Changes to High Power Battery Testing Systems

By Mark Siegesmund

The very popular CBA works well for most of the typical batteries used in Amateur Radio. There is however a 100W (CBA II) to 200W (CBA V) limit on the discharge power. The West Mountain Radio solution to this limit is to use what we call an Amplifier. This article covers some changes to how the Amplifier works and how it will affect older and newer systems.

The traditional configuration looks like this:

Configure the software for one Amp. The software will command the CBA to draw a tenth of what it normally draws. For example, when doing a 10A discharge, the CBA will draw 1A. Then the Amplifier senses the 1A draw and it will provide an additional 9A draw. Inside the Amplifier, the CBA battery connection is made both to the battery and to the internal sensor. The Amplifier high power load is also connected to the battery. The CBA 1A and Amplifier 9A then provide the 10A load to the battery. Each Amplifier is good for an additional 500W.

Amplifiers can be connected in parallel to provide even higher discharge power. For example a 2000W system is configured like this:

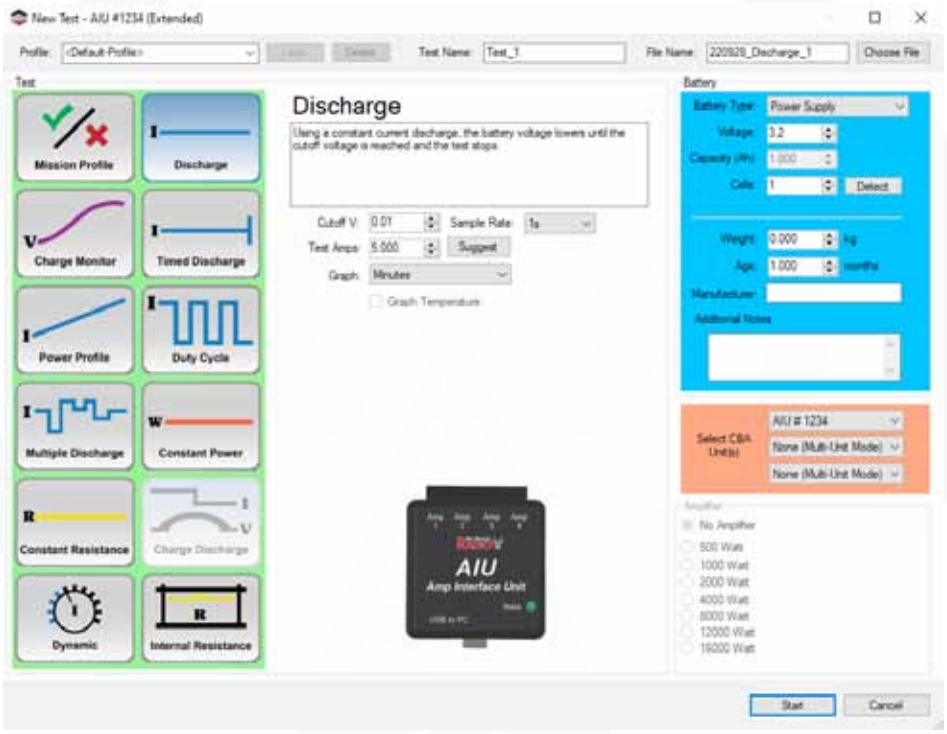
The original Amplifier was designed with analog circuitry. Around 12 years ago West Mountain Radio redesigned the Amplifier to make it a microprocessor based design. At that time a diagnostic port was added to aid in calibration and to allow for future expansion. You can identify the newer Amplifier that we call Amp2 by the diagnostic port that looks like a modular phone jack.

The firmware was recently updated on the Amp2 to provide better control over the discharge to allow higher power discharges if the room temperature is low enough. At normal room temperature a discharge up to 650W should work.

The new version 2 firmware also supports using the diagnostic port to accept commands to discharge instead of using the CBA sense port. West Mountain Radio is about to start shipping an Amplifier Interface Unit ("AIU"). The AIU connects to a PC by USB cable and each AIU can connect to up to four Amp2 units. The CBA software will detect the AIU and provide an option to use that for a test. The AIU reports how many Amps are connected so the software now knows exactly what to command for a discharge. The older method required the user to enter the correct number of Amplifiers. If entered wrong the on screen, the data was wrong. The accuracy is better because the error in sensing the CBA current is eliminated. There is also less of an opportunity for cable issues from the CBA to Amplifier. For large systems any number of AIU units can be connected to the PC.

The 2000W system now looks like this:

In the software the AIU selection looks like this when starting a test:



Once the AIU is in stock, new systems will use an AIU instead of a CBA. The AIU will be sold separately, however it will only work with Amp2 units with V2 software. Any Amp2 units can update to new V2 firmware, however they need to be recalibrated at West Mountain Radio because of the new algorithm. (Units purchased before October 1, 2022)

The Amp2 units with V2 firmware will still work with a CBA in the traditional configuration (no AIU). There is no upgrade path for the original Amplifier without a diagnostic port.

To fully understand the Amp2 units, be aware that they are currently not fully interchangeable. When sold in a 500W system the Amp2 is configured to multiply the CBA current by 9 to get 10x. When sold in a 2000W system each Amp2 multiplies by 19 for a 20x. The reason is to keep the total CBA draw under 40A. For example a 600A draw in a 2000W system will have the CBA draw 30A, then each Amp2 sees 7.5A and the multiply by 19 adds 142.5 making the draw on each Amp2 150A and for all four the total of 600A. If we used a x9 on each Amp2 the CBA would need to draw 60A and that is over its limit.

This long explanation was given for the understanding why one Amp2 from a 2000W system cannot be used by itself to get a 500W system. This is different with the AIU based systems and Amplifiers with V2 software. There is no multiplying in the Amp2, so the units can be exchanged as long as they use an AIU.

If you do not use the CBA software to control your system, then contact WMR to get information on the new USB interface direct to the AIU. The protocol is similar to the CBA but not the same.

The AIU is expected to start shipping late this Fall. Let us know if you have questions about how this all works or how to upgrade your system.

AIU Unit
58259-1882
$149.95