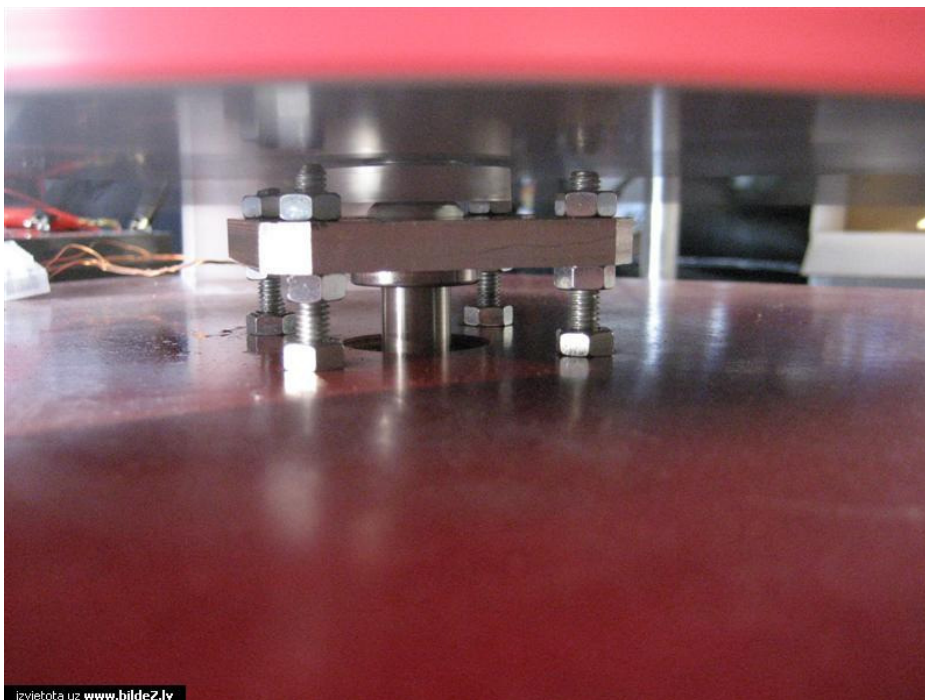
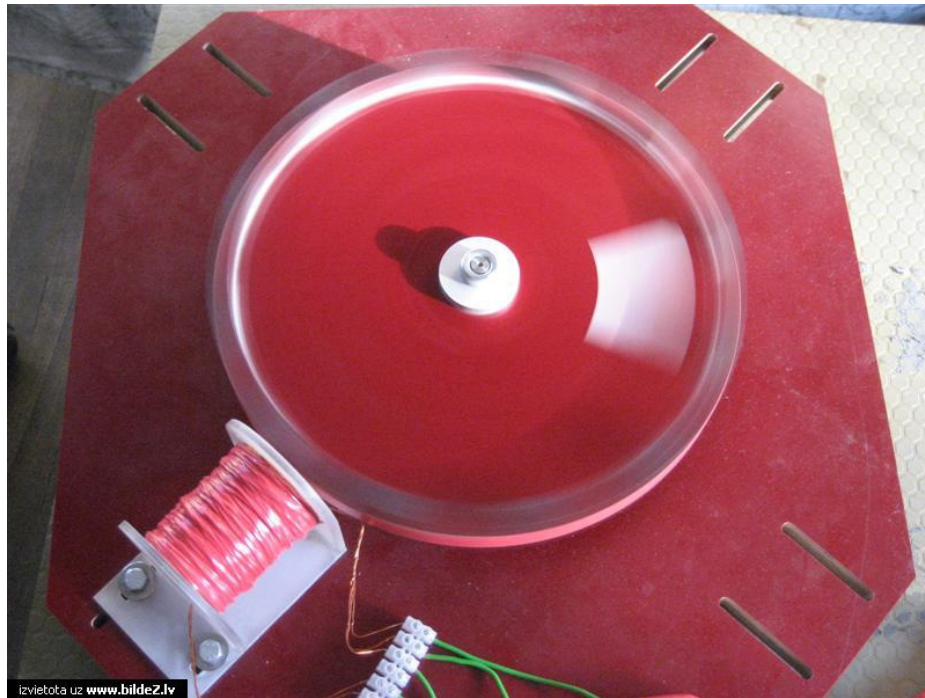


Jetijs's Load test results

Hi there. First of all my SSG details. My SSG rotor is a 18mm thick plywood piece 250mm in diameter. There are twelve 40x20x10mm ceramic magnets around the rotor. The coil is trifilar wound with gauge 24 wire, about 700 turns. I use two windings as power coil and the remaining one as the charging coil. The rotor speed is about 500RPM, consuming about 160mA of the primary battery. There are some additional holes on the base plate of the SSG to add more coils later.



