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PAGE 33 /

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CONTENTS



FEATURES

18 **Free Flight World Championships**

Free Flight World Championships
By Jace Pivonka

24 **Warbirds and Classics of the Bluegrass**

A Giant Scale contest with a lot of heart
By Rachelle Haughn

DIGITAL CONTENT ICONS

-  Video
-  Additional Photos
-  Social Media/Conversation
-  Downloadable Content/Plans
-  Additional Content

REVIEWS

29 **Horizon Hobby Hangar 9 CubCrafters XCub 60cc ARF**

Officially licensed XCub provides versatility
By Tony Stillman

33 **Flex Innovations Mamba 60E Night Super PNP**

An excitingly capable biplane
By Jay Smith

37 **Flex Innovations FV-31 Cypher**

Exploring the fringes of RC Flight
By Terry Dunn

43 **Horizon Hobby E-flite Turbo Timber 1.5m BNF Basic With AS3X and SAFE Select**

Fly from floats or wheels right out of the box
By Greg Gimlick

53 **Moustache Model Works 20cc DHC-2 Beaver**

An enjoyable model to build and fly
By Fitz Walker

29



18



COLUMNS

- 04** View from HQ
By Chad Budreau
- 06** The Inside Loop
By Jay Smith
- 07** Click On
- 08** AMA In Action
- 12** Product Spotlight
- 14** In the Air
- 58** Focal Point
- 60** Old-Timers
By Bob Angel
- 63** Small-Field Flying
By Pat Tritle
- 68** Electrics
By Greg Gimlick
- 72** Sky's the Limit
By Jennifer Reynolds
- 76** The Deal With Drones
By Matt Ruddick
- 80** RC Giant Scale
By Sal Calvagna
- 84** RC Slope Soaring
By Ken Hawkins
- 88** RC Scale Aerobatics
By John Glezzellis
- 92** Control Line Scale
By Fred Cronenwett
- 96** Free Flight Duration
By Louis Joyner

- 99** Donations
- 125** MA Marketplace
- 126** Index of Advertisers
- 127** Viewfinder
- 128** I Am the AMA
By Jay Smith

AMA NEWS

- 103** AMA Foundation
By Dan Bott
- 104** District News
- 115** AMA Enrollment Form/
AMA Safety Code
- 116** Plans Service/
Submission Guidelines
- 117** Membership Information/
MA's Frequently Used
Abbreviations/Acronyms
- 118** Education Through
Aviation
By Kyle Jaracz
- 119** Flying Site Assistance
By Eric Williams
- 120** Sanctioned Event
Calendar



ON THE COVER

Foam-composition models have come a long way. Marks in the foam from the molding process have been replaced with scalelike details. Assembly techniques have been refined and stabilization technology added to some of the aircraft to assist the pilot.

The Flex Innovations Mamba 60E Night Super PNP, paired with the Aura 8 flight stabilization system, provides an enjoyably refined flight experience and the LED lighting systems allows for flight operations from dusk until dawn. To learn more, see our full review starting on page 37. PHOTO BY MATT RUDDICK.



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AMA SECURING OPERATIONS ABOVE 400 FEET

By Chad Budreau, AMA Executive Director | chadb@modelaircraft.org

THE FEDERAL AVIATION REGULATIONS AERONAUTICAL INFORMATION MANUAL is on my desk. This massive book, in 8-point font, is more than 1,000 pages long. In intimate detail, it outlines various rules and procedures for manned aviation.

The cynics among us will argue that this is another example of the federal government using 10 words for what could be conveyed in one. Although that might be true, this book also demonstrates that the FAA cannot manage aviation with a one-size-fits-all approach.

A 737 commercial airline pilot should follow different rules and policies than what a Cessna 172, vintage Stearman, or helicopter pilot follows. Regulations should vary depending on a pilot's skill, risk factors, environment, and aircraft. The same holds

Thank you to our members for maintaining our track record of safety and for your patience while we work to implement the new law. As we enter our second year of discussions with the FAA, we are starting to see fruits from our advocacy efforts.

true for unmanned aircraft. Blanket one-size-fits-all regulations do not work for unmanned aircraft. Congress and the FAA agree.

I'm overly simplifying the issue, but in 2018, Congress passed a law that tasked the FAA to restrict recreational operators to flight no more than 400 feet above ground level (AGL). Before the passage of the law, we successfully advocated that the bill should allow for special operational parameters for community-based organizations such as the AMA and our fixed flying sites.

A 400-foot "line in the sky" makes sense for an uneducated, casual operator buying a drone from a box store, but special accommodations for higher altitudes must be made

for AMA members who have a demonstrated track record of safely mitigating risks.

After the law was passed, we knew that we had a long road ahead to accommodate our operations. Implementing the law would be a multiyear process. The federal government is designed to work slowly. Although it is frustrating at times, the founding fathers did not create a federal government that can act swiftly. James Madison and others deliberately created bureaucracy and inefficiencies to avoid giving any federal branch or individual too much authority. You might as well call them the "Founding Fathers of Gridlock."

Because of this, we have anticipated that the implementation of the law would take many years. In October 2018, AMA and the FAA distributed the joint message that our community should continue flying safely as it always has while we work to implement the new law to accommodate our operations.

Thank you to our members for maintaining our track record of safety and for your patience while we work to implement the new law. As we enter our second year of discussions with the FAA, we are starting to see fruits from our advocacy efforts.

We recently held multiple face-to-face conferences with the FAA at Safety Risk Management meetings. We invited club officers to join us at many of these meetings while we demonstrated how our safety program and flying sites mitigate any risk for operations above 400 feet AGL.

In addition to Safety Risk Management meetings in Washington, D.C., we are sending staff and AMA leadership across the country to participate in additional discussions with local air traffic control facilities. The culmination of 15 months of work and the recent Safety Risk Management meetings are resulting in our operations finally achieving the clarity and authorization we need to fly above 400 AGL.

Details are still evolving. I encourage you to look for more information at www.modelaircraft.org/gov, on social media, and in your email, as we continue to advocate for the hobby that we all love!

Stay safe! 



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A SAFE AND SUCCESSFUL START

Jay Smith, Executive Editor
jays@modelaircraft.org

ANYONE WHO FLIES a model aircraft can make an impact—positive or negative—with where they fly, how they fly, and the purpose behind their flying. As our hobby has evolved, it has become easier for

about the need to seek permission to fly in controlled airspace or that flying in national parks is generally not allowed. AMA's clubs are a great resource to help people get started in the hobby, but what about those who aren't aware of clubs as a resource?

AMA has partnered with Horizon Hobby on the Horizon Hobby Flight School. The program allows people who have purchased a qualifying Horizon Hobby trainer aircraft to pair with a coach who is a dedicated RC pilot and enjoys helping new hobbyists learn how to fly.

I urge those who feel capable of passing along knowledge and providing training to consider signing up to help. If you are

“AMA has partnered with Horizon Hobby on the Horizon Hobby Flight School. The program allows people who have purchased a qualifying Horizon Hobby trainer aircraft to pair with a coach who is a dedicated RC pilot and enjoys helping new hobbyists learn how to fly.”

someone to purchase an aircraft and take to the sky without any training or instruction. Opening our hobby to more people is a good thing; however, it is important that those new to the hobby are given the tools they need to be safe and successful.

Newcomers to the hobby might not know

interested in being a coach, you must have experience with flight instruction and be an active member of your local AMA chartered flying club. You can learn more about becoming a coach by visiting www.horizonhobby.com/content/flightschool-become-a-coach. 

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Model aviation is fun, and it's even more fun when shared! I Fly AMA is a Facebook community created to bring AMA members together to share projects, building tips and tricks, and modeling stories with like-minded modelers. Whether you fly airplanes, helicopters, drones, prefer Free Flight, Control Line, or RC, this place is for you. At the heart of each discipline, we all share one thing in common: a passion for flight!

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AMA MEETS WITH THE FAA DEPUTY ADMINISTRATOR

By Tyler Dobbs, Government Affairs director | tylerd@modelaircraft.org

RECENTLY, THE AMA Government Affairs team had a promising meeting with FAA Deputy Administrator Dan Elwell to discuss the new regulations for recreational UAS that are negatively impacting the model aviation hobby. This meeting was an important milestone in our work to protect AMA members and model aviation as the agency implements Section 349 of the FAA Reauthorization Act of 2018.

The meeting with the deputy administrator focused on the FAA's policy to limit modelers to an arbitrary 400-foot limit in controlled airspace. This policy was one of the more pressing issues that modelers were facing. As a result of the meeting, we are now reaching

Although AMA is unofficially recognized as a leading CBO, this official process will position our organization to more effectively comply with the regulatory requirements and ultimately serve AMA members better.

solutions and seeing results to the altitude restrictions.


We used this meeting to explain to Deputy Administrator Elwell that, although most of the modeling community can operate safely below 400 feet, there are some cases in which the altitude limit actually makes our operations less safe. Everyone's primary goal is to keep our airspace safe; therefore, they agreed to work with us to find a solution to this problem.

The FAA asked AMA representatives to participate in a Safety Risk Management panel that is working to address the altitude restriction issue. Since the national Safety Risk Management panel was conducted in December 2019, a number of AMA fixed flying sites have been able to secure altitudes above 400 feet.

We also discussed with the FAA the process by which AMA will be officially recognized as a community-based organization (CBO). Although AMA is unofficially recognized as a leading CBO, this official process will position



our organization to more effectively comply with the regulatory requirements and ultimately serve AMA members better. It will also help AMA educate newcomers to the hobby who still need to learn how to fly safely and responsibly.

If you have any questions or concerns, please feel free to contact the Government Affairs team at (765) 287-1256 or amagov@modelaircraft.org. We are always happy to chat with you. 



AMA MODEL AVIATION HALL OF FAME

ESTABLISHED IN 1969, the AMA Model Aviation Hall of Fame honors men and women who have made significant contributions to the sport and hobby of aeromodeling. Selection is based on the individual's contributions to model aviation, which can include competition, design, experimentation, leadership, education, organization, writing, publishing, manufacturing, or other related activities. Emphasis is on the accumulated contributions in one or more of these categories over an extended period of time.

The selection committee is composed of past and present AMA presidents and one individual selected from each of the 11 districts by their respective vice presidents. Each year, a new class is inducted into the AMA Model Aviation Hall of Fame. As of the end of 2019, there were 342 inductees in the Hall of Fame.

To view the criteria for nomination, to nominate a person online, or to download a PDF nomination form, please visit www.modelaircraft.org/form/ama-model-aviation-hall-of-fame. Applications are also available by request by calling (800) 435-9262, ext. 521, or by emailing nominations@modelaircraft.org.

Please read all instructions carefully and follow the rules. Applications will be rejected if not completed properly. The following are a few guidelines for completing the application:

- » Membership in the AMA is not a requirement to be eligible for the AMA Model Aviation Hall of Fame. A person is eligible for nomination if he or she has made the kinds of contributions listed in the statement above. The candidate may be living or deceased.
- » The information provided should focus on how the candidate has contributed to model aviation overall, including specific examples.
- » The number of files received by AMA cannot be more than seven. Your application will be returned if it exceeds that number. Any letters of support not included with the original application will not be considered as part of the original application. Include no more than four files of biographical information. Letters of support, if included, are considered as a part of these four files.
- » Include no more than two images. At least one needs to be of high quality for use in the Hall of Fame Exhibit at the AMA's National Model Aviation Museum.
- » The information provided must be typed for easy reading by the selectors. If the application is not readable, it will not be evaluated.

**APPLICATIONS MUST BE RECEIVED
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To fill out an application online, visit
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20 Freestyle Aerob

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At A Glance



Specifications

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Flight modes: 4
Frame rate: 11 ms or 22 ms
Model memory: 250 internal
Modes: User-selectable Modes 1-4
Modulation: DSMX/DSM2
Range: Full
Receiver: Not included
Resolution: 1024 or 2048
SD card/airware capable: Yes
Telemetry: Yes
Transmitter battery type: Lithium Ion, 10,500 mAh
Price: \$1,399.99

➔ *New Products that are Worth a Closer Look*

SPEKTRUM iX20 TRANSMITTER

THE SPEKTRUM iX20 is the newest Android transmitter and builds upon Horizon Hobby's first Android transmitter, the iX12, which was released in December 2017. Although the iX20 is Android powered, it is much faster and offers some great new features.

Equipped with a 5-inch touch screen that offers a high-resolution, 720p high-definition color interface, Spektrum transmitters have never looked better. It's also equipped with a faster processor, more RAM, and a newer version of Android that has the radio ready for use in roughly a minute. Sleep mode and swapping models is nearly instantaneous.

Its most exciting new feature is probably the capacitive-touch technology. This works with any of the 10 toggle switches, the I-switch button, or gimbal sticks to respond to user-programmed voice alerts without interrupting the programmed mechanical movements that have been assigned.

In essence, you can touch a switch and the iX20 will announce what the switch does and what its setting currently is. If you touched the rate switch, it could report to you what the current rate setting is. Other uses could include confirming the retract switch or providing telemetry data, if a telemetry receiver is used.

The iX20 also brings another first to Spektrum radios: a built-in camera. The 2-megapixel camera is intended to allow a user to photograph his or her aircraft, which can then be seen on the main screen along with the model name. The camera is also capable of taking videos; however, a cell-phone would likely be better suited for the task.

The radio also offers new speech-to-text functionality made possible by Android, which allows you to access and set up custom telemetry warnings, reports, and more through its voice-recognition software.

Another nice feature is the inclusion of a magnetic micro USB adapter that connects to the back of the transmitter to charge the radio. This is handy in case the transmitter is accidentally knocked over or the charge cable catches on something. It allows the cable to easily detach and could save the transmitter from damage.

The Spektrum iX20 has many more features, but the focus of this description was to touch on some of the new features not found in previous Spektrum transmitters. To learn more about the iX20, be sure to watch the *Model Aviation* "First Look" video on YouTube at <https://bit.ly/2PsyBQO>. 🚁

SOURCES:

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website: www.bmjrmmodels.com

The original Perky design was published in an October 1952 *Air Trails* article. It indicated that the aircraft was intended to fulfill requests from Air Adventures clubs, Air Scout groups, schools, and recreation centers. *Air Trails* presented Perky as a rubber-powered trainer that would get a novice aeromodeling fan off to a good start.

