



EAA Chapter 52 Wing Flap

July 2021 Edition

Right Seat,

By Jim Heffelfinger

Is anyone building anymore? A quick look at our membership list and I see only a few builders and knowing my project, all appear to be being worked on by spiders vs humans. Are there any I have missed? Email me on your status –

jimheffelfinger@gmail.com

Although being a pilot is in no way a condition for membership but are needed for offering Eagle/Young Eagle flights. Take a moment to give me an email if you are active/current so I can pull together a pilot list.

**NO GENERAL
MEMBERSHIP MEETING
IN JULY!!!**

Have fun in Oshkosh!

Looking for doing a collaborative this fall - spring with other chapters.

Although we are in summer – and AirVenture week - think about joining the board for the 2022 year. Ask me about duties/opportunities for a briefing.

There have been limited interest in forming a flying club to place aircraft(s) for multi-partnership. If interested contact me for information. This mitigates the hurtles of solo ownership.

the year \$30.00 send to EAA

Chapter 52 , P.O. Box 15743

Sacramento, CA 95852-5743

About the New Wing Flap Editor

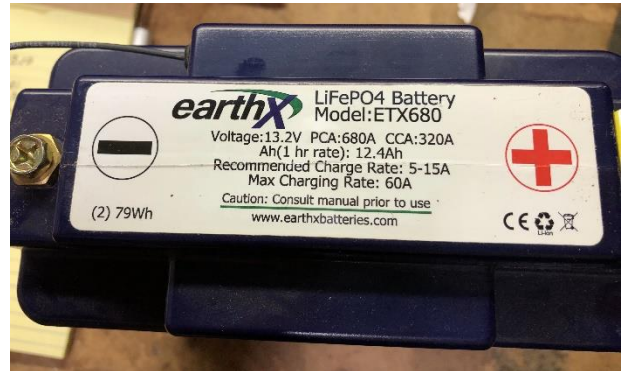
Hello my name is Nicholas Theodorovic and I am taking over the editing of the monthly Wing Flap. I am 15 and attending Pleasant Grove High School as a rising Sophomore. I am truly excited to be the new editor along with starting my flying journey with EAA. Two things about me are I love to bake and I play competitive lacrosse! Please e-mail me at nicktheodorovic@gmail.com with any articles, questions, or concerns.

Inside an EarthX Aviation Battery

Jim Heffelfinger 7/17/21

Ever wonder what's inside the aviation version Earth X battery? Well here you go.

I had one on the shelf for about 2 years hoping to get it into something that flies. On the last



topping charge (6mo cycle) the failure light lit up and stayed lit. I called EarthX and advised them of my problem. They responded with - after several emails and them understanding I knew what I was talking about - it is out of warranty and the best they could do was offer me a discount for another. Since the battery was never in service and was only charged with a CCCV charger I thought a full replacement was in order. The discount was surprisingly low for such an expensive battery so I said sodd-it and put it back on the shelf . I have been building other battery banks for boats, emergency kit and camper and had all the tools at hand.... Here are the autopsy photos and report.

Macro view the battery capacity is a sweet spot for LSA sized planes and the battery, although pretty big, is relatively light for

such reported performance. This battery is 6.5 x 3.1 x 6.6 in 4.1 pounds Retailing for \$379

Cracking the case was really easy with a hot knife scoring the case halves and a little pressure at the join had the case split easily.

First Glance has the battery actually 2 prismatic batteries – each “12v” connected to in parallel, with a BMS system that monitors each. AND a whole lot of space filled with foam spacers. In fact removing the spacers allows the two to fit into the single half of the battery case. You may interpret that as you will.

Each pack is marked as 6.4 Ah – a total of 12.8 for the complete battery. [note spec sheet noted 16 equivalent amps as a Lead-acid battery discharge curve is near

linear and only ~70% of the capacity is usable for service]

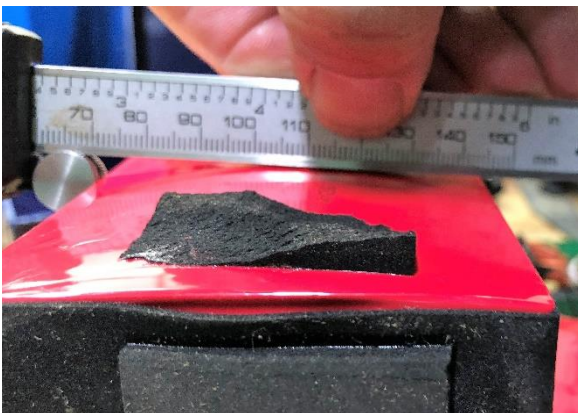
Inspection: both batteries had swelled in size showing >>>>> signs of a failed battery Each 12 volt bundle [4 cells in series – 4S] < photo>

Each Battery had degraded to around 10 volts static the typical LiFePO4 battery chemistry cut off and was officially dead.