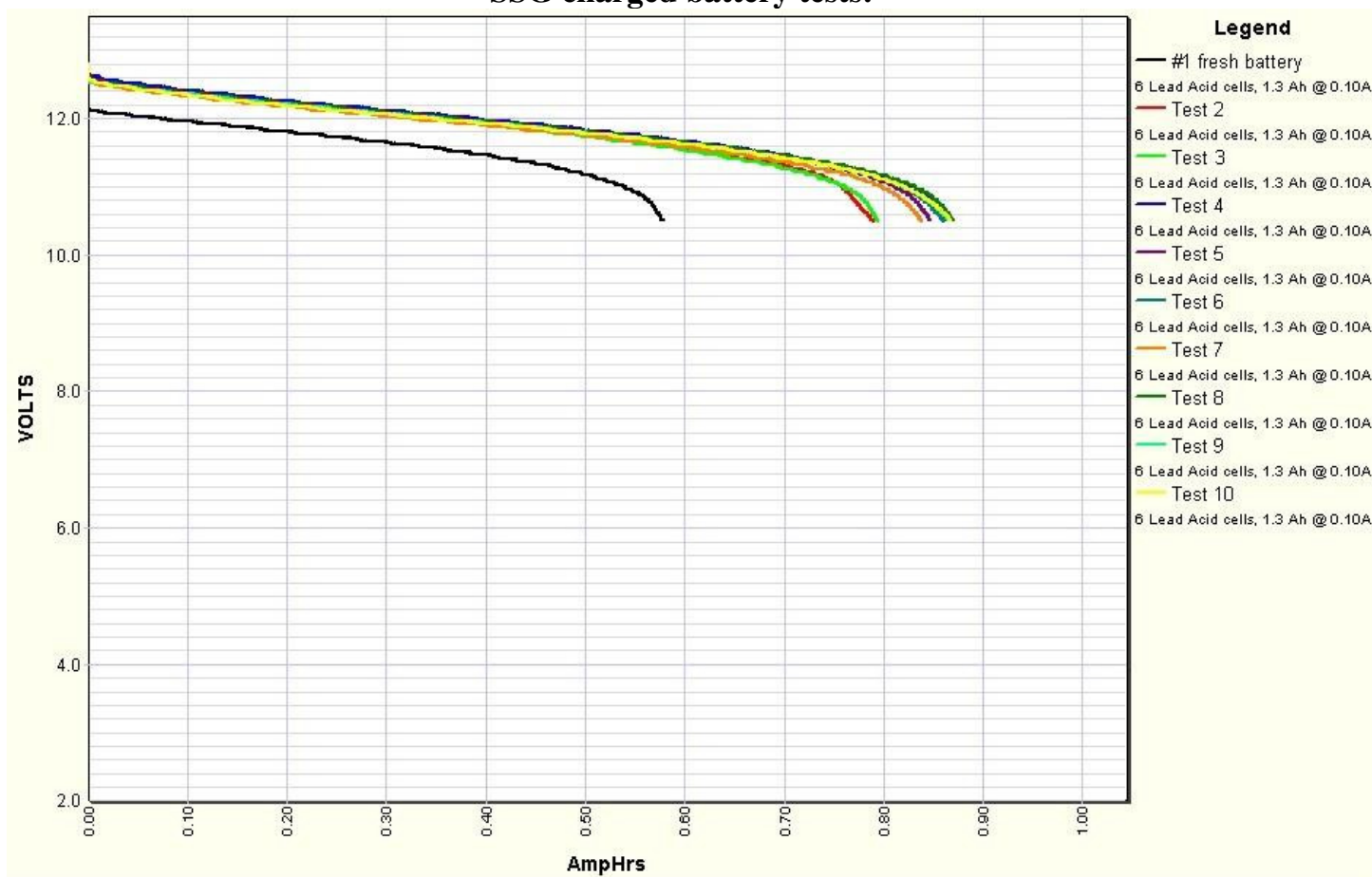
Test data

The tests were made on a new 1.3Ah sealed lead acid battery. I let the battery rest after each charging and discharging cycle for about an hour. The battery was charging on the SSG till the voltage reached 14V, then I stopped the charging process. I used the CBAII battery analyser for loading the batteries, because this device can load the battery with a steady preset current and automatically ends the loading phase when the battery voltage reaches a set cutoff voltage. Also the CBA makes some beautiful graphs while loading the batteries. You can find more about this analyser here :