BMJR's inspiration for the Perky Jr. came from a Bill Schmidt article in the March/April 2019 *National Free Flight Digest*. The design followed the original model with the exception of an optional smaller rudder to reduce spiral dive tendencies. This was the variant that BMJR used.

The original Perky had a 34-inch wingspan. The Perky Jr. has been scaled to a 21-inch wingspan to provide a 48-square-inch wing area for the Flying Aces Club Embryo event.



Diana 2 SZD-56 (3.7m) Sport Scale Glider @ \$1,045 + S&H from ICARE-ICARUS

890 ch. D'Anjou, unit 1, Boucherville, Quebec, J4B 5E4, Canada;
Tel.: (450) 449-9094;
www.icare-icarus.com

The SZD-56 Diana is a 3.7-meter glider that was originally designed by Bogumil Bereś at PZL Bielsko but was never produced. The design rights were taken over by Diana Sailplanes, which further developed the design and called it the Diana 2. It first flew in January 2005.

The 1/4-scale model is designed for general sport flying with the latest technology, including being made from a mold. It can be flown as a sport Slope sailplane or for Thermal Soaring with its wide speed envelope. It employs an airfoil that is often used in F3B competition models, so it can be flown slowly in thermals, rapidly in speed runs, and at a good glide ratio for distance flying.

The all-molded kit includes a high-quality, white epoxy fiberglass fuselage, with a wing joiner carrying tube installed. The fiberglass-molded and carbon-fiber-reinforced wing comes finished with the control surfaces live-hinged, so no additional work is required except for installing the wing servos and linkages. A clear, plastic canopy and fiberglass canopy tray are included and preassembled. Detailed instructions and a hardware kit are included. Optional retractable landing gear and a tow release are available, as well as complete servo and power combo packages.




Acro FS Aerobatic Flight Simulator from Knife Edge Software

www.acrofs.com

Knife Edge Software and Jim Bourke Airshows have updated Acro FS, an aerobatic flight simulator, with new aircraft and new flying sites. You can try it for free with Steam Early Access. Created by Jim, an air show pilot and member of the US Unlimited Aerobatic Team, it is the world's most realistic simulation of aerobatic flight, with stick and rudder pilots in mind.

Knife Edge's RealFlight RC simulator has been the gold standard for model aviation, with more than two decades of experience with high-alpha aerodynamic models that are required to simulate aerobatic flight. That understanding of aggressive flight is what allows Acro FS to simulate snap rolls, spins, torque rolls, and other advanced maneuvers.

Users with gaming computers can even fly in virtual reality using Oculus or SteamVR headsets. Choose from one of four aircraft: a Super Decathlon, Yak-54, Sbach 342, or Extra 330SC, at four locations: Borrego Valley Airport in Borrego Springs, California (day and night flying); Flight School (day and night flying); Homestead; and Joe's Garage. Also included are high-speed racing and environmental controls such as wind, precipitation, and daylight at your command.

A 64-bit Intel i5, Ryzen 1500, or equivalent processor; Windows 7, 8, or 10 operating system with 2 to 4 GB RAM; DirectX 11 mid-range video card with 2 GB of video memory; and 4 to 6 GB available storage space are required and recommended. 

SANCTIONED EVENT CHANGES MADE

IF YOU regularly check the “Sanctioned Event Calendar” in the back of this magazine each month, you might notice that the event listings are now shorter than in the past. Starting with this issue, all printed Sanctioned Event listings will be pared down to only dates, title, location, and contact information.

AMA and *Model Aviation* will continue to promote events in print, but we are expanding our efforts to satisfy a growing demand for digital and online access.

Before the latest magazine redesign, we conducted magazine readership surveys. Readers were asked what content they read or wanted, and the Sanctioned Event Calendar was rated in the bottom half or third. That didn’t reflect a lack of interest in events! Instead, members wanted more robust features online and in our digital event calendar, which can be found at www.modelaircraft.org/event-calendar.

Although the online event calendar had a rocky launch, it has tremendously improved. We were on pace to receive 250,000 views in 2019, validating that members are demanding more digital access to events. We are also beginning to promote more events through email, social media, and in our videos, as requested by members.

In addition to modifying the length of the event listings, the frequency and prices have changed. Events will be published in two issues of the magazine instead of three. The cost for supplemental black and white event advertisements has increased to \$50. An optional full-color ad can be purchased for \$75.

AMA officials have also decided to increase the cost to sanction an event to \$35 and the cost to publish nonflying events to \$20. This decision was partially driven by increased printing and shipping costs since we last raised the sanctioning rates more than a decade ago. Additional expenses include editorial fees, staff resources to edit and design the magazine calendar, and a sanctions team to process each sanction.

The \$10 rate increase and print changes will not offset these losses, but AMA’s mission is to promote the hobby and events, so we will continue to absorb many of these expenses. We want to invest in you and your events—the core of our hobby!

Additional information about supplemental ads can be found at www.modelaircraft.org/events/competition-resources/supplemental-ad-information.

To sanction an event online, contest directors and event managers can visit www.modelaircraft.org/events/sanctions and log in. If you have questions, contact AMA’s Competition department at (800) 435-9262, ext. 252.

AMA Thanks Its Lifetime Supporters!

The Academy of Model Aeronautics recently welcomed Life Members Austin Wingo, Starkville MS; Jubart Igig, Diamond Bar CA; Darryl W. Ivins, Aberdeen MD; William B. Kersey, Bradenton FL; Jason Dennis Poirier, Union City CA; BJ Sato, San Jose CA; and Vernon Hanbeck, Elgin SC.

For information about becoming a Life Member, contact AMA Headquarters at (800) 435-9262.

—AMA Membership Department

Membership Meeting and Fun-Fly

AMA will hold a membership meeting on July 25, 2020, at AMA Headquarters in Muncie, Indiana. Watch for more details in an upcoming issue of this magazine. During that timeframe, AMA will also host a national fun-fly in Muncie. The event will take place July 24-26. More details will be released closer to the time of the gathering.

AMA EXPO ENDS



The AMA booth at the AMA International Modeler Show Convention, circa 2000. (Source: #0001 AMA Collection, National Model Aviation Museum Archives.)

AFTER A 20-year run, AMA Expo has come to an end. AMA officials announced the decision at AMA Expo West 2019, held November 1-3, in Pomona, California, after the AMA Executive Council voted to end the show. AMA Expo East, held in Secaucus, New Jersey, also will no longer take place.

In 1999, AMA acquired what was then known as the International Modelers Show (IMS) from Bill and Anita Northrop. The couple founded the event in 1978, with the first IMS held at the Los Angeles Convention Center. They later moved it to Pasadena, California, where it was held for 20 years until AMA acquired it.

After AMA purchased the show, its name

was changed to AMA International Modeler Show Convention then to AMA Expo. For many years, the trade show was held at the Ontario Convention Center in Ontario, California, traditionally taking place in early January.

In 2018, AMA Expo West was held twice. The first was held in January in Ontario. The show was moved to the fall in hopes of attracting Christmas shoppers. The second AMA Expo West that year took place November 2-4 at the Pomona Fairplex in Pomona. The new venue also provided space for outdoor flying. The event was again held in Pomona in November 2019.

In 2016, AMA acquired the Westchester Radio AeroModelers (WRAM) Show and it was renamed AMA Expo East. The final AMA Expo East was held in February 2019.

Since Bill and Anita first established the California trade show, the aeromodelling industry and how modelers shop have changed tremendously. When the event began, AMA members would travel from far and wide to the show to catch a glimpse of the newest products in the industry. Rows and rows of vendors had booths to display their new products, with the hopes of exciting potential and returning customers.

Years later, there was a boom in e-commerce. Instead of only seeing new products at trade shows, hobby shops, or in magazines, shoppers could find and purchase them online. Across the country, attendance and exhibitors at hobby trade shows began to dwindle.

In lieu of hosting national trade shows once a year in Southern California and New Jersey (AMA Expo East), AMA has decided to explore multiple district events across the country in 2020 and in the years to follow. This will allow AMA to serve and impact more members. This new approach embraces elements of Expo West such as the fun-fly and educational opportunities.

If you live in Southern California, look for details on the District X Fun Fly that is tentatively slated to be held at the Las Vegas Radio Control club in October 2020. We will provide more information in the coming months.

AMA thanks all of the members, sponsors, and exhibitors who have supported AMA Expo throughout the years. Also, thank you to those who have volunteered at our shows and to our many guest speakers.

We extend a special thank-you to those who sponsored AMA Expo West 2019: eHobbyHouse.com (presenting sponsor); HobbyKing, Horizon Hobby, Scorpion Power System, Power Heli, U.S. Scale Masters, Desert Aircraft, EMAX USA; and our partners, EAA, Pegasus Hobbies, Knights of the Round Circle, Inland Pacific, NAMBA International, Blacksheep Exhibition Squadron, The Scale Squadron of Southern California, Southern California Rocket Association, Orange Coast RC Club, International Drone Racing Limited Co., U.S. Air Force JROTC, Embry-Riddle Aeronautical University, Soaring Society of America, and RC Roundtable.

Thanks also to our 2019 AMA Expo West exhibitors: AeroForm CNC Foam



The AMA Convention in 2007.

Cutter; AFJROTC; AGM LLC; Airborne Models; American STEAM Education Technology Inc.; Antique RC Radio Collection; AZ Joeheads; Black Sheep Squadron; Bob Smith Industries; BrainFPV LCC; calorr.com; Civil Air Patrol; Common Sense RC; Dave's R/C Electronics; Desert Aircraft; eHobbyHouse; EMAX/Yinyan Tech US Inc.; Embry-Riddle Aeronautical University; E-Power; Experimental Aircraft Association; FAA Safety Team; FrSky RC, Inc.; Futaba Corporation of America; Golden Skies R/C Aircraft; Graupner; Grex Airbrush; HiDow; Hobby Club; Hitec RCD; Horizon Hobby; House of Balsa/ZAP; IDRLC; In2Hobby, LLC; Inland Nautical Society; Iris Automation; JR PROPO/Dee Force; Kinetic Composites; King Schools; Knights of the Round Circle; LR Luxury DBA Pura Vida; Maxford USA; Menifee Valley Flyers; MikeGoesFlying.com; NASA Armstrong Flight Research Center; National Society for Radio Control Aerobatics; NewBeeDrone; NHB; N-Land Pacific Free-MoN; North American Model Boat Association (NAMBA); NorthWest RC; Orange Coast Radio Control Club; Oxidean Marine; Pegasus Hobbies; Reefs RC Products; Roaring Top Battery; Rogue Squadron; Sail Propeller USA; San Fernando Valley Flyers RC Club; San Gabriel Valley RC League; Scale Squadron of Southern California; Scorpion Power System USA; SF Drone School; Slimline; Soaring Society of America; SoCal Hobbies; Society of Antique Modelers; Southern California Rocket Association; Spearhead Armor Group; Stevens AeroModel; Sullivan Products; SupaQuad; SuperTite Adhesives; Team Legit; The Paper Airplane Guy; The RC Geek; U.S. Scale Masters Association; Victor Valley RC Flyers Inc.; Warbird Pilots; Wings West RC; Wuxi R2TECK CO., LTD; and Xtreme Power Systems. 

FILMMAKER, AMA MEMBER HONORED




AN AMA LIFE MEMBER has been honored by AMA for his work to promote the hobby through films.

Jay Gerber, who worked for NFL Films for many years, visited AMA Headquarters in Muncie, Indiana, on November 13, 2019. That afternoon, he was given a plaque and learned that AMA's multimedia studio was now named the Jay Gerber Commemorative Studio. He was clearly touched by the honor.

Jay has produced several videos throughout the years that showcased model aviation and how fun the hobby can be. He was interviewed by *Model Aviation* in 2013 and stated, "Modeling had a significant impact on my 46-year career with the National Football League (NFL)."


"The technological advancements that I brought to the NFL had roots in modeling. Trying to get the escapements and reed controllers working and learning about radio frequencies led to innovation at the NFL."

Jay was inducted into the AMA Model Aviation Hall of Fame in 2015. He favors Pattern-style model airplanes. You can watch some of the films that he produced about aeromodeling at www.modelaircraft.org/amafilms or read more about Jay in "I Am the AMA" in the April 2013 issue of *Model Aviation*. 



THE AMA Executive Council has approved the schedule for the 2020 National Aeromodeling Championships (Nats). Free Flight Indoor events will be held on May 27-31, 2020, at the Round Valley Aerodrome, in Springerville, Arizona. All Outdoor Nats events will be held at the International Aeromodeling Center in Muncie, Indiana.

Indoor Free Flight: May 27-31
RC Scale Aerobatics: July 12-15
RC Pylon Racing: July 12-18
Control Line (Navy Carrier, Precision Aerobatics, Racing, Combat, Speed): July 12-18
Control Line and Radio Control Scale: July 16-19
RC Aerobatics (Pattern): July 19-23
RC Soaring: July 23-August 2
RC Combat: July 24-26
FF Outdoor: July 27-31
RC Helicopter: August 2-5

If you have participated in the Nats within the last two years, you will receive an email letting you know when registration is open. Watch for updates at nats.modelaircraft.org. 

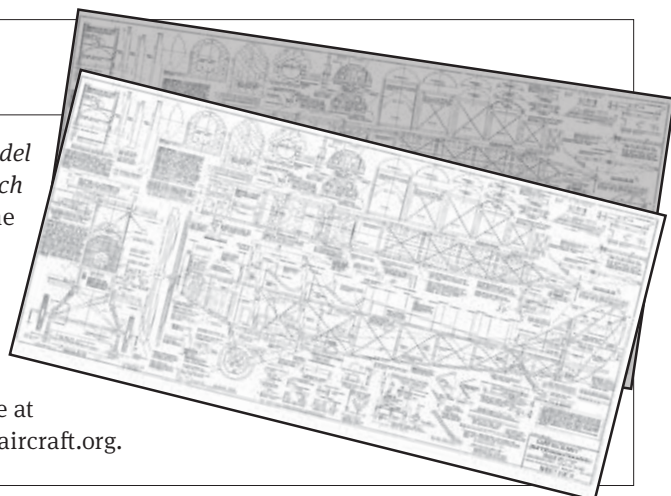


Detailed Scale Plans

AMA PLANS Service houses all plans formerly sold through *Model Builder* magazine, Bill Northrop's Plan Service, and the *Scratch Builder's Almanac*. There are more than 1,000 plans in the collection.

