

# The Doc's Battery Test Report

Battery Details	
Brand	Powerch 800
Size	AAA AA C D 9V 6V
Type	Ni-MH Ni-Cd RAM Alkaline Titanium
Current in mAhs	800
Stated Voltage	1.5 volts 1.2 volts
Number of batteries	Single Set of 2 Set of 4
Battery Set used	Set 1
Times charged before test started	11
Charger used to charge	Rezap RBC883 Vanson Speedy Box UBA4
Time Batteries charged in charger	See UBA graph.

Test Procedures	
Spreadsheet name	Powertech800NiMH-AAA-Set1.123 (Discharge data file)
UBA file name	Powertech800NiMH-AAA-Set-11.uba (Charge file)
Select Resistance 5 or 10 ohms	5 ohms 10 ohms
Voltage cut off	3.5 volts 3.6 volts
Date of test	11/12/03

Summary of test	
Voltage	Starting voltage 5.4 volts, cut off voltage 3.6 volts
Test duration	89.55 minutes
Max Battery Temp	32.2 degrees Celsius
Min Battery Temp	29.9 degrees Celsius

## Methodology

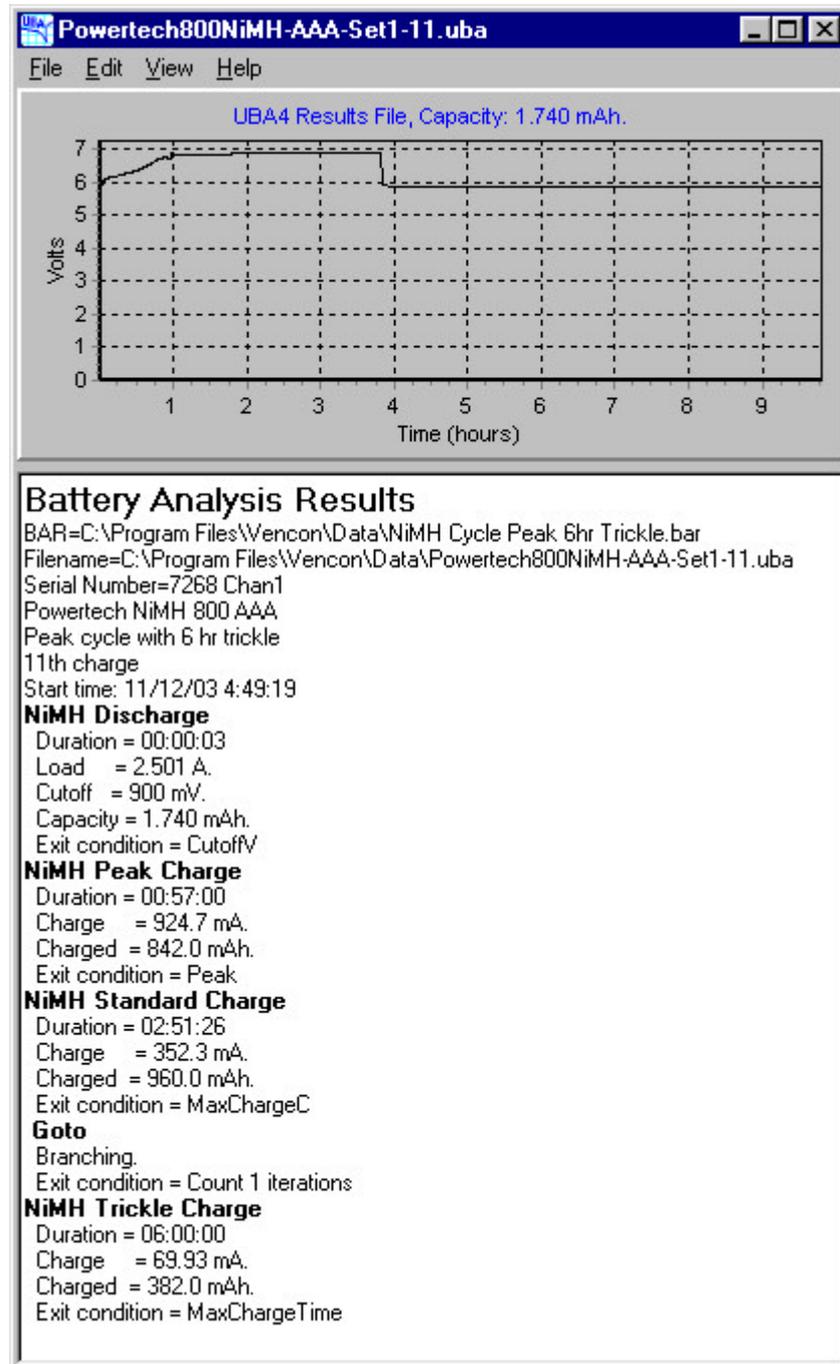
The battery set being tested has been charged at least 5 times. The battery set is charged in a Universal Battery Charger (UBA4). It is then tested under a load of 10 ohms in the scientific dooverlackie (the AA batteries are tested at 5 ohms). In this test the battery set was also charged in several different types of charger. The Doc has created a charge cycle specifically for test purposes. The UBA4 runs a peak charge cycle, once completed the battery set is automatically put on a trickle charge for 6 hours. The following pages give various data, including:

1. charging information from the UBA4;
2. a graph of the voltage during the test (cut off voltage being 3.6 volts);
3. a graph of the battery temperature during the test;
4. a graph of the battery temperature verse ambient air temperature during the test; and
5. a graph comparing the charging performance of different chargers with the Powertech 800's.

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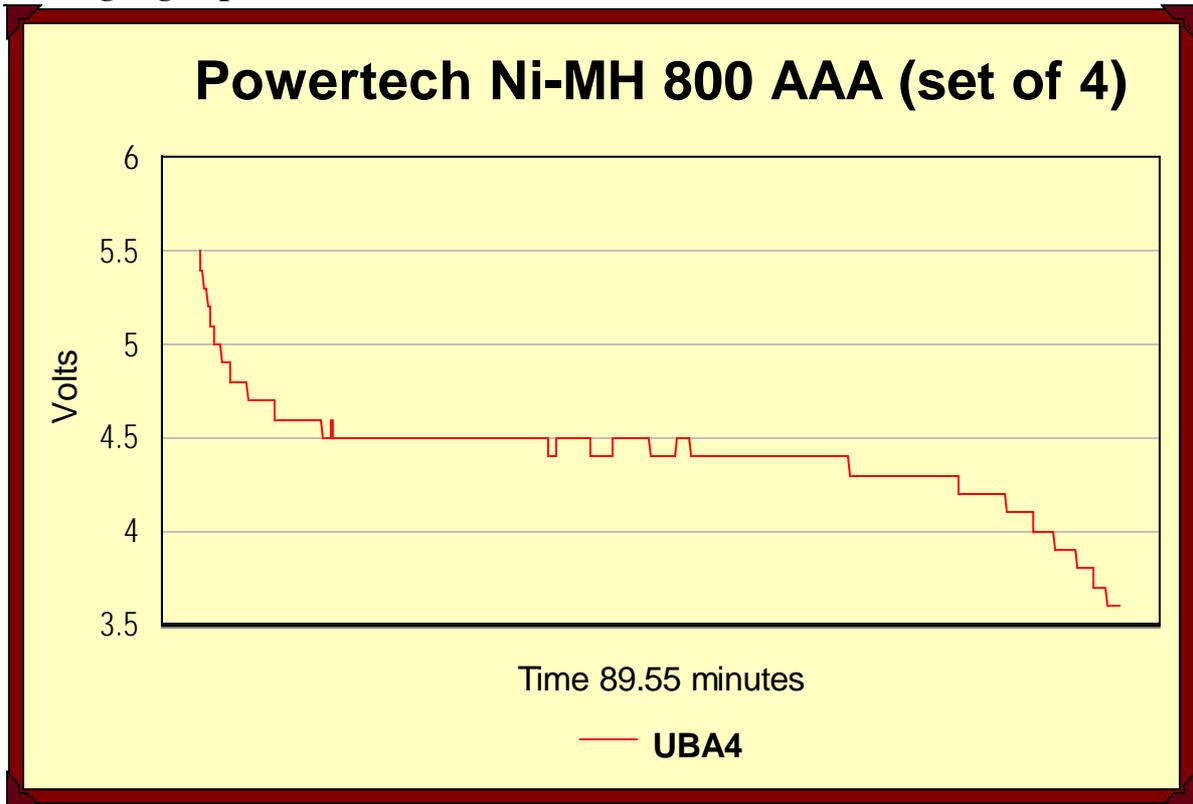
## UBA report