An attempted recharge was able to bring them back to 13.8 volts (14.4 fully charged) but they measured under that very quickly returning to 10v within days. Dead

Why the battery failed is a mystery as it was in a garage never being subjected to high or low temperatures outside of a normal environment for any vehicle battery and always topped off with a 14.4v CCCV low power charger. I will build my own battery in the future using fresh cells and know of the condition of the balanced cells.

There are a variety of Lithium Ion batteries. The most common – Li Cobalt as found in most cell phones and laptops and the more stable but slightly lower energy



density Lithium Iron Phosphate [LiFePO₄] which has a convenient 3.2 volts nominal per cell.

Here is a concern with prismatic cells, commonly used in “deep cycle” conditions where the load is long and relatively light, and “starting battery” where the current is high but short usually the forte of a cylindrical cell. This is listed as 320 CCA (a lead acid battery term). I question the ability to actually do that level of current. Many manufacturers use ‘Pb equivalent’ references but these are completely different discharge curves and not compared using lead acid terms.

BMS – Battery Management System – is designed to monitor the discharge, charge and cell balance for battery longevity. Unlike a lead-acid battery that is tolerant to all manner of things and still have it come back to life - Lithium chemistry is not so - BMS controls the max charge and discharge currents cutting off the current if exceeded. Turning off the power when a low level is reached. It monitors the cells and keeps each cell at optimum through either sharing the higher

voltage cell with the lower ones or drags down the high cells to the lower so they have the same level of charge. Having a matched set of batteries is a key to a long and fruitful life. Using the markings on a tested cell for matching is an entirely different article. A Li battery will not recover from a 0 volts discharge.

Charging – you should never use a lead acid battery charger to charge a Li battery. The in-vehicle charge system is fine but most bench chargers will damage the battery if left on for long periods.

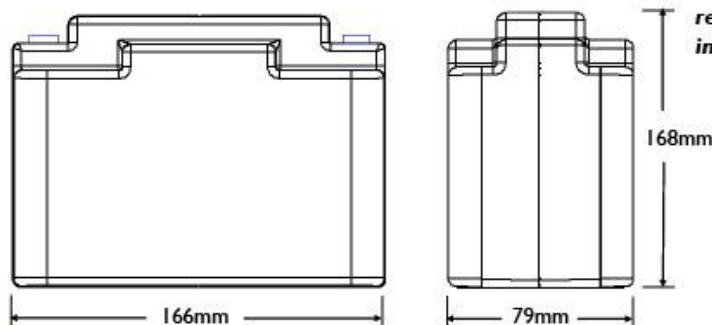
Skill Building - Pilots

EAA has an initiative established in 2019 that many have gone unnoticed in the craziness of this last year. Go here to see the elements of the Proficiency Program. Project 21 is part of this program.

<https://www.eaa.org/eaapilots/EAA-pilot-proficiency>

Brass terminal: 12mm wide, 3mm high

Screws: M6 (6mm dia., 10mm length)



Lightweight LiFePO4 battery with exclusive over discharge protection, over charge protection, short circuit protection, excessive cranking protection and built in cell balancing technology. All of these features are redundant with an LED battery fault light indicator.

