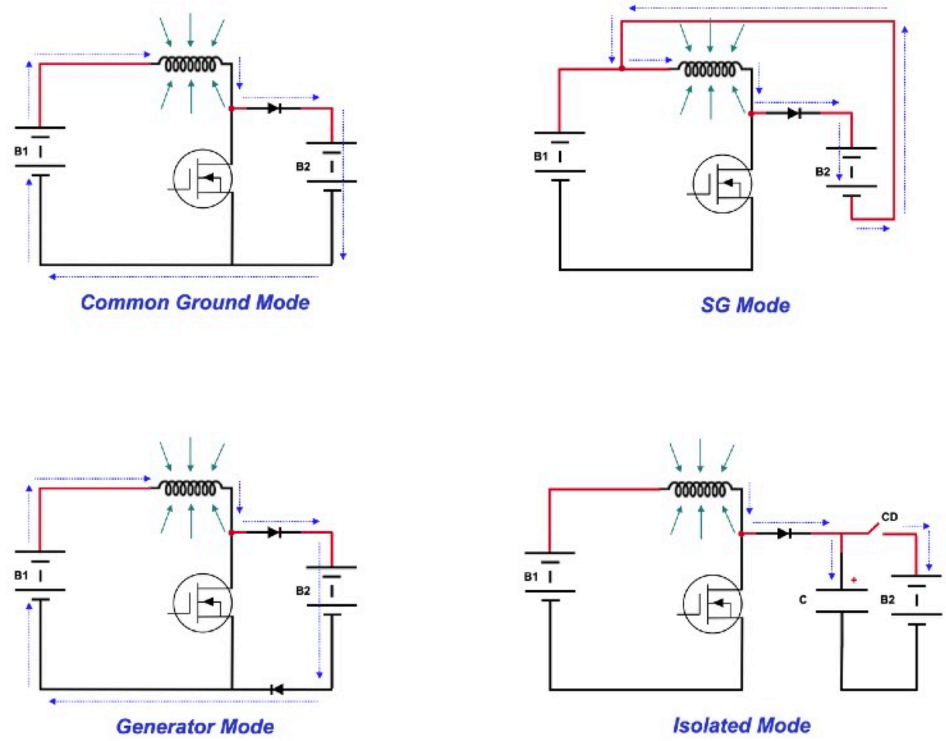


Fig 3: Different wiring modes

One of the more promising results was when exploring the use of the 'Classic SG' wiring mode, compared to the 'common earth' mode used so far. The v4 PCB was modified to allow switching between 'common earth', 'SG' and 'Generator' mode, which is the same as 'common earth' except for the inclusion of an additional 'Generator' diode and an 'isolated' option, yet to be tested (see Fig 3).

The effect of operating in SG mode is that the supply current demand reduced to 20% of the 'Common Earth' demand. This allowed the charging effect to be more pronounced, especially when, as a consequence of the 'SG' mode, the monitored voltage was the combined value of both batteries and not just battery 2.

