

Batteries

Data Sample #4																																																																																																																																																																																																																																																						
date: 1/19/91			system voltage: 12.89 volts																																																																																																																																																																																																																																																			
time: 2:25 pm			system amperage: 14 amps																																																																																																																																																																																																																																																			
			system temperature: 50° Fahrenheit																																																																																																																																																																																																																																																			
notes: 12 days after last EDTA treatment. still white precipitate on battery tops & inside cells. especially in cells of batteries 6 and 7. like a light snowfall.																																																																																																																																																																																																																																																						
<table border="1"> <thead> <tr> <th></th> <th colspan="3">battery 1</th> <th colspan="3">battery 2</th> <th colspan="3">battery 3</th> <th colspan="3">battery 4</th> </tr> <tr> <th>back row of pack</th> <th>cell 1</th> <th>cell 2</th> <th>cell 3</th> <th>cell 1</th> <th>cell 2</th> <th>cell 3</th> <th>cell 1</th> <th>cell 2</th> <th>cell 3</th> <th>cell 1</th> <th>cell 2</th> <th>cell 3</th> </tr> </thead> <tbody> <tr> <td>Absolute Cell Deviation From Pack</td> <td>2.13</td> <td>2.14</td> <td>2.13</td> <td>2.14</td> <td>2.14</td> <td>2.13</td> <td>2.13</td> <td>2.14</td> <td>2.13</td> <td>2.13</td> <td>2.14</td> <td>2.13</td> </tr> <tr> <td>Average Absolute Cell Deviation From Pack</td> <td>0.003</td> <td>0.007</td> <td>0.003</td> <td>0.007</td> <td>0.007</td> <td>0.003</td> <td>0.003</td> <td>0.007</td> <td>0.003</td> <td>0.003</td> <td>0.007</td> <td>0.003</td> </tr> <tr> <td>Absolute Cell Deviation From Battery</td> <td>0.003</td> <td>0.004</td> <td>0.003</td> <td>0.003</td> 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From Pack	0.003	0.007	0.003	0.007	0.007	0.003	0.003	0.007	0.003	0.003	0.007	0.003	Absolute Cell Deviation From Battery	0.003	0.004	0.003	0.003	0.006	0.007	0.003	0.004	0.003	0.003	0.004	0.003	Average Absolute Cell Deviation From Battery	0.003	0.007	0.003	0.003	0.003	0.007	0.003	0.007	0.003	0.003	0.007	0.003	Battery Average Cell Voltage	2.133			2.137			2.133			2.133			Battery Cell Voltage Standard Deviation	0.005			0.005			0.005			0.005			Battery Maximum Cell Voltage Difference	0.010			0.010			0.010			0.010			front row of pack	battery 5			battery 6			battery 7			battery 8				cell 1	cell 2	cell 3	cell 1	cell 2	cell 3	cell 1	cell 2	cell 3	cell 1	cell 2	cell 3	Absolute Cell Deviation From Pack	2.13	2.15	2.13	2.12	2.13	2.13	2.13	2.13	2.13	2.13	2.14	2.13	Average Absolute Cell Deviation From Pack	0.003	0.017	0.003	0.013	0.003	0.003	0.003	0.003	0.003	0.003	0.007	0.003	Absolute Cell Deviation From Battery	0.003	0.008	0.003	0.007	0.006	0.003	0.000	0.003	0.000	0.003	0.004	0.003	Average Absolute 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text to the battery's cell voltages. We want this to be as small as possible.

Seventh is the maximum voltage difference between any two cells in the battery. We want this to be as small as possible.

After giving the data and these statistics for each cell and battery, I derive six more statistical measures for the pack as a whole.

The first of these is the average voltage of all cells in the pack. I add up all the cell voltages and divide by 24.

Second is the standard deviation of cell voltages. This is figured by applying the standard deviation formula you'll find in any statistics text to the pack's cell voltages. We want this to be as small as possible.

Third is the maximum voltage difference between any two cells in the pack. We want this to be as small as possible.

Fourth is the maximum voltage difference between the average voltage of all cells in the pack and any individual cell. We want this to be as small as possible.

Fifth is the maximum voltage difference between the average voltage of all cells in the pack and the average cell voltage of any battery. We want this to be as small as possible.

Sixth is the average voltage difference between batteries and the entire pack. We want this to be as small as possible.

On the second and fourth samples, I show the percent of change in each of the last five pack statistical measures since the first sample.

Some Interpretation

What we want to see is the cell voltages coming closer together. We want most of the statistical measures to approach zero.

This is what has been happening. By the fourth sample, the data seems significant. The changes in the last five pack statistical measures range from 29 to 74 percent. They are going in the right direction -- down.

I am a very happy puppy so far. I shall give further reports as the experiment continues.

Access

Stan Krute is a pinhead. He may be reached at 18617 Camp Creek Road, Hornbrook, California 96044. • 916-475-3428.