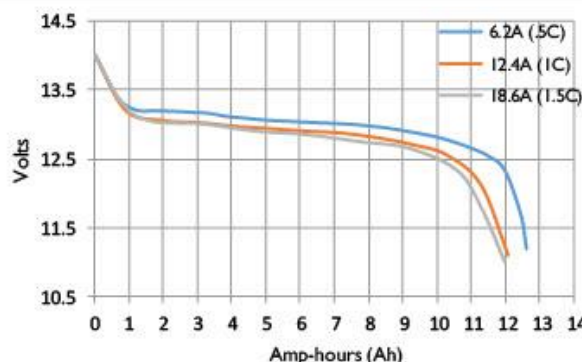


Specifications

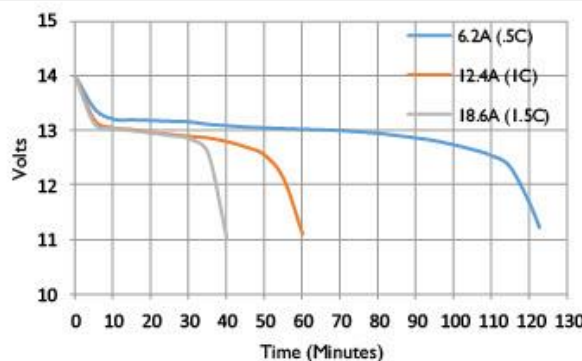
Voltage	13.2V
Capacity	12.4Ah @ 1C Rate (See charts)
Capacity vs Temperature	25 °C = 100% 0 °C = 92% -30 °C = 80%
Self-Discharge Rate	< 3% / month @ 25 °C
Pulse Crank Amps (PCA)	680A (3 sec @ 25 °C, voltage >9V)
Cold Crank Amps (CCA)	320A (modified SAE test, 3 sec @ 0 °F, volts >7.2V)
Continuous Discharge Amps	100A
Standard Charge Voltage	13.9 - 14.6 V
Maximum Charge Voltage	15V
Recommended Charge Amps	5 - 15A
Max Charge Amps	60A (from vehicle charging system)
Life (Charge cycles, 80% depth of discharge)	4000 cycles @ 1C discharge rate, 25 °C 2000 cycles @ 10C discharge rate, 25 °C
Life (Years)	Up to 8 Years
Weight	3.9 lb. (1.8Kg)
Dimensions	6.5 in (L) x 3.1 in (W) x 6.6 in (H) 166mm(L) x 79mm (W) x 168mm (H)
Environmental Rating (resistance to water intrusion)	IP 66 (wash down with a high pressure washer)
Operating Temperature	-30 °C to +60 °C
Storage Temperature	-40 °C to +70 °C

Discharge Characteristics

Discharge Ah (multiple discharge rates)



Discharge Minutes (multiple discharge rates)



SULLENBERGER NOMINATED AS ICAO AMBASSADOR

PRESIDENT JOE BIDEN TAPPED RETIRED AIRLINE CAPTAIN CHESLEY “SULLY” SULLENBERGER, BEST KNOWN FOR HIS STARRING ROLE IN A REAL-LIFE DITCHING LATER MADE INTO A MOVIE, TO LEAD THE U.S. MISSION TO THE INTERNATIONAL CIVIL AVIATION ORGANIZATION.

Sullenberger’s

nomination to be the new ICAO ambassador was announced along with a slate of nominations of less familiar names to various posts. Sullenberger and First Officer Jeffrey Skiles ditched US Airways Flight 1549 in New York’s Hudson River in 2009, notably



with no loss of life, after geese

knocked out both engines of their

Airbus A320 shortly after takeoff.

The events of that day made

“Sully” a household name, and he

has put his star power to work as

an advocate for aviation safety,

and aviation overall. In

2017, **Sullenberger spoke out**

against air traffic control

privatization, helping to kill a

proposal that would have

endangered the future of aviation.

Upon Senate confirmation, Sullenberger would be the eighteenth representative of the United States to serve on the international body created by the United Nations in 1947 to harmonize aviation standards and regulations worldwide.

“Captain Sullenberger certainly understands aviation and its global reach, and the United States and ICAO would benefit greatly from his experience, knowledge, and leadership,” said AOPA Senior Vice President of Government Affairs and Advocacy Jim Coon.

Sagetech Avionics Receives \$12M Investment

WHITE SALMON, WA, June 29, 2021 – Sagetech Avionics Inc., an innovative technology company providing industry-leading avionics solutions for Uncrewed Aerial Systems (UAS), announced today that the company received a \$12 million investment from Due West Partners, a Seattle-based private investment firm. The investment will enable acceleration of Sagetech’s product roadmap, specifically, UAS Detect and Avoid (DAA) capability and other related technologies. Terms of the transaction were not disclosed.