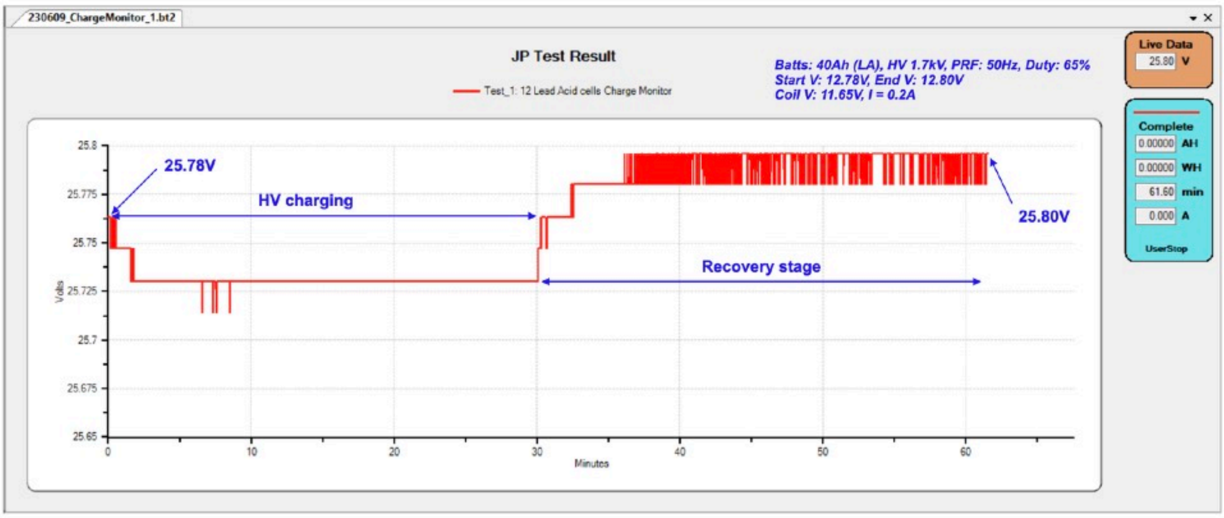


Fig 4: HV charging and swapping - combined voltage

While the voltage combination can be seen on the recording spreadsheet, its live value makes it more obvious, as Fig 4 shows. Here, during the charging phases the combined voltage initially drops a little, as expected, but then remains stable over the charging period of 30mins. After switch off, not only does the battery voltage recover to its starting value but rises upwards beyond it. While these are small voltages relevant to a 40Ah car battery, the effect is clear - the system is displaying a net ‘self-run’ capability with a power demand of around 2-3W. Again, small but hinting at larger possibilities.

When it comes to using a cap dump circuit, the results have so far been less positive. Fig 5 shows six swap cycles of 3min each using 53mF (53,000μF) storage caps producing discharges (CDF) at a frequency of 0.47Hz. As you can see there is a gradual reduction in the voltage of battery 2, in that it does not receive enough input during its charging phase to offset its output during its supply stages.

The cap dump unit used here is a ‘high-sided’ one, switching the positive line to the receiving battery and this was designed to tie in with the battery swapper that swaps the positive line, leaving the negatives as a common ground. On the basis that the cap dump unit is ‘converting’ radiant energy into more conventional charge, then battery swapping should be an acceptable mechanism in this context, contrary to its use with HV pulse charging.

