



## Product Review: CBA IV

### Product Review of West Mountain Radio's CBA IV



**By: Joseph Gray W5JG**

A few months ago, someone donated quite a few commercial VHF handhelds to the local Amateur community. In addition to the radios, I had about three dozen lithium batteries to deal with. My first inclination was to charge the batteries and let those who received radios take their chances as to battery life. The “good technician” part of me didn’t like that solution, so I wound up buying a CBA IV from Ham Radio Outlet. The price of the CBA IV from Ham Radio Outlet was \$149.95 and included free shipping.

Taking one of the bad handhelds, I removed the circuitry, leaving me a shell with battery contacts. I soldered some heavy gauge wire to the battery contacts, crimped on some Power Poles and was good to go (the CBA IV has built in Power Poles). One short length of wire with Power Poles attached comes with the CBA IV. At some point, I’ll

probably build some type of test jig with adjustable contacts that will accept various batteries.

I installed the software from the included CD, plugged in the CBA IV with the included USB cable and I was ready to test batteries. My PC is running Windows 7, 64-bit. The CBA IV software installed and ran just fine for me.

The software as it comes with the CBA IV has several types of tests that it will perform. I won’t describe all of them in detail, only what I needed for my initial testing. For more details, go to the West Mountain Radio website. The included tests are Mission Profile, Discharge Test, Charge Monitor Test and Power Profile Test. For my immediate needs, I used the Discharge Test, which I will describe below.

If you pay extra for an Extended Software license, the following additional tests are available in the

software: Duty Cycle Test, Multiple Discharge, Constant Power, Constant Resistance and Charge Discharge. For me, as an Amateur, I would find the Duty Cycle, Multiple Discharge and Constant Power tests of use. These three additional tests would let me test batteries in ways that more closely resembled actual usage.

As to the original reason I bought the CBA IV, I wanted to test those lithium batteries that came with the donated handhelds. For that purpose, I just wanted to know how much capacity was in each battery. The standard Discharge Test was perfect for this.

Using the Discharge Test, you start by picking which type of battery you have (just about any type you might have is listed). I selected Li-ion, two cells, and 2.00 AH (the capacity listed on the battery). By clicking on a button labeled “Suggest”, a test current draw of 2.00 A was selected for me. Later research told me that Li-ion batteries are rated at a one hour discharge rate, as opposed to lead acid batteries, which use a 20 hour discharge rate. I knew about the lead acid discharge rating, but not the Li-ion. Thankfully, the software showed me the correct value.

The software also allows you to set a Pass/Fail threshold on the Discharge Test. The default of 80% capacity seemed reasonable to me,

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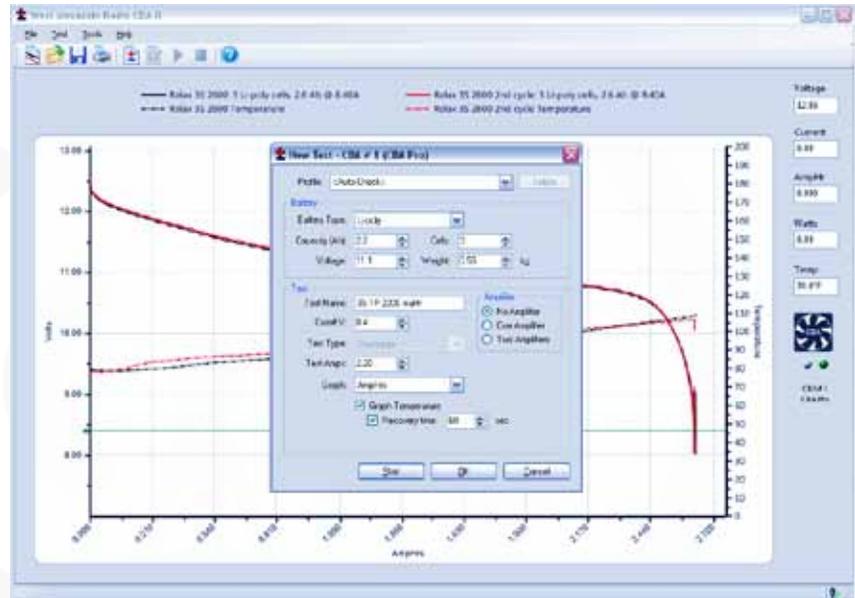


so that is what I used. From there, it was simply a matter of inserting each unknown battery into my makeshift holder and starting the test for each one. While the Discharge Test is running, the software graphs a discharge curve. The Y axis shows the voltage. You can change the X axis to display AmpHrs, WattHrs, Minutes and Ragone (this has to do with energy density and requires you to have entered the weight of the battery).

The software is actually quite nice. It allows you to save test results for each battery, overlay multiple battery tests on one graph and even export the data for analysis in other programs, such as Excel. You can also save images of the graphs in several formats. The program help is succinct, but adequate.

If you purchase the optional temperature probe, you can include battery temperatures in the results. Knowing the battery temperature also allows the software to abort a test if a temperature threshold is reached. Not having the optional temperature probe, I could not try these features.

At the end of three days of testing batteries, I clearly knew what the AH capacity of each battery was. I could actually rank the batteries from best to worst. Knowing which batteries still had at least 80% of their full rated capacity left was very helpful.



Screenshot of CBA IV Software

After having tested all of those handheld batteries, I decided to test some lead acid gell batteries that I use for QRP. I like the idea of being able to track a battery's capacity over time, rather than using it until it craps out, as I have done in the past.

As for the extended tests, I did try two of them. The Duty Cycle and Multiple Discharge tests allow you to more closely simulate how a battery is used in real life. In Duty Cycle, you set a fixed current draw and then on times and off times. The battery is then drained using these on and off periods. Even better, the Multiple Discharge test lets you set up to five different current draws, each with their own time period. Using the Multiple Discharge test on one of the handheld batteries allowed me to come close to simulating a real days usage. Radios used in Commercial or

Public Service are typically rated by the manufacturer for 5% talk, 5% receive and 90% standby. Amateurs talk and receive much more than this, on average.

I have not tried the other available tests yet. The Power Profile and Constant Power tests look to be of particular interest to me. When I have time, I look forward to trying these tests.

Although I resisted buying a battery analyzer for some time, I am glad that I now have one. I can see myself using it even more as time goes by. The West Mountain Radio CBA IV gives me hard numbers for comparing batteries and tracking batteries over time. As with any piece of good test equipment, being able to see the numbers appeals to me. I like having data to go on, rather than just guessing and hoping that my batteries are still good.