“We are excited to partner with Due West Partners” stated Tom Furey, CEO of Sagetech Avionics. “Their experience in scaling aerospace companies and deep network of experts in the Defense and Aerospace ecosystem will provide substantial benefits to Sagetech as we continue our growth in the exciting UAS and Advanced Air Mobility (AAM) markets. Sagetech is honored that Due West recognizes the strength in our market position and the future value of our technology roadmap, and we are looking forward to a lasting and mutually beneficial relationship.”

Sagetech Avionics provides the most advanced technology core for type certifiable detect and avoid systems for UAS. With this investment, Sagetech will expand their Engineering and Go-To-

Market teams in order to support the growing demand for DAA and other situational awareness solutions worldwide.

“Sagetech combines a unique blend of advanced situational awareness solutions, which are crucial to unlocking the future potential of the UAS and AAM markets, with an unmatched history of providing reliable miniature avionics for use in the US Department of Defense,” said Nick Wellmon, Managing Partner of DWP. “Proven technologies and customer credibility plus significant market potential create a very exciting opportunity.”

“Situational awareness products are required technology for safe integration of crewed and uncrewed vehicles into managed airspace, and Due West Partners is pleased to support a company

helping customers overcome these challenges,” said Robert Dickinson, Managing Partner of DWP.

About Sagetech Avionics

Sagetech Avionics, Inc. is an aerospace technology company empowering safe flight in uncrewed aircraft with situational awareness solutions built from mission-critical transponders, software, and related technologies. Currently serving military and civil duty on most small to medium UAVs, Sagetech solutions are mission-proven and offer decades of program experience, certifications, and millions of flight hours to deliver maximum value over the life of an unmanned platform. Today, Sagetech is expanding its technology platform to create comprehensive, certifiable

systems such as detect and avoid solutions. Every day, Sagetech works in concert with its extensive ecosystem of OEM customers, technology partners, and resellers to ensure UAVs fly safer with Sagetech on board. Learn more at www.sagetech.com.

About Due West Partners

Due West is Different. With patient capital aimed at creating sustainable growth and building legacies, Due West Partners offers companies an alternative source of capital to grow their business. Our goal is simple: empower established businesses with the additional resources and expertise they need to focus on long-term value creation.

Microsoft Flight Simulator is a Fantastic Flying Experience on Xbox Series X|S

I just flew an Airbus A320 from my couch, and I can't believe I just typed that. Having logged some time with the PC version of *Microsoft Flight Simulator* over the past year and going hands-on during its lead up to launch, I'll confess that I remained cautiously optimistic about how well the simulator experience would translate to a console.

Well, as this avid fan of both aircraft and flight simulators, I'm happy to report that *Microsoft Flight Simulator* has absolutely nailed the landing on Xbox Series X|S, giving gamers a robust, exhilarating, and worthwhile experience that can't be found on any other console today.



Start Flying Immediately

Having spent a solid day with the Xbox Series X|S version of *Microsoft Flight Simulator* – specifically on my personal Xbox

Series X – I’ve flown over black bears in Yosemite National Park, cruised over the Ancient Pyramids, buzzed Seattle’s Space Needle, and even visited the Mauna Kea Observatories on the island of Hawai’i.

These quick trips around the globe are thanks to the new Discovery Flights feature that drops you over curated points of interest in ideal weather conditions, letting you easily fly over iconic landmarks, monuments, and other areas of splendor. It basically turns *Microsoft Flight Simulator* into a killer sightseeing tour operation. You can also

create manual waypoints using the robust World Map (now with real map telemetry data) to design a flight path with a few easy clicks. Or you could just drop a pin anywhere in the world, making it that much easier for you to fly over your house.



Going Back to (Flight) School

Flight Training with the Cessna 152 has received a little bit of an overhaul, with many of the flight lessons now assigning points on your performance, giving

more detailed feedback on how well you've executed your latest flying lesson, and being assigned an A, B, or C grade. I found this extremely useful, especially



transitioning from a flight stick to the Xbox Wireless Controller, as I had to sort of relearn how to fly.

Speaking of the Xbox Wireless Controller, I found that it translates well to a console flying experience. While in cockpit, it feels like you're playing a flying

first-person shooter (first-person flyer?): the left analog stick controls the elevator and ailerons while the right analog stick controls your pilot's head. The rest of the default mapping makes a lot of sense, with the triggers managing your rudder, the surface buttons managing your throttle and brakes, the d-pad controlling the landing gears and flaps, and the bumpers acting as modifiers for some of the more complex tasks (trim, camera position, etc.).