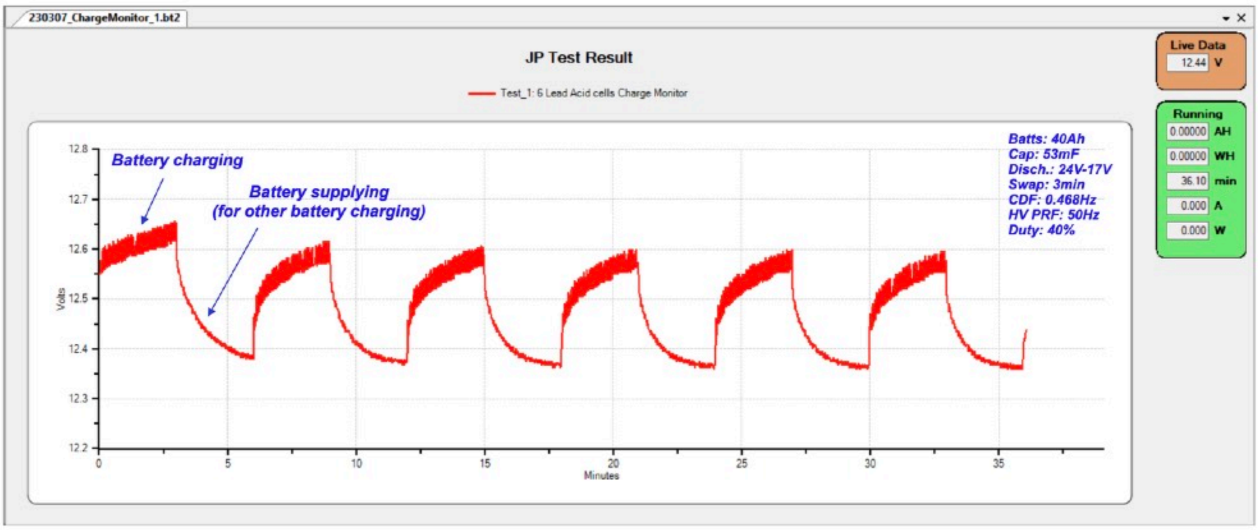


Fig 5: Cap Dump charging with swapping

So this I see as evidence that overall minimal ‘radiant’ effects are occurring when using the cap dump circuit, accepting the fact that the capacitive discharge circuit’s role is to convert ‘cold’ electricity into ‘hot’ electricity.

Calculations from the scope pulses show an overall efficiency of approaching 60% (supply to battery), so any energy influx that might be occurring in and around the coil