Detailed scale plans of the 87-inch Curtiss Jenny JN4-D2 are available and come printed on three large plans sheets. The aircraft, designed by Ralph Beck, has a 55-inch fuselage.

You can order plans for the Curtiss Jenny, plans number 61018, for \$40 plus shipping and handling by calling AMA Plans Service at (800) 435-9262, extension 507, or via email at planservice@modelaircraft.org.



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Above: Dr Shabat (L) and Adam Krawiec (R), from Israel, both launch their F1B models. Right: A Chinese team member gets ready to launch Zhang Zhiyong's F1A glider.



FREE FLIGHT WORLD CHAMPIONSHIPS

*International
competition
returns to Lost
Hills after 18 years*

By **Jace Pivonka**
Photos by **Brian Furutani**
jpivo3@sprynet.com

It has been 18 years since the 2001 Free Flight World Championships took place on US soil in Lost Hills, California. The 2019 FAI World Championships for Free Flight Model Aircraft was held once again in Lost Hills. Head juror Ian Kaynes described it as the largest world championships in the western hemisphere. It was truly a sight to behold with 38 countries coming together from around the world to compete.

Since the last World Championships in Lost Hills, there have been many changes. The biggest of these is the orchards that have started to close in from the south and west sides of the field. When they were originally planted, they were much shorter than the 15-plus feet high that they are now. Although the trees are rarely a problem for fliers because of the fabled low drift of the Lost Hills flying site, it was almost guaranteed that they would become a factor before the week was over.

One thing that hasn't changed much is the overall size of the Lost Hills truck stop where many US supporters and team members stayed, as did a few members of other teams. There are still only two hotels and a few fast-food restaurants. A little farther from the highway, in the town of Lost Hills, is a small grocery store, as well as Gabby's Grill & Café, that catered delicious food to the competitors all week via a food truck on the field.

FREE FLIGHT WORLD CHAMPIONSHIPS



01



VIEW MORE EVENT PHOTOS!

Access additional content by visiting www.ModelAviation.com/bonuscontent.

01. CD Charlie Jones speaks at the opening ceremony.

02. Oscar Findahl, of Sweden, helps launch an F1A towline glider.

03. Peter Mönninghoff, of Germany, gets ready for the day.

The town of Lost Hills recently received a new park complex from the Wonderful Company, the makers of Wonderful Pistachios. Wonderful Park was the site of the opening and closing ceremonies, as well as model processing. The festivities officially kicked off on Tuesday, October 15, although many fliers had already been there for several days or more for testing and becoming accustomed to the field's weather conditions.

On Tuesday and Wednesday, competitors came to Wonderful Park with their teams to process their models. Thanks to the contest organizers, this went off without a hitch.

Working with the Holloway Gypsum Company, the organizers also did a fantastic job of setting up the field before competitors arrived. Holloway graded the RV area and parking lot, as well as the drives to the various flightlines.

The contest directors (CDs) set up three flightlines that accounted for the most likely wind directions. Each flightline had plenty of poles as well as a 5-meter line marked on each side of the poles.

Thursday's opening ceremony in Wonderful Park featured the Lost Hills High School band playing as the teams marched across the soccer field. Lost Hills High School was thoroughly involved in the opening ceremony, with students from the school holding signs for each country to stand behind. After the competitors found their respective places, CD Charlie Jones introduced each country.

The World Championships were preceded by the Sierra World Cup and followed by the Kotuku World Cup. The two contests, as well as a third held in Las Vegas the weekend following the World Championships, increased attendance. After each country was recognized, the Sierra Cup awards were presented then the US national anthem and FAI anthem were played as the FAI flag was raised. The competitors' and timekeepers' oaths were read aloud and, finally, Ian declared the contest to be officially open.

The teams had a few hours to return to their hotels before the timekeepers reported to a meeting. In previous world championships, timekeeping has been one



02

of the biggest challenges faced by the contest management. Although that was no different this year, a significant amount of help came from the US in the form of volunteer timekeepers. Because the contest was held on US soil, many FAI fliers from across the country attended, helping the timing go smoothly.

The results were posted live online, thanks to a lot of work behind the scenes.

Rounding out Thursday night, the team managers and assistant managers met to get rule clarifications and make sure that every team was on the same page. The meeting determined that a group of teams planned to use the new altimeter flyoff rule, which involves ensuring that the altimeter data to be presented was created during the flyoff flight instead of data that had been previously recorded. This rule led to a funny altimeter calibration dance before the beginning of the flyoff window, where competitors had to raise their models above their heads then lower them to the ground in a pattern specified by the CD.

Friday began with cool temperatures and a stronger breeze than what had been seen during most of the practice days. F1A began with 103 competitors, which was pared to only 33 by the end of the seventh round. Round two saw the fall of US flier Ken Bauer, and round seven took Mike Thompson out of the flyoff.

Among those in the 6-minute flyoff was Jim Parker of the US, who managed to max the round despite a malfunctioning timer and the model looping after detaching from the line. He joined the 20 other sportsmen who maxed the first flyoff in the 8-minute flyoff later that evening. By 5 p.m. there was little thermal activity and maxing the 8-minute flyoff was challenging.

Jim flew his backup model and finished in 16th place. Only three fliers made the max, setting themselves up for a 10-minute flyoff the following morning. The F1A



flyoff ended with Constantin Brinzoi, of Romania, on top of the competition. The Russian team found itself on top of the podium in team scoring.

F1B day saw 97 competitors start the day but after a long and hard set of seven rounds, 41 fliers remained in the competition, including the US team's Blake Jensen. The day saw lots of wind shifts, leading to challenging thermal picks, as well as frequent dust devils in the afternoon rounds. These challenging conditions claimed both Alex Andriukov and Greg Simon of the US team in the second round.

With 41 competitors in the 6-minute flyoff, the line stretched out 410 yards, creating different thermal conditions for competitors depending on their location. Blake was in approximately the middle of the line and, despite a nearly perfect climb, his model never found the right air and only did 5 minutes and 14 seconds—46 seconds short of the max. Most of the maxes came from the ends of the line and almost no one in the middle was able to survive to reach the 8-minute flyoff.

This flyoff saw most of the competitors launch almost immediately, which unfortunately led to all but three of the remaining competitors dropping the round. Sunday started off with the 10-minute F1B flyoff, which ended with Mickael Rigault of France taking the win despite all

of the models in the flyoff drifting into the orchard. The F1B team trophy was awarded to the team from Israel.

Sunday began with the classic buoyant air of Lost Hills. Many of the F1C aircraft easily made the 4-minute max in the first round, but as the weather began to transition in the second round, Jeff Ellington, of the US, missed the max by a few seconds, removing him from the running.

As the day continued, the wind picked up and dust devils started rolling through the flightline. The wind increased throughout the rounds as Faust Parker and Taron Malkhaysan of the US team remained clean. Because of the strength of the wind, the flyoff was postponed until 5:30. Of the 23 fliers in the 6-minute flyoff, 16 made the max, including both remaining US team members.

The following morning, the 10-minute flyoff began at 7:30 with perfect conditions. Five minutes into the round, Taron launched and had a perfect climb and transition. Faust was able to get his backup model in the air to finish in eighth place.

Meanwhile, Taron floated overhead with no drift in slightly positive air. When the model landed after 9 minutes and 54 seconds, he was the new world champion. When the model was back on the flightline, it

04. Per Findahl, from Sweden, launches his F1A towline glider.

05. Team USA placed third in the team competition.

FREE FLIGHT WORLD CHAMPIONSHIPS



06. Lu Hong, of China, launches his rubber-powered F1B model.

07. The flightline was 380 meters long. The national flags on the flightline help the retrieval crews downwind spot their team's models when they are launched.

08. Roel Lucassen of the Netherlands is getting ready for the F1B event.

was taken to processing. Despite a long wait, all of Taron's models passed and he was officially declared the world champion.


With all of the flying completed, most of the competitors turned to socializing. Jim Parker hosted a barbecue for all of the competitors. The event featured a live band formed by a couple of modelers and many people stayed on the field until well after dark.

The following day saw the closing ceremonies take place in Wonderful Park and the awards were presented to all of the individuals and teams who placed, as well as the Challenge France trophy, which goes to the team with the best total score across all events. This year, Poland took home the trophy, closely followed by Russia, with the US finishing in third place. After the awards presentation, Ian officially closed the contest.

Later that evening, all of the competitors and supporters flocked to Buck Owens' Crystal Palace in Bakersfield, California, for the banquet. At the banquet, fliers exchanged shirts and other goodies in between dancing and eating delicious food. There were line dancing lessons while a live band performed and sang

everything from country to blues. At one point, a few modelers got on stage and performed the altimeter dance to make fun of competitors preparing for flyoffs.

The amount of work that took place in the 2 years leading up to this contest was tremendous and its execution was nearly perfect. There were no formal protests posed to the jury, and there were no timekeeper errors or complaints.

Thanks to all of the work of the CD and his assistants, as well as the people who worked behind the scenes to put on this contest, the 2019 Free Flight World Championships went off without a hitch. 

SOURCES:

FAI
www.fai.org

2019 FAI F1ABC World Championships for Free Flight Model Aircraft
www.modelaircraft.org/events/fai-2019-f1abc

National Free Flight Society (NFFS)
www.freeflight.org

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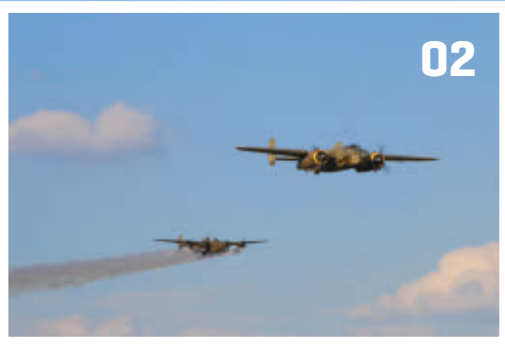


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03



01. An F9F Panther flown by Dave Chew comes in low and slow down the runway.

02. Steve Forrest's B-24 Liberator (L) with smoke on tails a B-25 Mitchell.

03. A P-47 Thunderbolt Tarheel Hal comes in for a landing as the sun begins to set.

04. A Constellation rests in the pit area.

WARBIRD *of the*



S and **CLASSICS** **BLUEGRASS**



04

*A Giant Scale
contest with
a lot of heart*

By Rachelle Haughn
Photos by the author
rachelteh@modelaircraft.org

The history that goes with the aircraft being flown, the memories of days gone by, the smallest details, and the work that goes into creating something flyable out of balsa and glue is what draws pilots and spectators to warbird fly-ins.

The Warbirds and Classics of the Bluegrass is no exception. Like others in the Warbirds and Classics Alliance, this event can make pilots feel as though they have just stepped back in time to get a glimpse of aircraft dogfighting and completing bombing runs in the sky. And the best part is that they get to do so with their friends and family.

WARBIRDS AND CLASSICS OF THE BLUEGRASS

05



07



06



08



05. Dale Arvin's Piper Cub comes in low. Dale is the president of the Rosewood RC Flyers club.

06. Jim Suchy took home the Best Classic award for his Boeing P-26 Peashooter.

07. Brian Ward's 70.75-inch Fokker Dr.I triplane was built from a Balsa USA kit.

08. Jimmy Davis (L) flies as Mike Barbee spots for him.

"It's as much about building and flying the planes as it is the history," John McDill, co-contest director (CD) of the Warbirds and Classics of the Bluegrass, said about the event.

He added, "This group of people, it's like family. They like to be together. They love gagging on each other."

A variety of Giant Scale World War I, World War II, and classic aircraft were flown at the September 26-28, 2019, event. They included some frequently modeled airplanes, such as a Piper Cub, and some rare ones, including an F7F Tigercat Bad Kitty. Their builders were happy to share details about their aircraft with spectators.

Behind the flightline, pilots and their family members could be found helping each other, catching up with friends, cooking meals for each other, and having fun. Many didn't hesitate to offer someone a chair in the shade or cool water to drink when the temperature hovered at 95°. People were happy and relaxed and the flightline stayed full from dusk to dawn throughout the contest. The event was held at the home of the Rosewood RC Flyers.

The Rosewood, Indiana, flying site is located just off of a scenic road that snakes along the Ohio River that

creates the Indiana/Kentucky state lines. Signs along the road for those traveling from nearby Elizabeth, Indiana, helped guide pilots and spectators to the flying site.

When pilots who had never been to the site arrived, they likely were surprised by how nice it is. Like many model aircraft flying sites, it has a paved runway, parking, and covered shelters. Unlike others, the runway is 800 feet long! There is also a paved parking area, a concrete pad and shelter for concessions, concrete model helicopter pads, and 275 sprinkler heads to keep the 24 acres of well-manicured grass in pristine condition.

"We have a beautiful site and we want to use it," stated John, who is a member of the Rosewood RC Flyers. He added that five large events were held at the

Southern Indiana flying site in 2019. He also shared how the site came about.

In 2006, an Indiana entrepreneur and model aircraft pilot learned that the land where he had been flying with a group of roughly six members of the Southern Indiana RC Modelers was purchased by Duke Energy. The company planned to build a power plant on the land, so the club had to move.

Down the road, the unnamed entrepreneur found a 110-acre lot for sale and purchased it. His goal was to create a flying field for jet aircraft for himself and the small club.

In 2007, work to develop the land into a flying site began. Eighty-six acres of the property was rented to a nearby farmer, and the remainder would be used by the club. The plan was to construct the runway, four paved taxiways, and five flight stations. Large equipment was used to move enough dirt to get the runway and flight stations above the 100-year flood plain. A paved driveway would also be created.

Later that year, members of the new Ohio River View RC Flyers club took off for the first time at the flying site. By 2010, the club had grown and held its first major event, the U.S. Scale Masters Championships.

More development took place, including adding two more concrete pads with covered shelters and adding electricity and a well to the site. The well was designed to pump water to the sprinklers.

In 2017, the developer met with three of the club members and told them that because of age and his growing business, he could no longer be involved in the flying field's operations. The club was tasked with creating a plan to maintain the field, and the entrepreneur deeded the land to the club. As part of the agreement, the club must keep the entrepreneur's anonymity.