It takes a little bit of practice, for sure, especially coming from a flight stick/keyboard and mouse setup if you played *Microsoft Flight*

Simulator on PC. But by the time you complete most of the Flight Training you should feel right at home with an Xbox Wireless Controller in your hands as you take to the skies.

Too Much Good Stuff

Console pilots jumping into *Microsoft Flight Simulator* for the first time will be treated to a massive amount of readily available content on day one. After a year full of World Updates with enhanced 3D photogrammetry on



real world locations like Japan, the Nordics, and the United Kingdom, along with some free and paid DLC (some that remains PC only for now), there's almost so much good stuff that it's hard to know where to start.

Beyond that, you also have all the existing Activities returning to deliver some great pre-planned scenarios for you to try. Landing Challenges are not for the faint of heart, delivering an incredible challenge that will cut your piloting teeth while asking yourself, "Did they seriously build an airport *there?!?*" I still can't believe I managed to land an A320 at Paro International Airport, albeit with a

C grade. And yep, you read that right. You get graded on the Landing Challenges now too, putting your score on a leaderboard so you see how well you stack up against your friends.

There's also my personal favorite, Bush Trips. These are some of the most picturesque flight paths you can take in *Microsoft Flight Simulator* that are both a true test of your piloting and terrain reading ability where you must rely only on VFR (Visual Flight Rules) to make your way from point A to B – so following roads, rivers, and other landmarks to keep on track. There are assists in place should you

find yourself off track, but I can imagine these will be some of the hardest achievements to earn in the game (I'll make my way all the way to Mariposa without any help... one day).



It's still settling in for me how well *Microsoft Flight Simulator* has translated to a console experience on Xbox Series X|S. It feels really close to a 1:1 experience that can be found on a modest gaming PC, albeit

with an Xbox Wireless Controller in hand instead of a flight stick – and if you're looking for a console flight stick, [I can help you with that here.](#)

It's going to be great re-experiencing this simulator all over again on console, on a large 4K screen and from the comfort of my sofa. Not to mention Xbox Series X is considerably more powerful than the gaming laptop I previously played *Microsoft Flight Simulator* on. But I think I'm most excited to see all the future console pilots – maybe for the first time — experience one of my favorite genres in gaming. It's going to be great seeing so many

screenshots, videos, and more in the coming weeks from the Xbox community as they take to the skies with this can't-miss experience.

Can't get to AirVenture this year and need a fix..... full photo gallery – [hundreds \[thousands\] of photos...](#)

KOSH/ AV19; Live feeds going on

ATC -

https://www.liveatc.net/search/?icao=os_h

Flightradar -

<https://www.flightradar24.com/43.99,-88.56/13>

For Sale:

KUNTZLEMAN ELECTRONICS, DOUBLE DUAL MAGNUM – SYSTEM 12 volt Model with Driver and Two STANDARD STREAMLINE Heads - \$153 New in box.

<https://kestrobes.com/product/double-dual-magnum-standard-12-volt-model/> -

Email: jimheffelfinger@gmail.com

Bendix_King Av8or - In box used. Make offer - Jim Heffelfinger

Free - AVMAP IIIC GPS jim Heffelfinger

AirVenture Day 3: Whoa! Major Course Change for FAA on MOSAIC; It's All Great!

As you readers must know, I prefer to focus mainly on the airplanes, on light aircraft. It's what interests me and I've learned it's what interests you* as well. I captured more cool aircraft news on Day 3 and I will return to that tomorrow. Today's topic is different.



Affordable aircraft are important to many readers. I get that completely and that's why my Day 1 report focused on six aircraft that are very easy to own. Speedy aircraft are of also great interest.

In general I like to say (modifying a view expressed by Apple Founder Steve Jobs) that — “It’s all about the airplanes.” Other high-traffic features of this website include the SLSA List, PlaneFinder 2.0, and our market statistics.

However, one non-aircraft topic always draws lots of readers. When I report major moves by FAA that can have an impact on your ability to fly, you sit up at your smartphone, tablet, or laptop and pay attention.

I personally find it absurd that we wait for FAA to make regulatory decisions and *then* create or modify aircraft to fit their prescriptions. It seems infinitely more logical to me that the market creates aircraft pilots want and only then should FAA pursue regulation as needed to ensure public safety. Yet in today's government-driven world, pilots must remain aware of what the aviation agency will do.