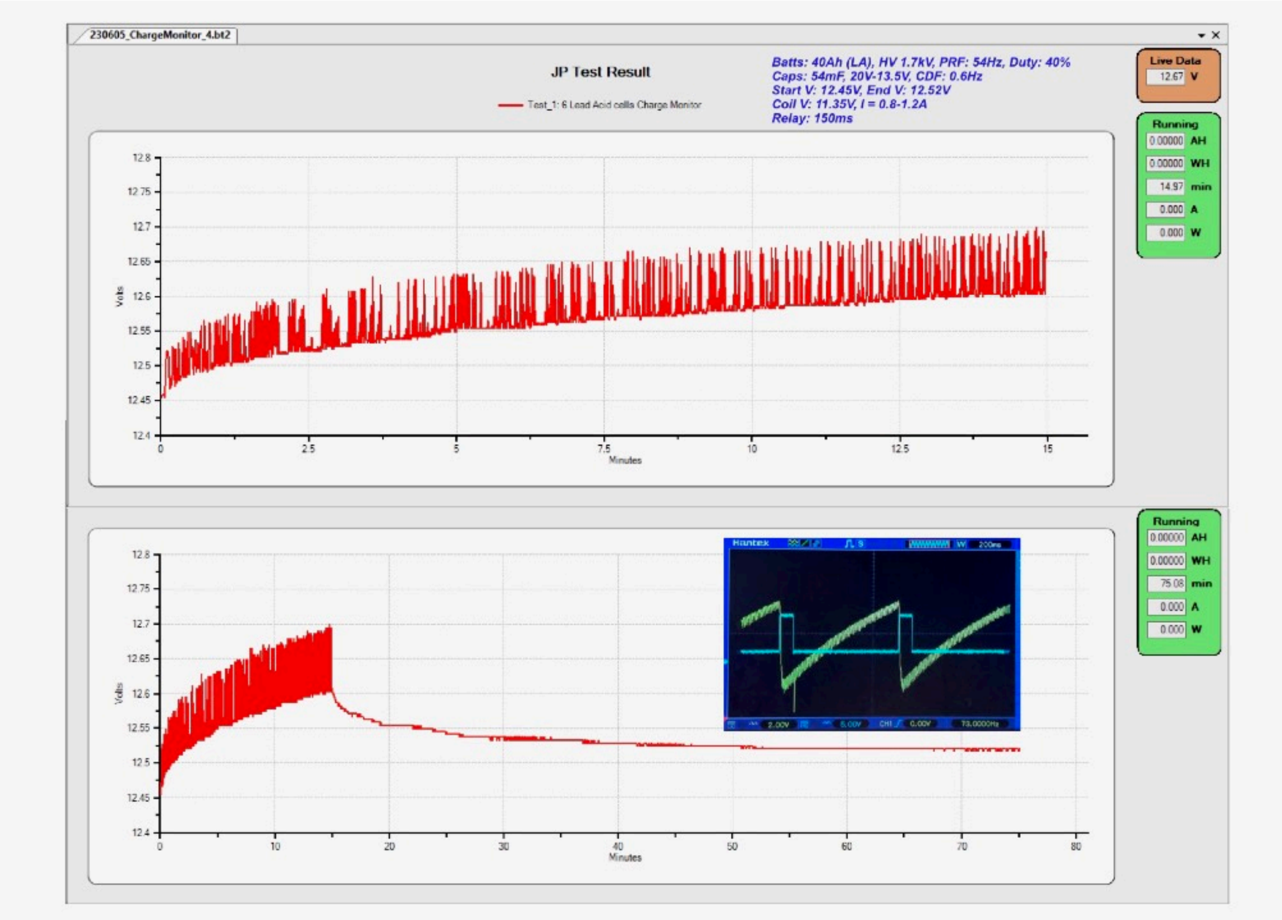


Fig 6: HV and Cap Dump Pulse Combining

and the capacitors is likely hiding in plain sight, masked by the losses. There is probably a small component from the proposed 'electret' effect but not enough to 'self-run' when including the losses from converting the generator supply to HV pulses and then the capacitor energy transfer to the battery, which can be expected to follow conventional I^2R losses.

Another recent experiment has been to included the use of pulse combining where a capacitor discharge is accompanied by a short burst of HV pulses (Fig 6). This required a dedicated additional relay system and where the start of the capacitor discharge triggers an electromechanical relay to route the HV pulses away from the capacitors to the battery for a timed duration. The included scope trace in Fig 6 shows the divert relay starting at the capacitor discharge and lasting for about 100ms before it switches back to charging the capacitors. Any benefits here have to be weighed against the slower discharge frequency, since for the duration of the relay operation the HV pulses are not charging the capacitors. The results so far are only marginally better than with discharges only. However, once clear radiant effects are observed, then this may take on a much larger significance.

Overall, I would say the evidence for 'radiant' effects so far is mixed but indicates promise. Also, one must bear in mind that Bedini did not advocate battery swapping using HV pulses and that once a battery had been exposed to radiant energy, he reported that its use as a supply source would often damage components. However, Babcock uses a 3min swapping process with his system, keeping his two batteries in what he refers to as an ‘entropy free’ state, and he states that he extracts 250W of useful energy from his rotor. Perhaps this issue is a matter of degree and the balancing of various competing factors and that finding what works is a delicate balance. The fact that my HV swapping events do not destroy any components might be seen as additional evidence that radiant energy effects, while being weak or hinted at, are not strongly present at the moment.