On January 1, 2018, a new club, the Rosewood RC Flyers, was created. Later that year, the club's flying site was chosen to be one of the newest sites for a Warbirds and Classics Alliance event, Warbirds and Classics of the Bluegrass. At the inaugural event, there were roughly 50 pilots. In 2019, the contest grew to 56 pilots and more than 100 aircraft of all scales.

"This flying site brings in guys and planes that are above and beyond what you might normally see," club member Tim Evans said. Because of the length of the runway, pilots have adequate room to fly Giant Scale aircraft and jets. "A lot of people from as far away as Cincinnati come here to maiden," Tim added.

John noted that many of the club members work hard to maintain the flying site. They also maintain friendships with the River City Radio Controllers of Louisville, Kentucky. Members of the Rosewood RC Flyers often attend events at the Louisville club, and vice versa. Warbirds and Classics of the



Bluegrass is one such event.

Jim Schroder, a member of the River City Radio Controllers, was one of a handful of club members who was at the Rosewood event. He brought and flew a scratch-built 1/2-scale Pietenpol Air Camper with a 14-foot wingspan. Jim and his fellow club members, John Monsour, Doug Blakeman, Tim Evans, and Doug Bailey, spent three months building the aircraft. The airplane garnered attention on the ground and in the air.

"The 1/2 scale was kind of a challenge," John said. "The scheme matches [a full-scale] one at Oshkosh [AirVenture]." The group has also scratch-built the Pietenpol in other scales.

"There are a lot of scratch-builders here," Doug Blakeman said about Warbirds and Classics of the Bluegrass. He added that the group of builders was considering building a World War I biplane next. They enjoy building together because of the camaraderie. "Everyone is so helpful. Everyone contributes. Everyone has their own set of skills," Doug added.

The skill it takes to build Giant Scale model aircraft apparently doesn't solely belong to members of the Louisville club. The Rosewood contest drew builders and pilots from other states. It was clear that a lot of time and love went into perfecting the fine details of their aircraft, which were scratch-built, plan-built, or built from kits.

09. This 1/2-scale Pietenpol Air Camper's scheme was designed to match one seen at EAA AirVenture in Oshkosh WI. It was built by five members of a Louisville club and it bears their names.

10. Ron Pound (L) and Tim Schurick check out several aircraft parked near the flightline, including Dennis Cranfill's F3F Tigercat Bad Kitty. The old Joe Bridi design has a built-up wing, fiberglass fuselage, and a foam tail. It has two Saito FG84R3 radials (updated by Ray English) turning 24 x 12 Falcon propellers and Robart electric retracts with pneumatic brakes.

WARBIRDS AND CLASSICS OF THE BLUEGRASS

11



VIEW MORE EVENT PHOTOS!

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11. Carl Bachhuber's 180-inch Lockheed Constellation almost looks like the full-scale one in the sky.

12. The flight of Lee Watkins' German-captured Nieuport 17, built from a Balsa USA kit, was illuminated by the sunrise during a dawn patrol flight.

One such example was Carl Bachhuber's 230-inch Convair B-36b Peacemaker. The Wisconsin resident scratch-built the six-engine model by studying photos of the full-scale aircraft that he found in a magazine. Carl spent approximately seven months building the airplane. He tries to scratch-build one model aircraft per year.

When asked what attracts him to Giant Scale models, Carl said, "Mainly because there's a reasonable amount of craftsmanship" that goes into them.

A small piece of the Convair that helps control one of the propellers broke and it could not be flown at the Rosewood event, but Carl had a backup. He had packed his 180-inch Lockheed Constellation, which is roughly 1/8 scale, and he flew it several times.


The full-scale Constellation was used for military transport during World War II. Sharing the sky during that time period were bombers, which were also represented at Warbirds and Classics of the Bluegrass 2019.

Whenever there was room, pilots squeezed in gaggles, including a P-51 gaggle, a bent-wing gaggle, and groups of WW I and WW II aircraft flying in formation. Some included bomb drops and smoke.

Lee Watkins put a fun spin on his Stuka and dropped Nerf "bombs" during the bent-wing gaggle.

On the final day of the event, some fliers rose before the sun to fly a WW I dawn patrol. After they landed, some posed on the runway with their Balsa USA aircraft for a photo.

Next in the sky was Jeff Stubbs' Royal Air Force BAe Hawk. The 1,375-scale aircraft is powered by a KingTech K-260 turbine engine and weighs 63 pounds at takeoff. Jeff mostly flew this aircraft and his other BAe Hawk with a Royal Saudi Air Force scheme after other aircraft had landed.

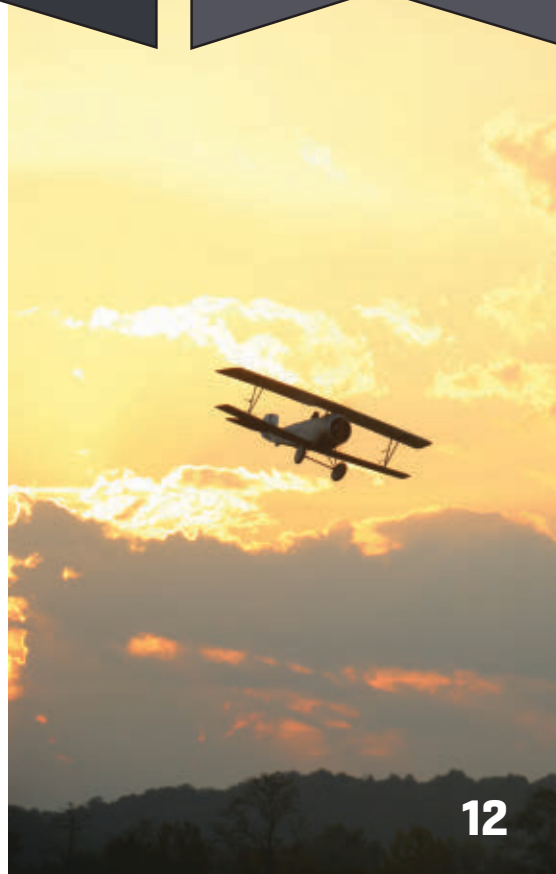
At the end of the final day of the contest, John and Allen Whitaker, his co-CD, handed out awards. Afterward, most began their journeys home, but a few, such as Lee and his friend, John Howell, continued to fly. 

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CONTEST WINNERS

Best World War I: Sean Cassidy, Siemens-Schuckert D.IV
Best Classic: Jim Suchy, Boeing P-26 Peashooter
Best World War II: RJ Monroe, PT-17 Stearman
Best Multi-Engine: Steve Forrest, B-24 Liberator
Best Jet: Jeff Stubbs, BAe Hawk in Royal Saudi Air Force scheme
Best of Show: Mathew Teresinski flying his Corsair, Fokker D.VII, and other aircraft.



12

SOURCES:

Carl Bachhuber's Airplanes
www.carlb-rcplanes.com

Warbirds and Classics Alliance
<http://warbirdandclassics.com>

Rosewood RC Flyers
www.rosewoodrc.com

River City Radio Controllers
www.rcrcy.com



The Hangar 9 CubCrafters XCub is finished in an authentic trim scheme with scale detailing that makes this model stand out.



WATCH A VIDEO ONLINE!

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OFFICIALLY LICENSED XCUB PROVIDES VERSATILITY

Horizon Hobby Hangar 9 CubCrafters XCub 60cc ARF

By **Tony Stillman** | fsac@modelaircraft.org
 Photos by **Matt Ruddick** and the author

I RECEIVED WORD that *Model Aviation* Executive Editor Jay Smith wanted me to review this airplane for the magazine. Hey, everybody loves a Cub, right?

When I received the Hangar 9 CubCrafters XCub, I was impressed with its size and the pretty lines and color scheme! This is not just another Cub! In fact, this is an officially licensed XCub with cool, tundra-style tires that is designed for great Short Takeoff & Landing (STOL) performance.

Upon opening the box, it was apparent that this is a really *big* airplane! It is actually 1/3,5 scale. In order to lay out all the items for pictures for this review, I had to take it outside of my building shop. There is not enough open space in my shop for all of these big pieces!

Each component was individually bagged and carefully placed in the box to eliminate shipping

damage. The kit box was inside a heavy cardboard shipping box to reduce damage.

I started by unwrapping the items and inspecting them for damage. All of the parts checked out great with no damage and little need to reshrink covering ... just a few spots in the corners. After verifying that all of the items were included, it was time to assemble this model!

The instruction book is large, but it is in multiple languages, so you are only using roughly a quarter of the manual. It includes the recommended items you will need depending on whether you choose to power it with gas or electric. My airplane was supplied with an Evolution 62GX engine, so gas was my choice! I prefer gas on my larger aircraft.

I suggest that you plan what you are going to need for your airplane. Because I was using a gasoline engine, I ordered a propeller, an optical

REVIEW

The XCub is capable of more aerobatic qualities than an average Cub. The airplane tracks well, rolls nicely, and turns without using coordinated rudder. In fact, it flies much like an aerobatic model!

ignition kill switch, and made sure that I had all of the recommended glues and adhesives on hand.

I used a Spektrum 2S 4,000 mAh LiPo battery receiver pack and a 2S 2,700 mAh LiPo battery pack for the ignition. If you are using electric power, make sure that you have the motor and other extra items that you need.

You will need some extensions for the aileron and flap servos. These are noted in the manual, so you can check your stock, or order what you need. You might also need some nose weight. I added the recommended 1.5 pounds of lead to the nose to balance the aircraft.

In reading ahead in the manual before starting the build (you do that, don't you?), I found that the XCub offers an optional set of sprung landing gear. The stock gear would work fine, but after looking at these, I had to get them. They are only \$59.99. Believe me, you will want these!

Assembly

The manual starts with epoxying the fiberglass control horns into the slots in the ailerons, rudder, and elevator halves. Remove some paint from the horns where the glue will be applied before assembly.

The aileron servos mount on prebuilt trays that screw into the wing. Install the long extensions on the aileron servos then install the correct length heavy-duty servo arm, being sure to first center the servo with your transmitter. After you screw these plates in place, add the control horns to complete the step.

Now move on to the flaps. The flap horn is internal in the leading edge of the flap, so you install the servos onto the mounts, again being sure to set the flap servo arm properly with your radio before final assembly.

Add the flap pushrod and verify proper



The kit contents as they come out of the box—this is one big airplane!

operation. The flaps and ailerons were already prehinged at the factory to reduce your building time! Add the flap pushrod cover on the top of each wing half then mount the lenses to the landing lights on each wing half using canopy glue. Set the assembly aside to cure.

Now move on to the landing gear. Because I purchased the optional sprung undercarriage landing gear, I followed those assembly instructions. The supplied wheels have a great-looking metal hub.

Installing the wing struts requires installing the wing on the fuselage then attaching all of the strut mounting components and strut fairings on the wing and fuselage. Quite a few steps are involved, but the process is straightforward.

Make sure that you use the correct bolts and locknuts where required because several sizes are included in the kit. After the struts are installed, you only have four 2.5 mm bolts to unscrew from the bottom of the airplane to remove the wing struts.

Assembly and disassembly take approximately 10 minutes at the field.

With the wing on the fuselage, it's time to install the horizontal stabilizer. Slip it into place and mark the stabilizer where it exits the fuselage on both sides, top and bottom, so that you can remove the UltraCote, giving the epoxy something to grab onto.

Use a heat iron to reattach the UltraCote to the stabilizer. This will keep the film from hanging onto the fuselage when you slide it in to glue it permanently. Carefully check the alignment of the stabilizer to the wing. Using a ruler, ensure that it is square to the fuselage and parallel to the wing.

Next comes assembling the fin to the fuselage. Test-fit the fin and mark where to remove the film and reattach it. Do a final test-fit, ensuring that all is square with the stabilizer and wing before you epoxy it in place.

Hinging the elevators and rudder is standard procedure, but if you have not used

this type of hinges, follow the instructions closely and you will do a fine job. Don't forget about the navigation light in the rudder. Make sure you test-fit the light before installing the hinges on the rudder.

My kit required me to slightly enlarge the hole for the light. Check yours then install the light into the rudder and set it aside. Let it cure before hinging the rudder. After the glue has set, you can move on to the radio installation.

The two elevator servos, along with the single rudder servo, are installed on the bottom of the fuselage under a hatch. Install the grommets in the servos and mount them according to the instructions.

The receiver also mounts in this area. The radio switch has several options. You can mount it on either side of the airplane using the pre-cut mounts, or it can be installed inside the cockpit between the seats. This way you can open the door on the airplane to operate the switches and you won't see anything on the outside of the aircraft. With the servos, receiver, and switch installed, it's time to assemble the pushrods.

Hangar 9 supplies some nice hardware with this kit, including ball links on all of the pushrods and the pull-pull rudder. This yields solid control with no slop. It's nice to not have to replace poor hardware!

For the rudder, assemble the ball links to the provided threaded studs and attach them to the control horns on the rudder and on the servo arm. It's important for the arm to be the recommended length for proper geometry. Otherwise, you will have issues with the cable becoming loose or tight when you move the servo.

After the ball links are installed, run the steel cable through the tubes and attach to each ball link end. I recommend that you turn the radio and receiver on, powering the servo at neutral while you pull the cables tight. Make sure you have some adjustment left in the ball links to tighten the cables if necessary. Using crimping pliers, firmly crimp the sleeves. Check your work and make any needed adjustment in the cables.

For the elevators, assemble one ball link onto the provided threaded rod and slide it into place from the servo end. Connect the ball link to the servo horn then thread the other ball link onto the elevator end.

Slip the elevator horn onto the servo, ensuring that it is at neutral. Again, with the radio on, adjust the elevator ball link so the elevator is at neutral. Do this for both elevators.