The graph and charging information from the UBA4.

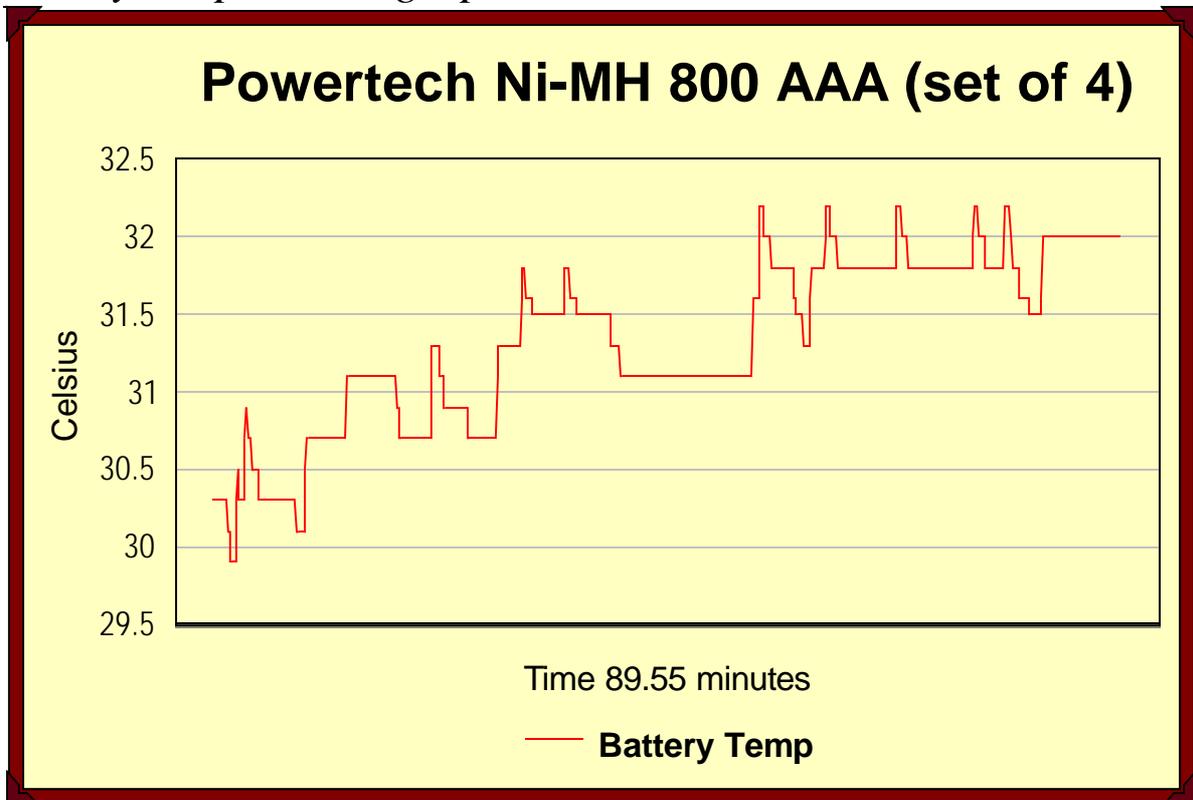


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*Voltage graph*



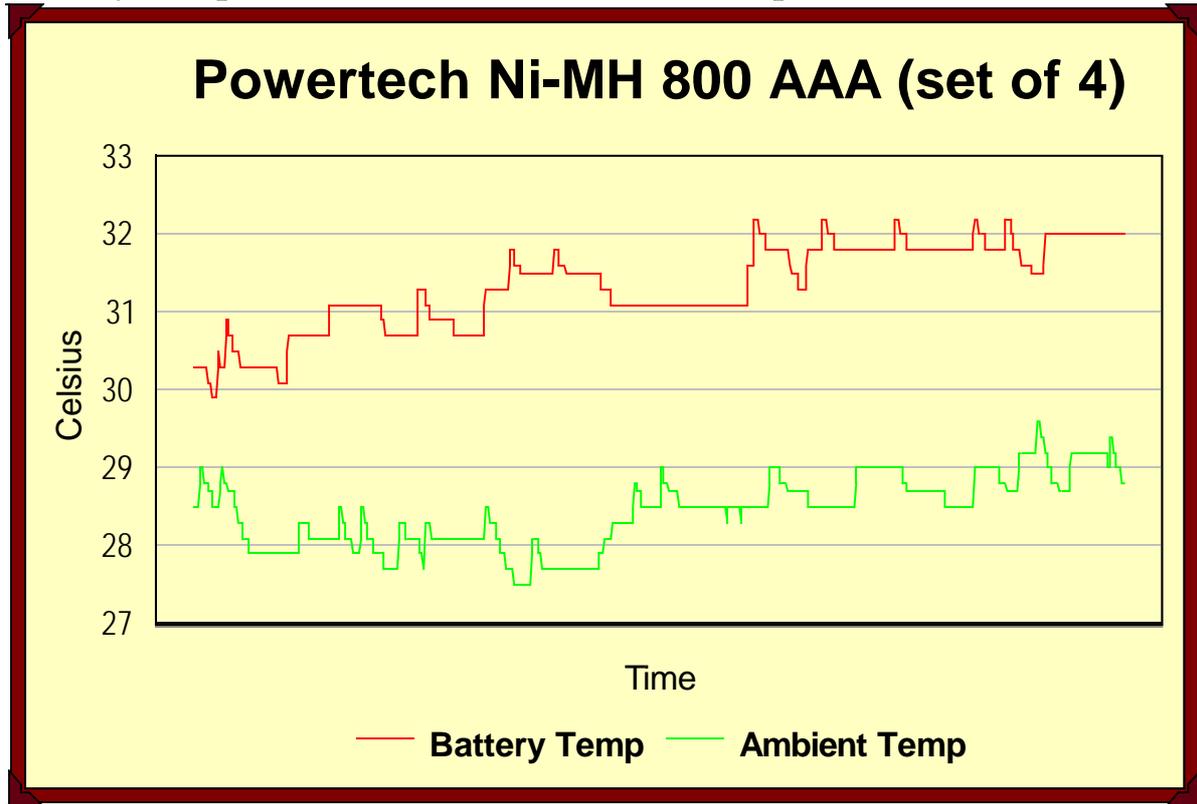
*Battery temperature graph*



With AA batteries the battery temperature rises as the battery discharges more energy. The relationship is not so clear cut with AAA batteries, probably due to the batteries being less powerful and the load being 10 ohms rather than the 5 ohms used for AA's.