Since I came to this research from a different direction than many, via a more ‘Adams motor’ style device that incorporates many Bedini elements, and have never built an original SG or SSG device, I am going to undertake some retro steps to find the ‘pinch’ point. The logic for doing this is sound. If all the developments of my present system, such as kVs up to 4.5kV, variable PRF, ferrite cores and other adjustable parameters, are not enough to elicit pronounced ‘radiant’ effects, then clearly there are one or more factors preventing it. It makes sense then to revisit the ‘basic’ design, where such effects have been reliably reported, and replicate those, and then to incrementally add in the other factors and modifications to see at what point the desired effects cease. That will reveal the critical factor or factors required, whether it is a specific coil impedance, active device characteristics etc. Once that is established then it will be relatively straightforward to build on those factors and avoid the negating ones.

With my setup this is easy to do by disconnecting four of the 5 coils, winding and replacing a single new one with a trigger and power winding, and replacing the cap dump circuit with a Bedini SG board, and where the present V4 board will serve simply to provide the supply voltage for the new BD1 board. This approach means that the setup can be quickly revised and adapted with no irreversible changes.

Based on the above summary, the next development and testing stages are:

1. Deploying a ‘low sided’ cap dump unit, in place of the current ‘high sided’, one to observe the results in SG mode.

2. Converting to an original ‘SG’ device with one coil, and with options for several transistor types and output diodes.

3. Development of a combined ‘SG’ and ‘low-sided’ cap dump circuit that can be expanded to use up to 5 coils

4. Development of a induction based rotor energy extraction system

Fig 7 shows the new boards for points 1 and 2 above and Figs 8 and 9 a rotor energy extraction system.