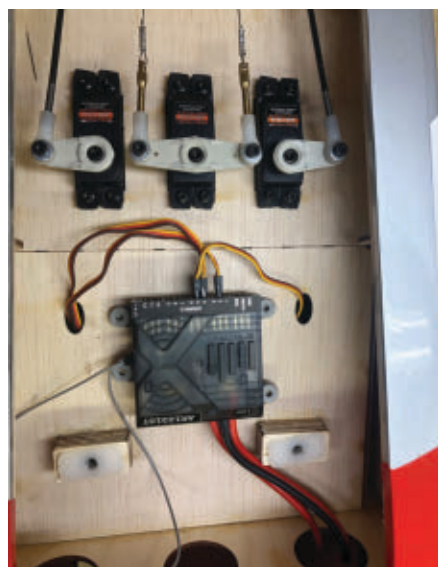
With the rudder and elevators done, it's time to install the tail wheel. Follow the instructions and attach the spring as shown to allow the tail wheel to absorb shock while taxiing and landing.

While still working at the back of the model, install the tail bracing using the steel cable and clevises. Crimp the sleeves using crimping pliers.

Horizon Hobby supplies motor mounts for both gas and electric powerplants, so simply follow the instructions to build up your mount for your specific type. The mount includes a built-in fuel tank mount or a battery mount, depending on what your setup is. After you complete the installation, the motor mount assembly bolts into the airplane with four bolts and blind nuts.

If you are installing a gasoline engine, add the throttle servo, pushrod, and the choke pushrod. You can install a choke servo if you like. Horizon Hobby designed the airplane so that the choke pushrod can come through the instrument panel, and you can easily access it through the airplane's door.

Final touches include installing the supplied seats and windows. After that is



Here are the elevator and rudder servos, along with the Spektrum AR12310T receiver. These are nicely tucked away under a panel on the bottom of the fuselage behind the cockpit area.



At A Glance



Specifications

Model type: Semiscale ARF

Skill level: Intermediate

Wingspan: 116 inches

Wing area: 1,908 square inches

Wing loading: 35 ounces per square foot

Length: 82 inches

Weight: 27 to 31 pounds

Power system: 50cc to 70cc gasoline or electric Power 360 motor and ESC

Radio: Eight servos required, nine if using ignition kill; minimum six channels recommended

Construction: Balsa and plywood

Covering/finish: UltraCote

Price: \$899.99

Test-Model Details

Motor/engine used: Evolution 62GX

Receiver battery: 2S 4,000 mAh LiPo

Propeller: 23 x 8 Xoar

Radio system: Spektrum AR12310T receiver; eight Spektrum A5160 servos

Ready-to-fly weight: 30 pounds

Flight duration: 20-plus minutes

Landing gear: Optional set of sprung landing gear (part HAN526024)



Pluses

- Well designed with excellent detail.
- Quality hardware included.
- Nice aluminum struts.
- Detailed interior.
- Easy assembly.



Minus

- Articulating landing gear must be purchased separately.



Manufacturer/Distributor

Horizon Hobby/Hangar 9

(800) 338-4639

www.horizonhobby.com

REVIEW



Note the aluminum wing struts! They are a nice touch and are functional.



The wing is attached to the fuselage with four 1/4-inch nylon screws. Access is through the removable hatch on the top of the fuselage, making installing it quick and easy.

completed, install the cowl and attach the spinner to your choice of propeller. Make sure that you have everything tight and use Loctite where recommended.

Because this is a big airplane, many of you might want to use it as a glider tug. Horizon Hobby included the fittings that are needed to rig the model for that task, including a towhook. If you use this option, simply follow the instructions. Make sure you have the extra servo needed to operate it!

Finally, install the scale antenna mast and decals to complete the model. Make sure you check the center of gravity and all of the connections before your test flight. Follow the recommended control throws, especially for the first flights.

It flies like a Cub, but with more aerobatic qualities than an average Cub! The airplane tracks well, rolls nicely, and turns without using coordinated rudder.

Flying

I followed the manufacturer's recommendations for breaking in the Evolution 62GX engine, so it was ready to go when I installed it. I knew I would be test-flying the airplane late in the year, so I was

looking for a good weather window in which to fly. I found an opening in early November when the temperature was in the mid-50s with mild wind.

After fueling the X-Cub, I rechecked all of the controls then fired up the Evolution 62GX. With it running reliably, I set a nice, low idle and started my taxi. The tail wheel works well, and the nice, wide landing gear stance made taxiing easy. I turned into the wind and applied power. The X-Cub jumped off the ground in approximately 30 feet! I was slightly surprised at how quickly it got into the air, but it is designed as a STOL model!

I quickly powered back to roughly half power then put in a little trim. I found later that the right flap was down a bit, which

caused the need for the trim. I corrected that on subsequent flights and removed nearly all of the trim.


What can I say? It flies like a Cub, but with more aerobatic qualities than an average Cub! The airplane tracks well, rolls

nicely, and turns without using coordinated rudder. In fact, it flies much like an aerobatic model! Rudder is positive, and knife-edge flight is quite easy. Loops are nice and round, and inverted flight only requires a touch of down-elevator.

I made several low-speed passes for pictures and videos, and the model is steady. Unfortunately, the engine quit at the bottom of a loop on the test flight, so I set up for an unscheduled landing. The aircraft was predictable and showed no bad habits as I landed a little farther away than I had planned.

Conclusion

In closing, this is a fantastic model! I have nothing but praise for Hangar 9 and Horizon Hobby's effort to bring this latest evolution of the Cub family to the RC market. It was fun to build, and it is a great-flying airplane. I have not always been a Cub fan, but this one has changed my mind!

I am looking forward to spring and the opportunity to make many more flights on the Horizon Hobby Hangar 9 CubCrafters X-Cub 60cc ARF. I suggest that you get yours right away and be the first one at the field with it! It will attract lots of attention! 



The aerodynamic design of the Flex Innovations Mamba 60E, with assistance from the Aura 8, locks into knife-edge flight with no tendencies to pull to the canopy or wheels.

AN EXCITINGLY CAPABLE BIPLANE

Flex Innovations Mamba 60E Night Super PNP

By Jay Smith | jays@modelaircraft.org

Photos by Matt Ruddick and the author

FLEX INNOVATIONS WAS FOUNDED in March 2014 by Quique Somenzini and David Ribbe. Since the company began nearly 6 years ago, Quique and David later brought on Joseph Burch and Seth Arnold, and released several impressive aircraft, some of which have been reviewed in *Model Aviation*.

The company's name came from wanting to be flexible and cover all aspects of the hobby. A goal that has proven to be popular with customers is to release finely tuned aircraft so that the model you receive is set up and flies exactly as the designer intended. Key to that is the Aura 8 Advanced Flight Control System that is compatible with major radio brands.

Flex recently began integrating a lighting system into several of its foam-composition models, which can be identified by the word "Night" in their names. The factory-installed, super bright, internal LEDs illuminate the airplane from the inside and can be remotely switched on and off from the transmitter. This is great for flying at dusk, dawn, or anytime in between and can even be seen during daylight hours.

Assembly

A large airplane requires a large box, and the parts inside were well protected. Each part was bagged, and every location where parts touched was protected by foam. All of the hardware was separately bagged, and all of the bags were labeled.

Before beginning the assembly, I visited the Flex Innovations website to check for any addendums to the manual. I found one that instructed me to check the channels that the ailerons were plugged into on the Aura. Also provided was an update regarding radio programming, and a correction was given for the size of the wing-mounting screws.

The aircraft arrived without any damage. The Mamba 60E, with four wing halves, required two tables to lay everything out.

To get the Mamba 60E flight ready requires basics tools, blue Loctite, and 5- and 15- minute epoxy. To allow adequate drying time, the model was assembled over the course of two days.

The process started with attaching the rudder and tail wheel. The way the rudder is attached is

REVIEW



The Mamba 60E comes out of the box with all parts bagged and the hardware individually labeled.

inventive because it basically snaps in place in front of the hinge line and the epoxy keeps it there. Five-minute epoxy is perfect for this and provides enough time to get the rudder properly mounted.

The wheels are preassembled on the axles and are bolted to the landing gear. Before installing the wheel pants, I checked to see that the wheels rolled freely and found one to be binding slightly. Tubing is used on the axle and it was a little too long on one side. Because the wheel was held on the axle using a C clip and I didn't want to risk losing it, I opted to trim the tubing slightly with an X-Acto knife. The wheel pants were then easily installed.

The transmitter setup was next in the manual. I opted to use a Spektrum AR8010T receiver because it uses an SRXL port that allows for direct connection with the Aura.

The male-to-male servo extension is even included with the aircraft. With this setup, only the ESC and connection with the Aura through the SRXL port are used on the receiver.

I encountered a minor challenge when it was time to connect the ESC to the receiver. The AR8010T has curved ports for servo connections such as what you find on Spektrum servos and servo extensions. This requires either rounding the bottom edges of the ESC plug or using a Spektrum or similar servo extension, which is what I opted for.

A magnetic hatch on the bottom of the aircraft provides access to the Aura Flight Control System and the receiver. A thoughtful feature is a trough in the foam on both sides of the fuselage above the plywood tray. This allows more space to neatly route servo wires and the receiver antennas.

After the horizontal stabilizer and elevator are installed, it's time to mount the servo horns and connect the provided linkages with ball links for a precise, slop-free connection.

Installing the top wing center section presents a choice of whether or not to permanently attach it using epoxy. Flex Innovations recommends that all ends of the cabane struts should be glued to the wing and fuselage with 15-minute epoxy in addition to the eight 2.5 x 8 Phillips head self-tapping screws being installed in every joint to the wings and the fuselage. If storage and/or transportation is an issue, only using screws in the bottom (fuselage) joints is an option to make the center section removable.

I chose to use epoxy for all eight cabane strut connections and I agree with the

manual that it is best to complete this in two steps to allow ample time to align things. I glued the cabane struts into the fuselage first, and then to the wing center section.

I used a thin piece of piano wire to confirm that each strut was seated properly by passing it through the hole in the mount and into the predrilled hole in the cabane strut. This was quicker and easier than using a flashlight to confirm that everything was properly aligned.

To give the epoxy the recommended time to fully cure, it took 3 hours for each of the two steps (6 hours in all), so I completed the remaining assembly the following day.

When it came to install the top left-wing half, some glue kept the wing from seating properly. Using an X-Acto knife, I removed the excess glue to achieve a perfect fit. After the top and bottom wings were attached, four interplane strut retaining pins were used to attach the two interplane struts.

Insert the retaining pin into the leading edge (LE) predrilled hole at the base and top of the "I" strut. Slide the pins in to the point where you feel them pop into place. Rotate the pins so that the exposed part is resting on the strut. This greatly simplifies attaching and removing the wings if it is required for transport and storage.

The manual states that the propeller, spinner, and baffle must be installed; however, on my model, the baffle was preinstalled. I'm glad Flex Innovations chose to not attach the propeller because it is much safer to work on the aircraft with it left off until assembly is complete.

The model has a large battery hatch on the top of the fuselage in front of the wing. This makes battery swaps simple. Because I opted for the Night version, the balance plug is plugged into the light controller for power. The balance plug is a 6S connector, but only 3S power is used, so if you are powering the lights with the flight battery, it is important to balance charge the battery each time you charge it.

I noticed that the main wiring for the lights ran under the battery tray, but it was between one of the battery straps and the battery tray. This meant that I would be tightly fastening the wires to the bottom of the tray on battery changes, so I took a moment to remove that battery strap and run the wiring underneath it.

Using a 6S 4,200 battery, I was able to achieve the proper center of gravity of between 2-11/32 and 2-5/8 inches (60 and 70 mm) behind the the bottom wing's LE. I used a piece of nonskid rubber cut to the size of the battery between the plywood battery tray and the battery to ensure the battery could not shift in flight. The battery was held in place by two of the three battery straps.

Flying

The Aura comes preconfigured with three flight modes. Mode 1 (Gyro Off): Gyro gain is set to 0 (off). All of the rates are set to low for general flight (same as Sport Mode). Exponential is tuned for comfortable flight.

Mode 2 (Sport): Gyro gains are moderate and tuned for comfortable feel/best performance for general flight. All of the rates are set to low for general flight. Exponential is tuned for comfortable flight.

Mode 3 (3D): Gyro gains are moderate and tuned for general flight. All of the rates are set to highest. Exponential is tuned for comfortable flight.

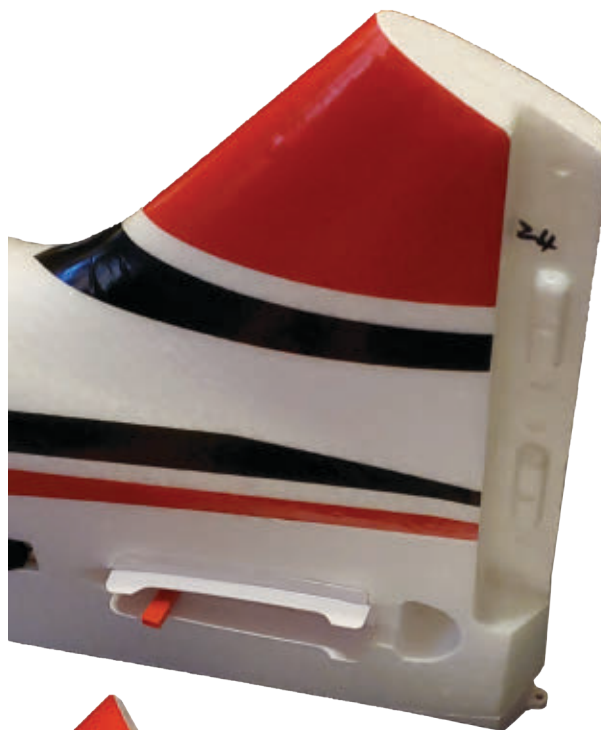
The initial flight was done in Mode 2 Sport with gyro on. The Mamba required a small amount of right aileron and two clicks of down-trim to fly hands off.

After the flight, you should adjust it to remove the trim inputs. The Aura 8 features a Quick Trim Mode that eliminates the need to make mechanical linkage adjustments; however, that is also an option if you prefer.

In Sport mode, when set up as instructed in the manual, the Mamba is quite comfortable to fly. This mode is perfect for sport flying or when performing precision-style aerobatics. Loops, rolls, Split S maneuvers, Cuban 8s, reverse Cuban 8s, stall turns, and Immelmans can all be easily performed and make the pilot look good while doing so, thanks to the Aura stabilization.

Knife-edge flight only requires the proper amount of rudder input. There is no tendency to pull to the canopy or wheels. This gave me the confidence to fly knife-edge maneuvers at a lower altitude that I normally reserve for aircraft that I have had a bit more flight time with.

