

WigWag Status Report

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History and Background

Prior to 2021, the wig-wag display at the museum entrance was manually operated by a 2 amp lamp pull cord switch, which had a history of burning out, due to how much we were exceeding the current rating of this switch.

The exhibit also was lightly used since it generally took decent involvement to run the display for visitors, and being a hard switch meant that when not in use, the display drew absolutely no power from the battery.

At the beginning of 2021, the wooden box with an arcade coin acceptor and a version 1 "Coin Operated Experience" control board was installed in place of the lamp pull switch.

Over the 2021 season, Kenneth charged the Group 8D battery in the display every 3-5 weeks when on site, and the battery needed charging every time. Given the size of the battery vs the number of times the display was getting run per month (approx. 30) the voltage drop indicated that the battery was well on its last leg for service life.

Over the 2021/2022 winter, we failed to turn off the main power switch inside the wigwag base, and at the beginning of the 2022 season (April) we found that the battery was down to 3V. I suspect that this was the final nail in its coffin after already being well on its way out. Steve Habeck installed a Black and Decker BM3B battery maintainer to keep the display running in mid June, but even with this maintainer on the battery the voltage continued to drop from 11.9V to 11.5V, and finally on 2022-07-02 the battery failed to operate a complete experience when a visitor inserted a quarter, so I red tagged the display and took it out of service.

Current status and hardware configuration

On 2022-07-02, Steve Habeck moved a 12V car battery from the "Rock Island" caboose into the wigwag display as the new power supply. This is a car starter battery, meaning it isn't the ideal deep cycle battery needed for the application, but it plus leaving a battery maintainer on the system should be ideal since any battery drain due to a visitor run will be recovered in a few minutes from the float charger. This battery was originally purchased new in 2014, but should still provide a functional base for this display for several years to come given the plan to keep it plugged into a dedicated battery maintainer full time.

Another observed issue with the coin acceptor was that it would often not accept visitor's coins, even after several attempts, which was likely due to the large changes in the battery voltage. Once the

battery was replaced and fully charged, Sunday morning 2022-07-03 Kenneth ran the coin acceptor through a full calibration and training sequence for nickels, dimes, quarters, and dollar coins. He also turned the coin selectivity from 5 to 10 on a 1-30 scale (with 1 being the most picky) so the coin acceptor has now been fully calibrated on a 14.1V battery voltage and been configured to be more permissive when scanning coins, so it's expected to be more willing to take people's money going forward.

Kenneth forgot to bring the serial cable required to download and reset the statistics on the Coin Operated Experience controller board, but during the stream weekend it was run approx. 10 times on Sunday and several times on Monday, so the display is back in service and popular. Given the last time the statistics were reset was late 2021 season, and the number of testing runs performed this weekend while troubleshooting, the recorded statistics inside the display are now largely meaningless.

Future Work Still Required

Given that the initial prototype of the coin operated display has been successful, there are several pieces of work which should be done to further clean up this display:

1. The controller box wiring was originally cut into the lamp pull switch location using wire nuts. Given the availability of electrical studs inside the wig wag base, all of the wiring inside the wigwag should be converted to ring lugs and secured to the terminal lugs and labeled.
2. The harness between the wigwag base and the coin acceptor control box should be connectorized to aid in transporting the wigwag display when it needs to be moved for special events or museum reconfiguration.
3. The controller box needs to be painted. The initial prototype is an unfinished wooden box.

★★★★★ · 8 years ago

Maintains solar power battery bank

Our primary home lighting system is based on 400 lumen 12vdc LED light fixtures. They are powered by a Group 29, 115 amp/hour deep cycle battery which is primarily charged by the BM3B. (When the power goes out we switch over to solar charging.) Works flawlessly. However. We recently added a brand new deep cycle battery (Exide 27MDCST group 27, 105 a/h)that this thing can't seem to properly charge. It took 3 days to top it off from the store - and then stays in trickle charge mode indefinitely unless you unplug and plug it back in at which point it goes into float mode. Put even the slightest load on the battery and the BM3B will go back into permanent charging status. Volts look good - how can I tell if it is the charger or the battery?

4. Similar behavior has been observed on the BM3B battery maintainer as mentioned in an online review that it seems to never make it into the final maintainer stage, and it is currently floating the battery at 14.1V, which is a little high for long term float service on a wet lead acid battery. As part of the rewiring work to be done inside the wigwag base, Kenneth will test another brand of battery maintainer to see if it behaves better with the expected workload of a low <0.1A continuous drain and periodic pulse loads from the wigwag itself.

Note: As part of the rewiring work, the wigwag base will be cabled such that there will only be a single well-labeled cable running from the terminal lugs to the battery itself. If desired, this would make the wigwag display an ideal place to rotate batteries which need to be placed on a float charger for several weeks at a time.