http://www.westmountainradio.com/CBA_ham.htm

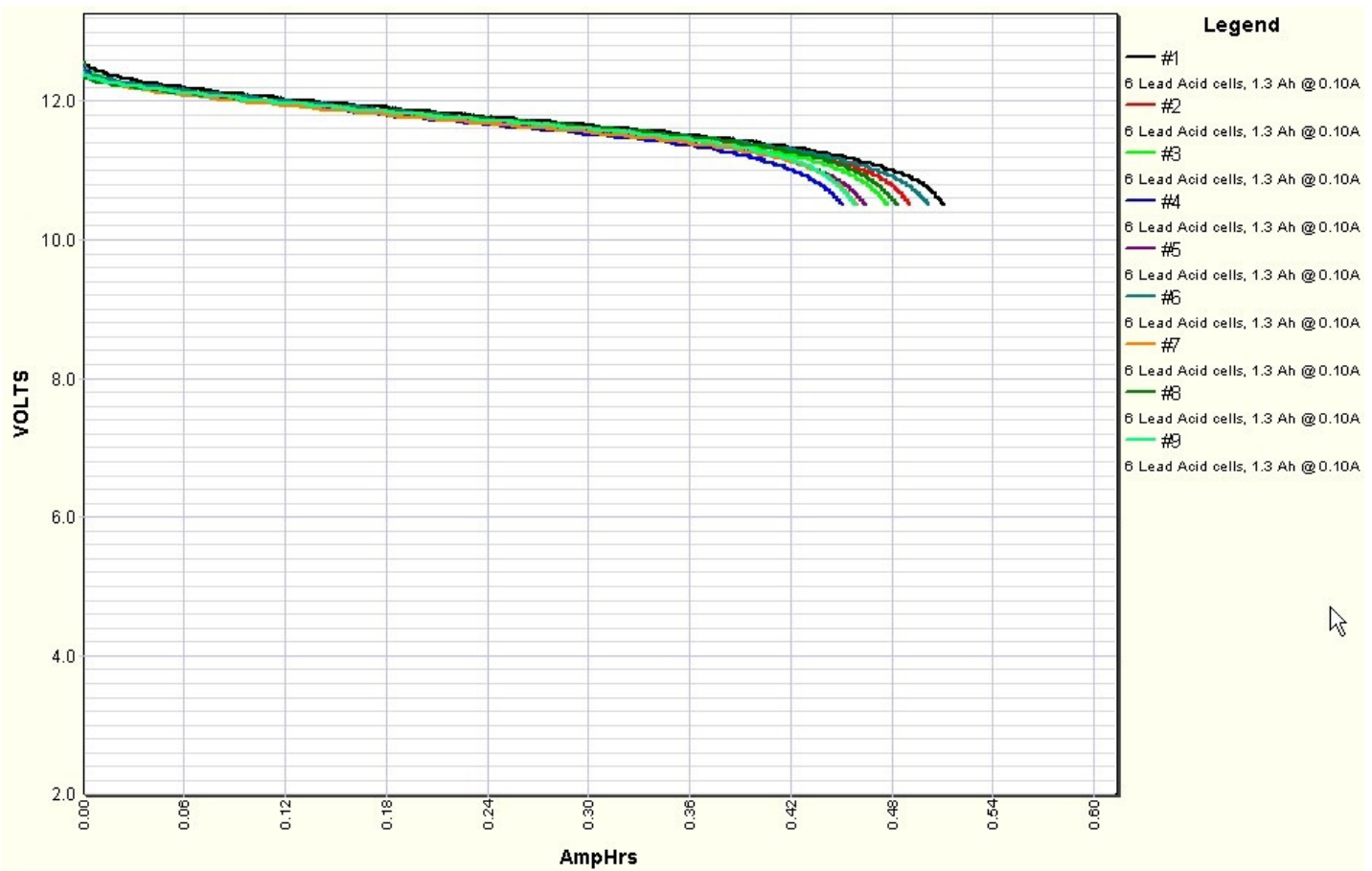
SSG charged battery tests:



# of test	Discharge rate	Starting voltage	Ending voltage	Total time	Tested capacity
Test 1	0.10A	12.23V	10.50V	5:47:01 (hh:mm:ss)	0.58 Ah
Test 2	0.10A	12.79V	10.50V	7:53:50 (hh:mm:ss)	0.79 Ah
Test 3	0.10A	12.76V	10.50V	7:56:25 (hh:mm:ss)	0.79 Ah
Test 4	0.10A	12.84V	10.50V	8:37:14 (hh:mm:ss)	0.86 Ah
Test 5	0.10A	12.82V	10.50V	8:28:22 (hh:mm:ss)	0.85 Ah
Test 6	0.10A	12.78V	10.50V	8:35:53 (hh:mm:ss)	0.86 Ah
Test 7	0.10A	12.72V	10.50V	8:22:46 (hh:mm:ss)	0.84 Ah
Test 8	0.10A	12.77V	10.50V	8:41:59 (hh:mm:ss)	0.87 Ah
Test 9	0.10A	12.74V	10.50V	8:39:25 (hh:mm:ss)	0.87 Ah
Test 10	0.10A	12.81V	10.50V	8:40:56 (hh:mm:ss)	0.87 Ah

In the graph above you can see, how the capacity of the battery slowly increases over a period of time. I loaded the batteries with a C13 rate, because this was a little faster than the C20 rate. I started the tests with a new battery right from shop. But it turned out to be a half empty battery, because the starting voltage was 12,23V. Usually when I buy a new battery, the voltage is between 12.60v and 12.80V. That is why the first test shows so little capacity. Then I recharged this battery with the SSG, it took 12 hours to charge that battery to 14V. I let the battery rest for about an hour and then started the load test. The test took almost 8 hours to complete. Again I let the battery rest and started charging with the SSG. And again the battery charged up to 14V in just 12 hours and could take the load a little bit longer. But when I started charging for the third time, the charging time increased up to 18 hours and I don't know why. The only difference from the previous two tests was that I did not disconnect the battery after loading immediately, but some hours later because I wasn't home at the time. But this should not be a problem, because the battery analyzer automatically shuts down the load when the voltage reaches a predetermined voltage. However the load time still was increasing. The next series of tests shows a bit random loading times, but there's a defiantly a trend in the increase of capacity. All the last three tests turned out very similar, the load times are basically the same. Apparently this means, that the battery has reached its peak of capacity. The calculated capacity, that the analyzer gave out does not mach the capacity on the battery (1.3Ah) But I think it's due to the C13 discharge rate. I have not tried to discharge this battery at the C20 rate.

Conventional charged battery tests



# of test	Discharge rate	Starting voltage	Ending voltage	Total time	Tested capacity
Test 1	0.10A	12.62V	10.50V	5:06:36 (hh:mm:ss)	0.51 Ah
Test 2	0.10A	12.48V	10.50V	4:54:31 (hh:mm:ss)	0.49 Ah
Test 3	0.10A	12.57V	10.50V	4:46:29 (hh:mm:ss)	0.48 Ah
Test 4	0.10A	12.54V	10.50V	4:30:32 (hh:mm:ss)	0.45 Ah
Test 5	0.10A	12.49V	10.50V	4:38:54 (hh:mm:ss)	0.46Ah
Test 6	0.10A	12.50V	10.50V	5:01:05 (hh:mm:ss)	0.50 Ah
Test 7	0.10A	12.47V	10.50V	4:35:36 (hh:mm:ss)	0.46 Ah
Test 8	0.10A	12.45V	10.50V	4:50:01 (hh:mm:ss)	0.48 Ah
Test 9	0.10A	12.43V	10.50V	4:35:03 (hh:mm:ss)	0.46 Ah

For these tests I used a new battery with the same capacity as in the tests above with SSG charging. This time I also let the charger to charge the battery up to 14V, then I stop the charging process and give the battery a rest before loading. You can see, that the first load goes longer than other and gives the best capacity. I made the first four load tests in one day, each one right after another and we can clearly see, that the capacity goes down on each loading cycle. Then I let the battery rest for a day and performed the tests after this rest period. We can see, that the longer resting period lets the battery recover its capacity to some degree. After that, the results are a bit random, but we can clearly see, that no other result is as good as the first one. The charger settings were the same on each charge cycle. I will try to do more load tests for this battery charging it conventionally and see if after all this I can get the battery gain capacity using SSG charger.

Jetijs
(Gatis Arents)
September 23,
2007.