The vertical uplines are good and the Mamba has plenty of power on tap to take the model to higher altitudes, but it is not unlimited. That noted, there is plenty of power to pull out of a hover and provide further separation from the ground for spins,



The rudder "snaps" together and is permanently attached with epoxy.



The Mamba comes with easy-to-install wheel pants that offer a reasonable amount of clearance for those wanting a more finished look.

REVIEW



At A Glance



Specifications

Model type: Foam aerobatic biplane
Skill level: Intermediate
Wingspan: 53.2 inches
Wing area: 1,181 square inches
Wing loading: 15.16 ounces per square foot
Length: 57 inches
Weight: 7 pounds, 12.3 ounces
Power system: Potenza 65 550 Kv motor (included); Hobbywing 80-amp ESC (included)
Radio: Six DS-34HV metal gear, digital, mini servos for all control surfaces (included)
Flight duration: 5-plus minutes
Price: \$569.99



Pluses

- Factory-programmed and installed Aura 8 Advanced Flight Control System.
- Factory-installed internal LED lighting.
- Two-piece top and bottom wings with metal interplane strut-retention pins for quick assembly.
- Ball link connections on all control surfaces.
- Large, easily accessible battery compartment.



Manufacturer/Distributor

Flex Innovations
(866) 310-3539
www.flexinnovations.com

rolling downlines, and parachutes.

Only light pressure on the elevator stick is required to maintain level, inverted flight.

When you are ready to get your 3D fix, a simple switch adjustment provides an inspiring, fine-tuned flight experience. I consider myself more of a sport and scale type of flier, but the Mamba 60E and its Aura stabilization provide a boost of confidence while never feeling intrusive.

This larger version, like its smaller sibling,

the Mamba 10, provides a low wing loading. It is comfortable being flown low and slow. Harriers can be performed with minimal wing rock and the ample rudder authority helps lock in a hover.

The full 3D capabilities of the Mamba 60E are beyond my skillset; however, both Quique and Seth have provided videos showing the aircraft's full potential on the product page.

When the battery signals that it's time for the fun to end, the Mamba practically lands itself in Sport Mode with no ballooning. A pilot just needs to line up for the landing and begin slowly reducing power while holding slight back pressure on the elevator until touchdown. This aircraft continually rewards me with great landings.


The Mamba is capable of being flown with 6S LiPo packs ranging from 3,700 mAh to 5,200 mAh; however, the Potenza 4,200 mAh battery really hits the sweet spot between weight and flight duration, providing 5- to 6-minute flight times.

Conclusion

Biplanes are my favorite type of aircraft and flying them sure puts a smile on my face. Assembly and disassembly are the only parts of the experience that can seem like a chore, but not with this biplane.

Although it's big enough to have a great presence in the air, the 53-inch Mamba 60E can be conceivably stored and transported with the wings on, depending on the size of one's vehicle. If you do have to remove the wings, the interplane strut retention pin system, combined with the single-screw retention of each wing half, makes assembly and disassembly a snap.

The Aura 8 and the Mamba are finely tuned, allowing this aircraft to satisfy the needs of sport, precision, and 3D pilots with confidence-inspiring flight characteristics to allow for further exploration of your flying goals. The lighting system is well implemented and would certainly benefit those who enjoy flying in lower light conditions.

Simply put, the Flex Innovations Mamba 60E Night Super PNP is the best-flying aerobatic biplane this author has ever flown! 

SOURCES:

Spektrum
(800) 338-4639
www.horizonhobby.com



A magnetic hatch on the bottom of the aircraft provides access to the Aura Flight Control System and the receiver. A trough in the foam on both sides of the fuselage above the plywood tray allows more space to neatly route servo wires and the receiver antennas.



The large battery compartment can easily accommodate 6S battery packs ranging from 3,700 mAh to 5,200 mAh; however, the Potenza 4,200 really hits the sweet spot between weight and flight duration, providing 5- to 6-minute flight times. The light controller balance plug can be seen on the side of the fuselage and is easier to plug in if the battery is turned upside down.



Tilting rear fans allow the FV-31 to take off vertically, and then transition to conventional forward flight.



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EXPLORE THE FRINGES OF RC FLIGHT

Flex Innovations FV-31 Cypher VTOL EDF Super PNP

By **Terry Dunn** | terrydunn74@gmail.com
 Photos by **Mark Gustas**

I'VE ALWAYS BEEN FASCINATED BY unique aircraft designs. Whether it's an airplane that merely looks strange or one that accomplishes flight in an unconventional manner, my interest is piqued. The new FV-31 Cypher from Flex Innovations hits on both points.

With a jetlike flying-wing planform, this model has a distinctive profile. It's not likely to be mistaken for anything else at the flying field.

The Cypher is powered by four electric ducted fans (EDFs). Two of those fans can be tilted in flight to push the model through maneuvers that will have onlookers watching slack-jawed in disbelief. This is my kind of aircraft!

No Runway? No Problem

The primary distinction of the FV-31 is that it is capable of Vertical Takeoff and Landing (VTOL).

The model can ascend from the ground vertically and hover in place, much like a helicopter or multicopter. With the flip of a switch, the Cypher will transition into conventional forward flight. You can also convert back to hovering flight for landings. I'll cover more details of this model's VTOL chops in a bit.

The FV-31 has a factory-built, molded-foam airframe that is painted in one of two color schemes. Mine is decked out in two-tone gray camouflage with U.S. Marine markings. The red, white, and blue U.S. Air Force option is slightly flashier.

Flex Innovations offers the FV-31 as a Super Plug-N-Play (PNP) package that provides everything you need except a three-cell LiPo battery (2,200 to 5,200 mAh, 40-plus C) and a receiver. This model requires an SBus type of receiver with at least six channels. The manual lists numerous

REVIEW



The Cypher is a factory-built foam model. Most of the necessary electronics are included.

physically connected to your computer with a USB cable or to your cellphone or tablet with the included Bluetooth adapter.

Those who do not have experience configuring a multirotor should not feel intimidated. The process is relatively straightforward for anyone with average computer literacy; however, if you still struggle with email and Facebook, the Cypher may not be the best model for you.

My Spektrum receiver fits nicely next to the flight controller. All of the factory-installed radio wiring is clean and neatly bundled. This makes for a very tidy and attractive radio bay. On the transmitter side, I used my Spektrum iX12 and programmed it according to the guide in the FV-31's manual.

Assembling the FV-31 begins with setting the rear fan units to the correct tilt angles. This is done by adjusting the length of the relevant pushrod and fine-tuning the servo endpoints on the transmitter. Plywood gauges are included to ensure that you set the angles correctly.

A foam shroud covers the tilt mechanism and servo. I noticed that the ball-link screw on the servo arm had gouged the inner surface of the shroud. To prevent future interference, I flipped the screw 180°.

The Cypher includes fixed tricycle landing gear. Plastic mounts for the main gear are embedded in the airplane's belly. The nose gear is attached to the built-in steering mechanism with setscrews. I thought that the included wheels did not spin very well on the 3 mm diameter axles. They worked much better after enlarging the holes with a 1/8-inch (3.2 mm) drill bit in a pin vise.

I fly the FV-31 with a Potenza 3S 3,500 mAh 75C LiPo battery. It is fastened to a tray in the radio bay with hook-and-loop tape. Two straps around the battery ensure that it doesn't shift in flight.

The Cypher's power leads come equipped with EC3 connectors. I thought that the stock routing of these leads through the left side of the battery tray made it difficult to connect the battery. I was able to reroute the wires to the right side by temporarily unbolting the battery tray from its mounts. A small section of webbing had to be cut away from the battery tray to allow the connector to fit through, but the relocated wires are now much easier to manage.



This flight controller (green circuit board) is the key to the FV-31's broad flight capabilities.

applicable receivers from several radio manufacturers. I used a tiny Spektrum SMP4649T receiver.

All of the brushless EDF units are factory installed and come with dedicated 40-amp ESCs. Three Potenza DS-15 digital servos are in place to handle the elevon control surfaces and nose wheel steering. A standard-size So090 servo with metal gears actuates the beefy mechanism for tilting the rear fan units.

A printed assembly manual is included, but many of the photos are too dark to be helpful. I found the electronic version of the manual much easier to see clearly. It is available on Flex Innovations' website. The website also has a Wiki page with loads of tips and hints for setting up the Cypher. It's worth looking at

before you begin assembly.

Building the FV-31

There are two distinct aspects of preparing the Cypher for flight: assembling the airframe and configuring the electronics. The manual begins with the electronic side of things. This is somewhat more involved than configuring a typical fixed-wing model because the FV-31 uses an onboard flight controller. The flight controller is basically a small circuit board with gyros that stabilize the aircraft in all phases of flight.

Some radio setups, or enabling telemetry features, may require you to reprogram the flight controller. This is accomplished with free interface software called Betaflight. The flight controller can be



Plywood gauges are provided to ensure that you set the tilting rear fans at the proper angle.

Profiles, Configurations, and Switches

It is important to recognize that the FV-31 is ultimately flown by the onboard flight controller. Your control inputs go to this circuit board, which analyzes the model's current state, and translates your commands into control surface movements and/or throttle adjustments of each fan. There is no way to bypass or disable the flight controller. You might have the stick-and-rudder sensibilities of Bob Hoover, but those flying skills will be useless unless you also understand how to manage the flight controller.

The manual does a good job of explaining things. Make sure you take the time to become familiar with the two flight profiles (Beginner and Advanced), how they work, and how to switch between them. There is no shame in using the beginner mode as you familiarize yourself with the Cypher's unique flying abilities.

The flight controller also provides three flight configurations. These configurations reflect the three possible tilt positions of the rear fans and are selected via a three-position switch on the transmitter. In the Hover configuration, the rear fans provide only vertical thrust. They work with the front fans (which are fixed to always provide vertical thrust) to essentially make the Cypher a quadrotor. The wings and elevons are merely ornamental here. Pitch, roll, yaw, lift, and translational speed are all governed by the four fan units working in unison.

If you've never flown a quadrotor, I suggest investing some time with an RC flight simulator or an inexpensive mini quadcopter (the Blade Inductrix is a good choice) before flying the FV-31. Multirotors are not difficult to fly, but they typically require a little training to develop a feel for the controls.

Conventional configuration twists the rear fans to provide purely forward, horizontal thrust. In this state, the Cypher is controlled much like a common fixed-wing model. It will perform rolling takeoffs and landings. It flies through the sky using lift from the wings.

In the Magic configuration, the rear fans are tilted downward at 45° to provide equal amounts of lift and forward thrust. This gives the FV-31 flying abilities that are not quite like a multirotor or a fixed-wing airplane. It is something in between—and very cool.

Flying the FV-31

In my initial hops with the Cypher, I used the Hover configuration. I found it easy to take off and land vertically in both Beginner and Advanced modes. I even spent some time tooling around the field at walking speed. Those of you with some stick time on multirotors will not have any trouble, but again, I do not suggest the Cypher for your first multirotor experience.

The next step for me was to get a feel for the Cypher in the Conventional



At A Glance



Specifications

Type: Electric VTOL sport flyer

Wingspan: 38.2 inches

Length: 35 inches

Radio: Spektrum iX12 transmitter; Spektrum SMP4649T receiver; three Potenza DS-15 digital servos (included); one S0090 metal gear standard servo (included)

Components needed to complete:

Minimum six-channel DSM2/DSMX transmitter; SBus-capable receiver; three-cell, 2,200 mAh to 5,200 mAh 45-plus C LiPo battery; charger

Minimal flying area: Club field

Price: \$399.99

Power system: Four brushless ducted fans (included); four 40-amp ESCs (included); Potenza 3S 3,500 mAh 75C LiPo battery

Flying weight: 60.2 ounces

Flight time: 3 to 5 minutes



Pluses

- Unique design.
- Broad flight capabilities.



Minus

- Poor photos in printed manual.



Manufacturer/distributor

Flex Innovations

(866) 310-3539

www.flexinnovations.com

configuration. It requires a long takeoff roll on my club's grass runway, but it performs well.

Loops and rolls (Advanced mode only) are easy and fun. It flies with the ease of a four-channel sport flyer. My only disappointment is that the top speed is not as fast as I had hoped.

Next up was the Magic configuration. I

REVIEW

expected a short ground roll, but the Cypher took to the air right away. The model naturally assumes a moderate forward speed. I found that I could keep the FV-31 hovering in place with back pressure on the stick. It will even fly backward!

Experimenting with forward flight revealed why this is called the Magic configuration. The FV-31 is capable of many maneuvers that are typically associated with a fixed-wing airplane. It just does them at unbelievably slow speeds. I particularly like doing back-flip-style loops.

The best way to experience the full breadth of the Cypher's flight envelope is to transition between flight configurations on the fly. It takes a couple of seconds for the tilt mechanism to sweep from one setting to the next. This helps make configuration changeovers seamless. Going from any configuration to another can be a hands-off affair. Just make sure that you have adequate throttle input, flip the switch, and let the flight controller keep the FV-31 flying while the fans tilt.

Onlookers will be amazed when you perform a vertical takeoff in the Hover configuration. Then flip the switch for a full-throttle inverted pass in Conventional configuration. Be sure to include a tortoise-speed touch-and-go in Magic configuration. There are infinite possibilities!

With most of the models that I review, I feel as though I have a good grasp of their flying abilities within the first few flights.


This is not so with the FV-31. There are so many options that I still feel as though I'm scratching the surface. I'll be getting to know this airplane for a long time.

Deciphering the Cypher

The FV-31's versatility does not come without a cost. Using a 3,500 mAh LiPo battery, my flights typically last somewhere between 3 and 4 minutes. I might be able to achieve more duration and I am cautiously extending my flight times in baby steps.

Another thing to consider is that the Cypher is an inherently complex model. This airplane has more bits and pieces to manage than most. For instance, trimming the airplane for level forward flight involves more than just the center of gravity and control surfaces. The rear fan angles and flight controller calibration must also be considered.

The FV-31 rewards those who are willing to manage its mechanical and electronic gadgetry. This model looks and performs like nothing I've ever

flown. Whether you consider it an airplane with multirotor roots, a quadcopter with wings, or something else entirely, the distinction seems unimportant. The Cypher is a model for those of us who like to explore the fringes of RC flight. 