Here a series of Neodymium magnets, with alternating poles, are attached to the top of the rotor and a hand held stator comprises a series of tweet speaker coils that give an AC output of around 5-6V (pk-pk). This will be rectified and smoothed and should be enough to drive a high power LED.

Early tests showed that the rotor speed is not reduced noticeably using this and so a more powerful extraction system could be employed, but this will require mechanical coupling to an external generator of suitable size and drag.

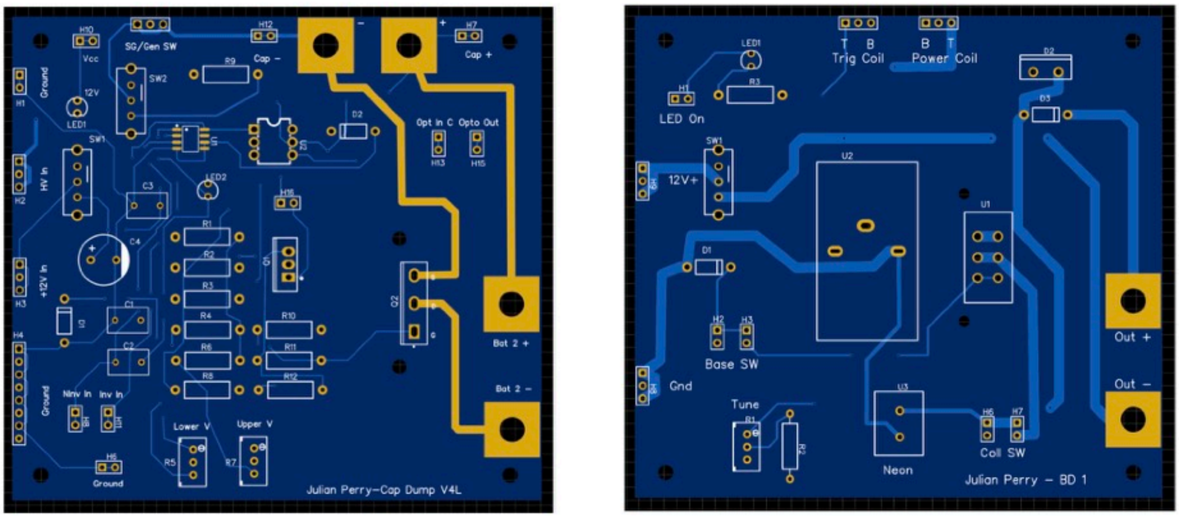
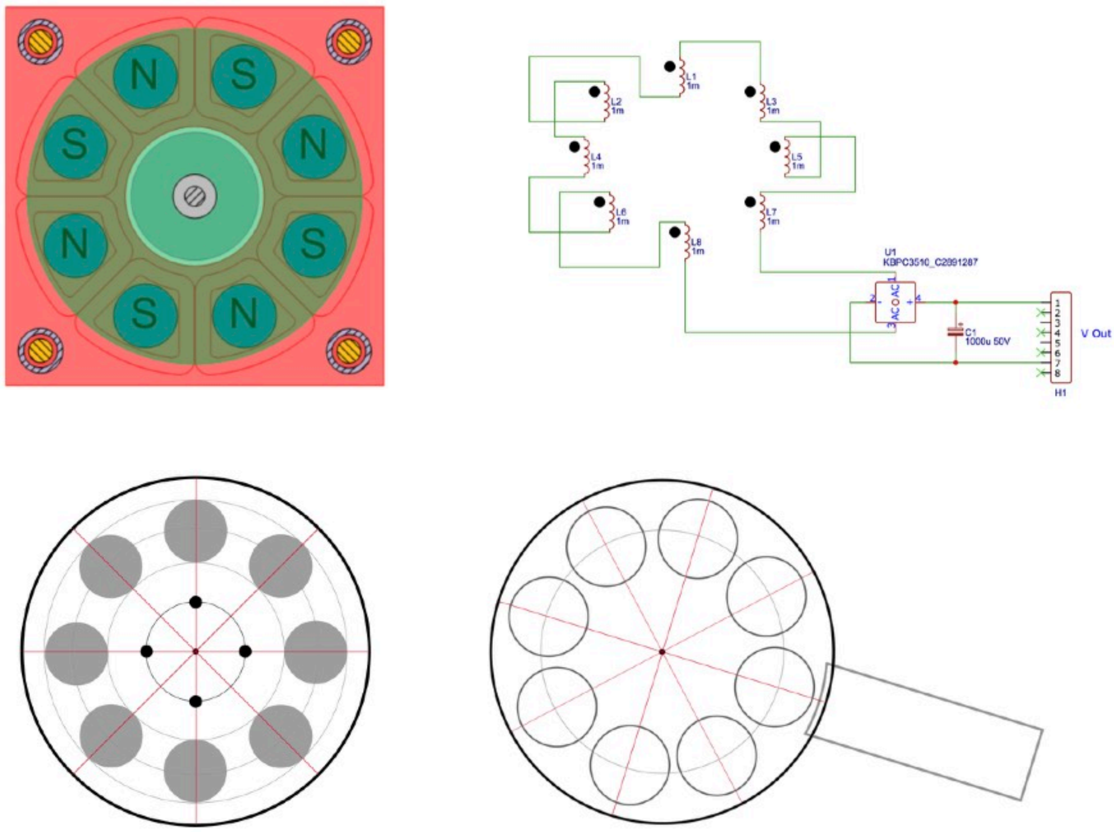