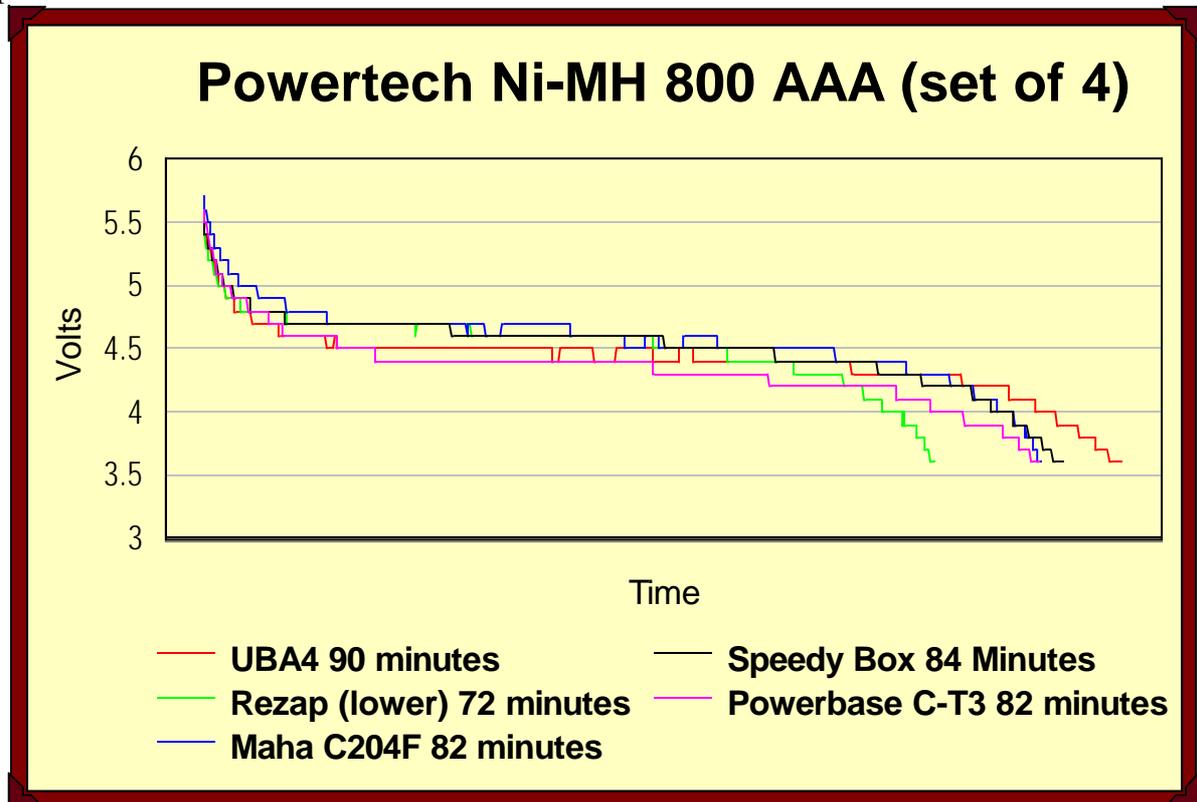
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*Battery temperature -v- Ambient air temperature*



## *Charger comparison*

The Powertech 800 battery set was then tested in various battery chargers to compare charging performance. Here are the results:



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To simplify the graph legends, The Doc has rounded the run times up to the next full minute.

The performance between the 5 chargers is more varied than with the Energiser 750 Ni-MH. While the UBA4 and Speedy Box perform well, the Maha and Rezap are not as effective. But the variation is not that great to draw any real conclusions. In these tests all chargers started at the highest voltage and went down. In contrast, the Speedy Box - when charging the Energiser 750's - started at a lower voltage then peaked and then went down like the other chargers. This peculiar behaviour does not repeat itself here. It was the Powerbase that really stood out, not because of the run time but the charge time. In less than an hour the Powerbase charged the battery set and the set ran for 82 minutes – an extraordinary performance. And the batteries remained cool during the charge.

There is little difference in build quality or performance between the Energiser 750's (Japan) and the Powertech 800's (China). In AA size batteries, the Japanese brands are of superior build quality.

## *Conclusion*

The performance of AAA's batteries is not in the same league as their bigger brother, the AA's. AAA's are used less often than AA's in both toys and high drain devices. AAA's are common in remote controls where the power demands are lower. With these less power hungry devices, the battery set is more likely to self discharge before being exhausted in use. In the Doc's view, build quality and the number of recharges are more important than raw capacity. The Powertech 800 mAh Ni-MH are a good all round performer. Neither the Energiser 750's or the Powertech 800's have a clear advantage over the other.

<b>Run Time (10 ohm)</b>	<b>89.55 minutes</b>
<b>Battery build quality</b>	<b>Good</b>
<b>Place of Origin</b>	<b>China</b>
<b>Cost (set of 4)</b>	<b>AUD\$16.00</b>

*Report date: 27 December 2003. 21 January 2004 Added data for Powerbase C-T3 charger.*

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