SOURCES:

Spektrum

(800) 338-4639

www.spektrumrc.com

Betaflight

<https://betaflight.com>



This Potenza 3S 3,500 mAh LiPo battery provides flight times of 3 to 4 minutes. Note the battery straps and repositioned power leads.



With the rear fans tilted 45°, the Cypher is capable of otherworldly flight maneuvers.



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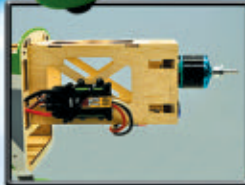
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The water rudders made water operations easy, and the model handles the extra drag of the floats without issue.



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FLY FROM FLOATS OR WHEELS RIGHT OUT OF THE BOX

Horizon Hobby E-flite Turbo Timber 1.5m BNF Basic with AS3X and SAFE Select

By Greg Gimlick | maelectrics@gimlick.com
Photos by the author

I WAS FORTUNATE to have reviewed the original Timber when it first came out and I wore the airplane out because I flew it so much! With that experience, I had high expectations for the new E-flite Turbo Timber and jumped at getting one.

As I unpacked it, I wasn't disappointed. The finish on the EPO foam was exceptional, and the new turbo engine exhaust in the cowling added to its cool look. It was packed in E-flite's typical well-designed foam shipping box, so nothing was damaged. Look closely at all sides of the foam box because there are some hardware bags taped in recesses that could be easily missed.

It was obvious that the company had upgraded the fixed-gear mounting brackets with the new version, but I was excited to see that it stayed with the simple rudder design on the floats.

Assembly

Begin by thoroughly reading the manual then check online to see if there have been any corrections or addendums. There weren't any, and the only errors in the manual that I found were the airplane's dimensions. No biggie. The control throws and center of gravity (CG) were correct.

E-flite makes radio programming as simple as possible. Even if you get the receiver-ready version, the programming chart offers enough information to make programming a different radio easy. I used my Spektrum iX12 and copied the settings from the manual.

The spring-loaded landing gear is the first assembly step and it flexes at the base on hinged assemblies. With big tires and live gear, the aircraft is custom-made for STOL operations.

REVIEW



The parts count is low and assembly is quick.

The tail surfaces slide on with a joiner and interlocking plastic piece and are then secured with two screws. Everything aligned perfectly, and it was simply a matter of connecting the control rods with 90° bends employing keepers.

The wing assembled much the same way using a joiner and a plastic plate at the rear to hold it all together when bolted down. Tabs in the leading edge (LE) fit receptacles in the fuselage for a secure mount. The biggest chore was trying to neatly pack all of the wires from the servos and lights into the fuselage and avoid contact with antennas and tail servos.

Slats or Not?

The included LE slats are optional. After deciding to install them, you'll have to live with them because there is no provision to make them removable. I bought this aircraft for its Short Takeoff & Landing (STOL) capabilities, and having used the slats on my original Timber, I knew I'd use them on the Turbo version. Be sure to pay attention to the marking on each one for left- and right-wing panels.

The roll rate will be slightly reduced, but the inverted capabilities will suffer

most. You can do outside maneuvers and inverted flight, but you'll have to be more aggressive with the elevator and be patient. Installing the slats allows slower-speed flight and increases aileron authority at those speeds. You can also carry a higher angle of attack before it stalls. It's definitely worth installing them.

Floats

If you haven't flown off of water, you're in for a real treat. A huge plus is how easy the floats are to install and remove. A few screws, a couple of pull-pull connectors, and you're done!

Unlike some models, this one can leave the field and head to the lake in minutes.

Control Throws and CG

I set the CG at the recommended 60 mm and adjusted the battery's position to achieve that. Be sure to measure the distance from the wing's LE and not the front of the LE slats. The floats shifted the CG slightly aft.

My control throws were set at the recommended settings and I've left them there. No exponential was programmed as instructed by the AS3X system manual.

SAFE Select or AS3X Only

I love AS3X. The Turbo Timber also offers SAFE Select, a self-leveling system that allows a pilot to center the sticks and the receiver will level the airplane. This is a great option for beginners.

The real beauty of the Turbo Timber's system is that it allows you to bind it so that SAFE Select is active, then assign a



The floats attach to the fuselage by fitting into slots and are retained with screws and plates.



At A Glance



Specifications

Model type: Foam electric aircraft

Skill level: Beginner to expert

Wingspan: 47.5 inches

Wing area: 559.5 square inches

Airfoil: Semisymmetrical

Length: 40.9 inches

Weight: 57 to 60 ounces

Wing loading: 13.45 ounces per square foot

Power system: E-flite BL10 800 Kv motor

(included); E-flite 50-amp brushless ESC (included);

E-flite three-blade 11 x 7.5 propeller (included);

E-flite 2,200 mAh 3S 30C LiPo; E-flite 2,200 mAh 4S

30C Smart LiPo battery

Radio: Spektrum AR636 receiver (included);

Spektrum 9-gram metal gear servos (included)

Construction: EPO foam

Price: \$269.99

Requires: Full-range, six-channel DSMX/DSM2

transmitter; 2,200 mAh 3S or 4S LiPo flight battery;

compatible LiPo charger

Test-Model Details

Radio system: Spektrum iX12 DSMX transmitter

Ready-to-fly weight: 57.9 ounces (3S); 58.8 ounces (4S)

Wing loading: 14.9 ounces per square foot (3S); 15.1

ounces per square foot (4S)

Flight duration: 5 to 8 minutes



Pluses

- STOL and aerobatic flight capabilities.
- 3S- and 4S-compatible power system.
- Stiffer wing than the original Timber.
- Very effective flaps.
- Metal-gear servos.
- AS3X and SAFE Select enabled.
- Shock-absorbing gear with oversize tundra tires.
- Includes floats.
- LED landing, navigation, and strobe lights.



Minus

- Receiver antenna not secured away from the bundle of servo wires.

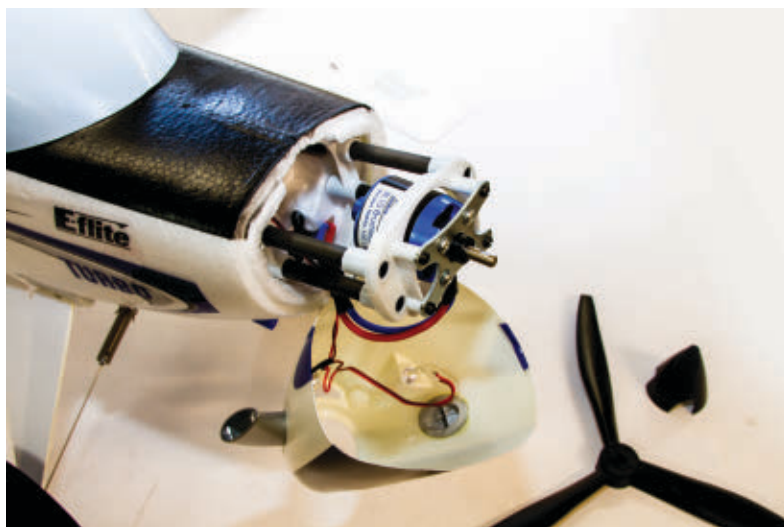


Manufacturer/Distributor

Horizon Hobby/E-flite

(800) 338-4639

www.e-flite.com



The business end shows the motor and wiring for the lights. It's not necessary to remove the cowl during assembly, unless you want to double-check security of the bolts.



A 3S or 4S battery fits easily into the belly compartment and is secured with Velcro and straps.

switch to turn it on or off. If you don't want to use SAFE Select, simply bind it in the usual fashion and you'll have AS3X only.

A word of caution: Be sure to check that your chosen switch for turning SAFE Select off or on is active in the radio's programming. If you don't get the elevator signaling that the switch changed positions, it probably isn't active in the transmitter. When the model is powered up, it defaults to having SAFE Select on.

REVIEW

The flaps on the Turbo Timber are effective, and the model slows nicely. It excels at STOL flying, especially when the slats are used.



Flying

I couldn't wait to take the Turbo Timber to the field then to the lake. The STOL capability of this airplane is just incredible! I loved the way the original did STOL operations, and the new version takes it up a notch—especially when I used the 4S setup.

I did the test flight with SAFE Select active to see how well it worked and it was every bit as effective as it was on the original. Next, I flipped the switch to disable SAFE and it was as though an old friend had returned but with more power. The AS3X works in the background so it doesn't ever feel as though you're fighting a stabilizer. It dampens out some of the turbulence, but not enough to reduce the feel of the airplane.

Slowing down for a landing with full flaps is a thing of beauty! Takeoffs are equally quick using flaps. With flaps deployed and a blip of throttle, the Turbo Timber is headed skyward in an instant. In fact, you better be ready because it's

going to go straight up!

The more I experimented with stalls and slow flight, the more impressed I became. I'm not sure I can even call them stalls because they just sort of mush along and never drop a wing.

With the LE flaps installed, full-on aerobatics become more challenging. The elevator feels "heavy" during inverted flight and outside loops require much more altitude, but the capability is there.


Doing aerobatics with this airplane is different, but it was designed for STOL. With that noted, it will hover with a 4S battery and do respectable loops and rolls using wheels or floats.

Flying off of water is a breeze. This airplane is as good as it gets if you're looking for a first floatplane to learn water operations. Using SAFE Select, beginners could easily teach themselves float-flying knowing that the airplane will compensate for some mistakes when rising from the water. The pull-pull water rudders work like champs and are practically the easiest I've seen to set up. This

model is a joy to do touch-and-gos off of water!

Conclusion

I bought the Horizon Hobby E-flite Turbo Timber because I wanted a STOL aircraft and it filled the bill perfectly. I guess I knew it would because I loved my original version. The fun of this airplane is seeing how quickly I can get it off of the ground and how little rollout I get upon landing.

It's aerobatic when wanted and a beginner's trainer when needed. The ability to switch back and forth between the 3S and 4S power setups without making any other changes is nice! The three-blade propeller looks great and pulls the model through the air with authority. 

SOURCES:

Spektrum
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AN ENJOYABLE MODEL TO BUILD AND FLY

Moustache Model Works 20cc DHC-2 Beaver

By Fitz Walker | flying_fitz@yahoo.com

Photos by Lee Ray and the author

THE DE HAVILLAND DHC-2 BEAVER is one of those classic aircraft that is beloved and instantly recognizable among aircraft aficionados. First flown in 1947, it was designed to meet the needs of a Short Takeoff & Landing (STOL) utility aircraft and it continues to see wide use worldwide. Acclaimed actor Harrison Ford owns one. It proves that radial engine aircraft can still be practical to use in the modern era.

The humorously named Moustache Model Works company's first kit, the Beaver, is a 91-inch wingspan, balsa and plywood, laser-cut scale kit. It is designed for 20cc gas engines or equivalent electric power. (E-flite Power 60 motor and 6S 5,000 mAh battery are recommended.) I chose to use a RCGF 20cc rear-exhaust gas engine for my build.

Construction

Even before opening the box, I was impressed. Its heft was substantial. Normally that might mean

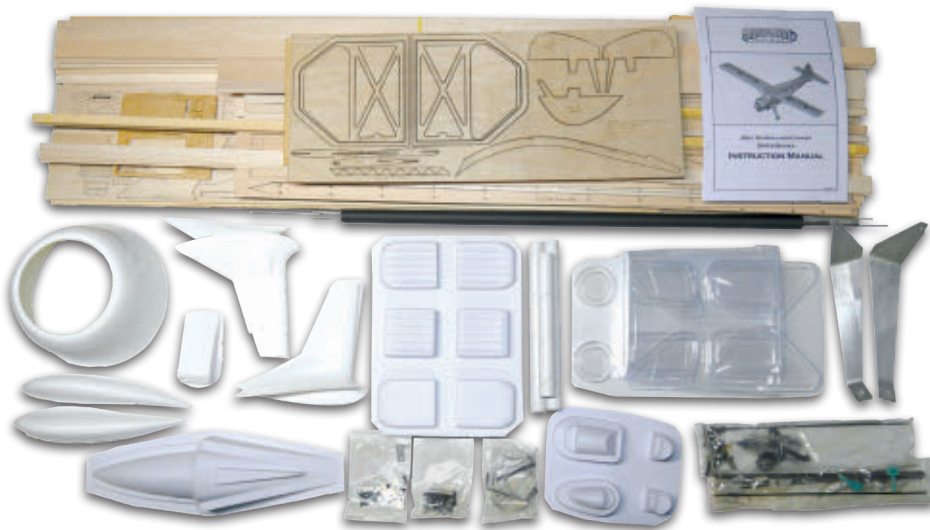
an overweight model, but when you open the box, it's obvious that there is an impressive number of parts included.

I counted 28 sheets of laser-cut wood in addition to 34 pieces of stock wood. Add numerous bags of hardware, as well as vacuum-formed and fiberglass parts, and you end up with a complete kit. Three rolls of plans that are nearly large enough to wallpaper a small room are clearly printed.

The manual is 38 pages of step-by-step instructions, with accompanying black and white photos and a detailed parts list. A downloadable PDF file features high-resolution, color photos. This came in quite handy because I was able to zoom in on construction pictures, which helped to clarify some of the steps. Both US customary and metric units of measurements are referenced for convenience, although the hardware appears to be metric.

The quality of the laser cutting is superb. Even plywood and thick balsa parts can be easily

REVIEW



The kit includes hardware, many prefabricated parts, and excellent-quality laser-cut wood.