Fig 7: New Bedini and LS Cap Dump boards

Calculations for this type of device form part of the total power output of a device and are included in a forthcoming document regarding how to calculate the total power and CoP of your device. While in the past a dynamometer has been proposed for the rotor, it can also be done by calculation with just a cheap tachometer and a couple of static rotor measurements and this will be laid out in detail.

A particular point of interest is that those who have observed radiant charging report that the receiving battery will easily reach voltages topping out at about 16.5V. The fact that mine have so far never gone above 13V suggests that I'm not yet 'fishing in the deep pool'. The prospect of reaching these higher voltages suggests that the presently used Nernst equation, which derives the cell potential as a function of the electrochemistry and internal energetics, does not include factors related to radiant charging (hardly surprising) and so, in the fullness of time, will need to be revised.

The Nernst equation derives a cell potential of 2.12V/cell, and so a resting full charge voltage of about 12.65V, independent of any commercial motivations with regard to undercharging a battery to shorten its potential lifespan. Of course, in practice the charging voltage needs to be above this to drive the chemistry forward in a reasonable time, but the ability of a battery to sit at around 16-17V, even if only for a day, suggests



Rotor with Neo magnets

Handheld Stator with Coils

Fig 8: Rotor energy extraction designs

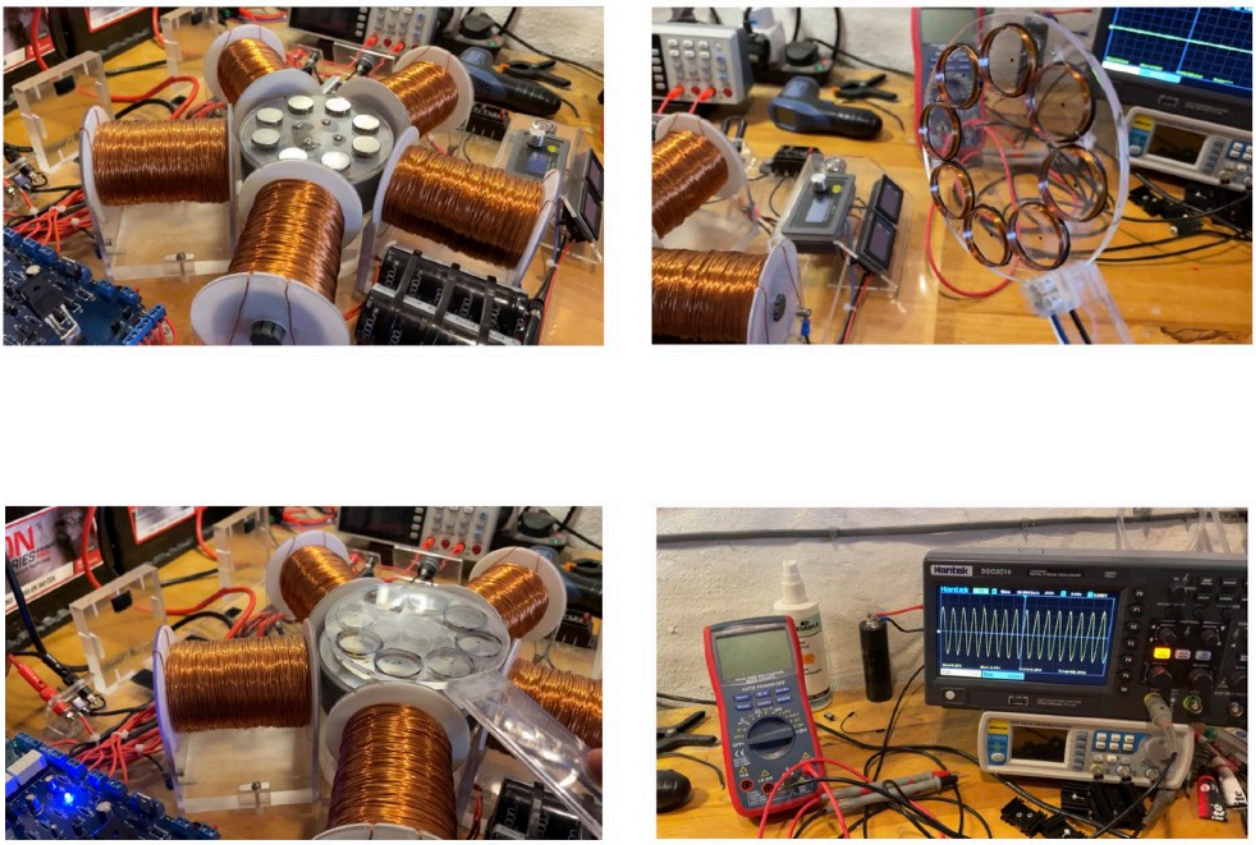


Fig 9: Rotor energy extraction

significant modifications to the description of the thermodynamics and energetics involved.

My recent and developing work with a third party company, with whom I have signed an NDA, that has been ‘deep sea fishing’ for many years now, gives me hope that I will get to that stage in the near future. I will chart the journey and, as with the first replication manual I completed earlier this year, I will update it with material making it possible for others to achieve the same, while at the same time not infringing on their specific intellectual property for their patented applications. With the ‘zero carbon’ green agenda building pace, such patents will make an enormous difference and are keenly sought technologies by those who have a large stake in lead based battery and power management systems.

As mentioned above, another document I am preparing will describe how to measure the various outputs from a device, including the receiving battery, any rotor and energy extraction system, and the cap dump unit. Peter Lindemann and Aaron Murakami’s SG-2 book addresses this issue but I feel more detail would be helpful, and with examples, especially around the main component of the receiving battery.

I quite understand why others will want to wait until there are clear positive results to report and there is no need for everyone to go through all the ‘Dyson’ type failure stages too. As a scientist, who will be feeding into the mainstream peer review process, it is important for me to experience what works, what doesn’t and why; but others don’t have to.

With that in mind then, it's a game of patience and perseverance. I have spent five years on this so far (not a lot some might say) and I fully expect to spend a further equal amount of time on this; but the pace at which I am approaching the stage of ‘success’, that many are watching and waiting for, is actually accelerating, so I am increasingly optimistic.

It is quite significant that the reports I have put up on ResearchGate, the international networking site for scientists and researchers, have reached a combined 300 reads. Clearly, there are others in the wider arena who are interested and presumably await more positive results before they can afford to hoist their thoughts and opinions on a public mast.

With summers becoming hotter and hotter, some may be emboldened not to worry quite so much about what others think! ‘Publish and be dammed’ may be the order of the day.

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6th July, 2023
Kerrow Energetics