FAA Pivots Hard ...making *Good* Changes (in my humble opinion)

We were happy to have Zoom's technology in 2020 so we could meet with coworkers, bosses, friends, and family online when we not allowed to congregate in person. I observed, though, that use of Zoom tapered off after the novelty became the familiar. No matter how well that tech company did their job, faces on a screen cannot fully replace in-person meetings. It's just not the same.



The magic of airshows and their ability to deliver in-person meetings showed their value yesterday at AirVenture Oshkosh. The following relates the story as best I could piece it together. ***Be advised this is not the final word***



on the subject. In fact, it is so fresh that changes are probable.

Our friends in EAA's Advocacy department, lead by Sean Elliot and aided by experienced staff held a special Mosaic meeting with FAA. In such a gathering at AirVenture 2021, EAA team members reportedly pushed back on Mosaic regulations, calling it "overly complex." (I was not present at this meeting, so this report is second hand.)

In the meeting, key FAA officials were present and in a remarkable development (which I am surely oversimplifying here), FAA agreed and in the space of a single meeting, listen to what occurred.

Steve Dickson (facing camera) was sworn in as FAA administrator on August 12, 2019 after being confirmed for a five-year term by the U.S.

Senate on July 24, 2019. Dickson recently retired from service as the senior vice president of Flight Operations for Delta Air Lines.

The whole idea introduced in May of 2020 (see this article) set up Light-Sport Aircraft as a subset of something brand new called Light Personal Aircraft. The former would get bigger and more capable but it was the latter that appeared ready to invite still-larger aircraft, perhaps with four seats, retractable gear, faster speeds, and other abilities.

Light Personal Aircraft has apparently been scrubbed — just like that, in a single meeting ...but one involving key decision makers including the LSA industry's good friend, Earl Lawrence. An engineer with a strong CV, Earl has risen quickly within FAA and today is the manager of aircraft certification. He has long preferred simpler solutions and reportedly concurred that Mosaic plans for LPA were overly complex.

LPA is history, barely a year after it was first invented by rule writers. *(Surely, we will hear more definition about this in coming weeks, but the preceding statement*

looks accurate according to several persons.)

Another part of the Mosaic proposals to-date is a formula method referred to as Power Index. Quite a number of you have done the math and tried to determine if one or another airplane can fit.

Flight Design USA boss, Tom Peghiny (gesturing) explains Light-Sport Aircraft to the administrator and other staff as Dickson prepared to try sit in and experience the new F2.



Power Index is also “probably” history, before most of us ever understood precisely how it will work. It, too, was judged unnecessarily complex and many people more qualified in engineering than me would quickly

agree. In addition, it seemed a complicated way to accomplish an objective that could be achieved by other means.

The proposed **200-horsepower cap is “probably” history** as well. According to reports, several FAA people recognized that the amount of horsepower is not a key determinant to FAA sticking to its LSA mantra of “Safe, Simple, and Easy to Fly.”

My advocacy partner, **Roy Beisswenger**, who attended several FAA briefings, said, “The key phrases to come out of an FAA meeting was that LSA should be defined as “easy to fly” or “docile to fly” and then let the industry define exactly what that means.” He added, “Different weights and categories of aircraft would be allowed as endorsements.” Endorsements have already been used with good success for basic Sport Pilots to advance their privileges.

The ASTM F37 group that prepares standards for FAA to use in accepting (or not) new LSA aircraft has been furiously working

to prepare for all the Mosaic changes so aircraft can demonstrate meeting the standards soon after the rule is final, allowing sales to pilots. As those volunteers do their work and as we hear more, I will report more as quickly as possible.

So, Mosaic enters a new state of development but I view all these changes as positive. Keeping regulations simpler will enhance the ability of developers and users/pilots to follow them so they can perform their function efficiently.

In Oshkosh RIGHT NOW

Oshkosh is getting hit with a serious storm and they are shutting down all evening activities and sheltering in place or the museum. Big concern is the anchoring of the planes in already pretty wet conditions with high winds. Hopefully everyone is safe, and no damage occurs.



You celebrate Shark Week your way, we'll celebrate it ours. 😊





AUGUST							
S	M	T	W	T	F	S	
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	
29	30	31					



Corsair Night Run

Photo Credit: Connor Madison