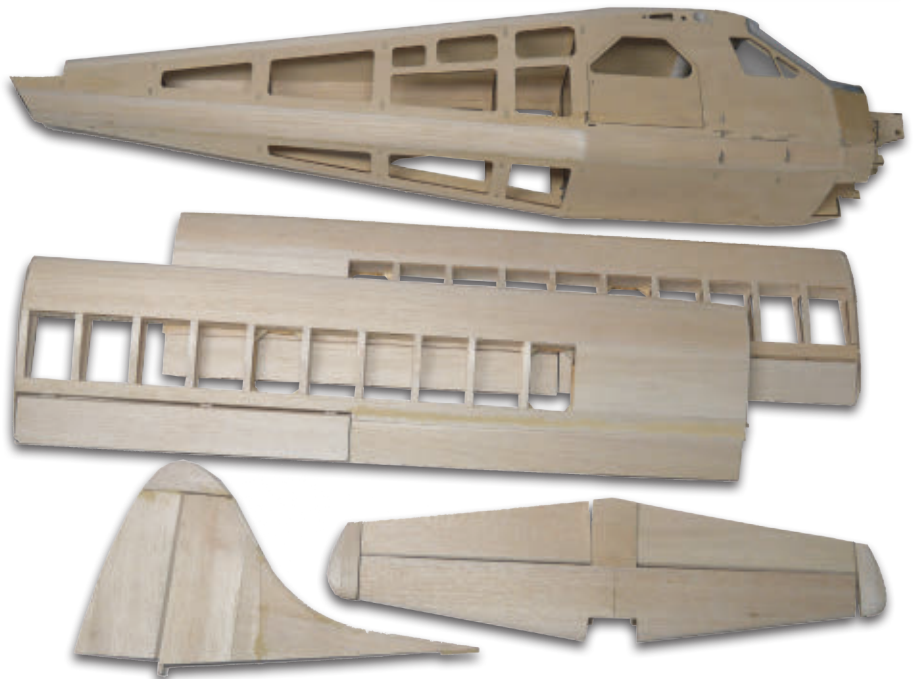
removed from the wood sheets. All of the parts were either engraved with part labels or had labels adjacent if no room was available on the part. The wood selection was also very good.

Construction starts with the tail surfaces, and the kit provides a nice introduction to building techniques that will be used throughout the build. I was nearly able to complete the tail without needing to place the parts on the plans. The self-aligning, interlocking structure fits together well. The built-up tail surfaces are fully sheeted, and some of the sheeting is even laser cut for convenience.

Wing construction is not difficult, but it does have some nuances that might not be immediately obvious. Several steps need to be read in full before gluing because there is some test-fitting involved. Be sure to pay special attention to the details in the written instructions. Several times I nearly made a mistake—and a couple of times I did—because I did not read the steps carefully. A couple of steps could have been more descriptive, but anyone with some kit building experience should not have problems working things out.

Plans are needed for wing construction, but I noted no significant alignment issues. After I started on the wing, I really began to notice the extent of the engineering that went into the kit. Nearly every part was laser-cut, including many minor parts that normally would be fabricated out of scrap balsa. The only items I needed to make were the custom-fitted rib capstrips.

I had an issue with the inner wing tube



The core parts are ready to be covered.

circular caps. They were cut too small, so I made my own using scrap wood parts. I used a mixture of Hitec HS-5496MH and HS-430BH high-voltage, standard-size servos. The kit provides wing servo-mount parts for both standard and mini servos.

The ailerons and flaps are built-up structures, as was the tail. The flaps are offset and hinged with hidden clevises. Quite a bit of carving and sanding was needed for the leading edges of the flaps and ailerons, but a micro plane and sanding bar quickly get the job done.

The wing struts were custom fabricated

from the included streamlined hardwood parts, which was a simple task with the help of a Dremel and cutoff wheel. Be sure to use threadlocker on the clevis threads and use fuel tubing to prevent them from coming loose during flight.

Constructing the fuselage is probably the most involved and time-consuming, although it is not difficult. It is also built without needing to be placed on the plans—just hang the plans on a wall for easy reference. Four large sheets of laser-cut light plywood make up the basic box structure, with balsa stock sanded and shaped to round the corners. The bottom of the fuselage uses precurved balsa sheeting. One of the curved balsa sheets was slightly harder than the other, so I used some window

cleaner to help bend the wood.

Most of the parts up to this point were glued using medium or medium-thick CA from Starbond Adhesives. The exception was the motor mount area where I elected to use 30-minute epoxy for extra strength.

The fuselage top has an optional lightening hole outline that is engraved but not cut all the way through. Leave it solid for better scale-like looks or cut it out to save a small amount of weight. I left it in.

At the front end, various motor/engine mounting options are included. Because I chose gas instead of electric power, I was

partially able to use the precut holes for DLE engines. Although the RCGF hole spacing is the same, the width of the crankcase is not. I needed to use one of the included blank rails and drill the remaining two holes.

There are provisions on the fuselage for mounting floats. This appears to be a future option being developed by the manufacturer.

The cowling is fabricated from gel-coated fiberglass with embedded panel lines. It is attached to the fuselage using blind nuts. I found the surface finish good, and the quality is quite durable.

Servos are mounted to the floor of the fuselage with provisions for rudder, elevator, and throttle servos. Because I wanted to be fancy, I cut an additional hole to mount the engine choke servo. I also elected to scratch-build a small platform for the fuel tank to fit over the engine servos.

Probably the most difficult parts are the gear strut fairings. These fiberglass parts form a clamshell enclosure around the aluminum landing gear and greatly add to the scalelike look of the model. Balsa ribs are glued onto the gear struts and must be carefully sanded and finely shaped to fit the inner fairing profile.

It took some patience and lots of test-fitting before I was ready to glue them on. Although I was generally happy with the final look, I was never completely satisfied with the fitting. I used 4.5-inch Du-Bro inflatable wheels for extra ground clearance and that “bush plane” look.

Except for the ailerons, all of the other control surface controls are hidden from view and use clevises and L-bend control rods. I found the included 3 mm control rods slightly difficult to bend sharply, so I elected to use smaller-diameter 4-40 rods instead for the tail surface controls.

I was very happy with the doors. Both sides have working doors that use included magnets to stay closed. The extra work to fabricate the doors is well worth it. They add not only scalelike looks, but also offer extra access to the interior and servos.

Of course, big doors mean it is also easy to see the interior. To address that, the kit also included a set of four seats. Constructed with a combination of vacuum-formed plastic chairs and a balsa base structure, the two rows of seats also cleverly disguise some of the servos and have space

underneath for the receiver and battery pack. More magnets hold everything in place. The interior was painted using gray latex house paint.

Installing the vacuum-formed windows completes the construction. These are clear and fit the precut outlines in the fuselage like a glove. Generous amounts of canopy glue hold the windows in place.

I used red and white Hangar 9 UltraCote iron-on covering to cover the model. Instead of covering the plastic wingtips, I used matching red paint. The livery detail is based on Alaskan Civil Air Patrol Beavers and uses a combination of trim sheets, paint, and custom vinyl decals.

The manufacturer estimates that it should take roughly 150 hours to build the kit, which is approximately as much time as it took me. I should also note that the model required 9 ounces of lead weight plus a 5-ounce propeller hub for balance.

After running out of excuses, it was time to fire up the RCGF engine to break it in a little before flight. The carburetors in these engines are typically dry and have trouble being primed when new, so I enlisted my electric starter to “get the juices flowing.”

After it was primed, the engine fired right up into a consistent, high-idle growl. Within a couple of tanks of fuel, I was able to adjust the settings for a strong, if slightly rich, full throttle and steady idle powering a 16 x 6 two-blade Master Airscrew propeller.

Flying

The weather gods were smiling on me! On the day of the maiden flight, it was a cool 70° with light wind mostly down the runway. Taxi tests found the pull-pull tail wheel setup working well with good steering control and turning radius.

The first flight ended with the engine richening up shortly after takeoff, but that wasn't an issue. I quickly noticed that the Beaver didn't need much airspeed to become or remain airborne. Despite the slightly balky engine, the model tracked true and felt stable in all axes.

On the second flight, I replaced the 16 x 6 two-blade propeller with a Master Airscrew 15 x 7 three-blade propeller. Full-scale Beavers are often seen with three-blade propellers and I like the look.

After a quick changeover and a tweak to the lean engine mixture, it was time to wring out the big Beaver more aggressively. With



At A Glance



Specifications

Model type: Semiscale electric/gas

Skill level: Intermediate

Wingspan: 91.4 inches

Wing area: 904 square inches

Length: 57.6 inches

Wing loading: 30 to 33 ounces per square foot

Flying weight: 12 to 13 pounds; ready to fly, 12.8 pounds

Engine: RCGF 20cc rear exhaust

Propeller: Master Airscrew 16 x 6 (two blade) and 15 x 7 (three blade)

Battery: 2S 3,800 mAh LiPo

Airfoil: NACA 4415

Construction: Balsa/plywood

Servos: Hitec HS-5496MH and HS-430BH high voltage

Radio: Hitec Aurora 9x; Hitec Optima 9 receiver

Price: \$329.99



Pluses

- Extremely well-designed kit.
- Generous amount of hardware included.
- Easy flying characteristics.



Minus

- Manual could use some minor clarifications.



Manufacturer/Distributor

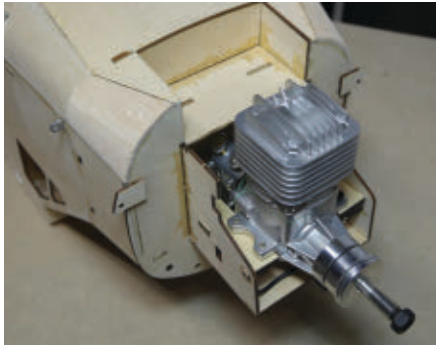
Mustache Model Works

www.moustachemodelworks.com

partial flaps and a better-running engine, the aircraft was up in roughly a dozen feet and climbing briskly. Performance with the three-blade propeller was more than adequate and I'm unlikely to change it.

Aerobatics match the type of aircraft. Loops and rolls were easy, although rolling to the left was noticeably faster than to the right. Snaps, spins, and stall turns were quite majestic. Stalls—with or without

REVIEW




The engine mount is designed to accommodate both side- and rear-exhaust gas engines.

flaps—were straightforward with no tip-stalling tendencies. The Beaver also likes a bit of rudder in the turns, which is duly noted in the manual. Inverted flying is okay, but I could tell the aircraft was happier in the upright position.

Landing is a nonevent, although it needs a little bit of throttle on final. I suspect the flaps and radial cowling act as effective air brakes. At full flap deflection, the model slows to a virtual crawl that would rival any trainer. In general, the Beaver is easy and relaxing to fly.

Conclusion

Although it's not a beginner's kit, the Moustache Model Works DHC-2 Beaver is an enjoyable build for those who have a couple of kits under their belts. It would make a great first scale build.

The kit design is thoughtful, and the aircraft's flying qualities are wonderful. The DHC-2 Beaver offers near-competition scale-like looks at a great price. 

SOURCES:

Hitec RCD

(858) 748-6948
www.hitecrcd.com

Starbond Adhesives

(213) 382-7788
www.starbond.com

Master Airscrew

(916) 631-8385
www.masterairscrew.com

RCGF

(818) 930-2055
www.rcgfusa.com

Du-Bro

(800) 848-9411
www.dubro.com

Hangar 9

(800) 338-4639
www.horizonhobby.com



The Hitec elevator and rudder servos are cleverly hidden under removable seats.



The large working doors and removable front hatch provide easy access to the interior.

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Robinhood 25

Ken Lawrence (El Cajon, California; email: mkaway@cox.net) modified his Old School Model Works Robinhood 25 to look more like a Curtiss Robin.

Major changes included trading the full-span ailerons for outboard ones, modifying the landing gear and wing struts, and adding a cowling to the motor to more closely resemble the full-scale OX-5-powered Robin.

The 3-pound Robinhood uses a 10 x 6-inch propeller, Hitec Energy Sport 40-amp ESC, Venom 2,200 mAh 3S LiPo battery, Tactic TR625 receiver, and four Hitec HS-82MG servos. The Solartex covering is painted with Rust-Oleum orange and antique white, and the graphics are by Callie Graphics.



125% Astro Hog

Marty Elder's (Birmingham, Alabama; email: martyeld@gmail.com) project began with a Sig Astro Hog kit. He enjoyed the building process so much that he cut the original Sig Manufacturing plans into 8 x 6-inch sheets, printed them to 125%, taped the enlarged sheets back together, and scratch-built a 125% Astro Hog.

Both aircraft sport maroon covering with cream accents and use Hitec servos with JR electronics. The smaller Hog is powered by an MDS .58 engine, while the 86-inch wingspan version is powered by a SuperTigre G-90 engine.

"The only challenge was laying out and cutting the cream accent trim to scale," Marty wrote, "but all in all, it was a labor of love and I enjoyed the hours spent at the workbench."



Sig 8-Star 88

Steve Hegedus (Reedsburg, Wisconsin; steveandj@charter.net) took two Sig Manufacturing 4-Star 64 ARFs and joined them at the wings and tails. He calls it the Sig 8-Star 88.

Twenty inches were cut off of each inboard wing, which were joined to form the center section of a three-piece wing, leaving the horizontal stabilizers approximately 1 inch apart to be joined by a removable balsa and plywood piece, with space between the noses for the propeller.

The outboard wing ailerons were split to form flaps and ailerons, and the center wing section has an additional large flap that was created by gluing the ailerons together. Both sets of main landing gear were kept, reducing stress during landing.

The maiden flight took place May 13, 2019. "It's unique and it flew well but required over 3/4 throttle for most of the three 5-minute test flights. I plan to switch up to 6S LiPos for the next flight," Steve stated.



Ben Buckle Double Diamond

The 1937 Ben Buckle Double Diamond is from Free Flight plans that Lee Wick (Ann Arbor, Michigan; email: wick1976@aol.com) converted from gas to electric power, with three channels for RC.

The balsa airplane is covered in transparent film with white accents. "I thought covering the undercambered wing would pose problems, but it was not as hard as I expected," Lee shared.

The 800 Kv motor and 1,300 3S LiPo battery were placed forward to compensate for the weight of the original gas engine.

"This is not an aerobatic plane, but [it] is very graceful. Takeoff is easy, even on grass. Landing into the wind is almost harrier-like. [It] is a crowd pleaser; the guys joke that they [can] hear and see the prop spinning slowly as she [flies] by."



Super Sportster Fleet

This fleet of Super Sportsters was built and is flown by John S. Baird (Sacramento, California; email: jsbaird_24@yahoo.com) and his son, John M. Baird. Both are members of the Mather Aerospace Modelers club in Sacramento and fly at Mather Regional Park (formerly Mather Air Force Base).

The Super Sportster has been a family favorite since the earliest stages of the family's hobby involvement. The aircraft are both kit- and scratch-built.

Shown are (front; L-R): Super Sportster 40 biplane kit, Super Sportster 40 kit; (middle; L-R): Super Sportster 60 kit, Super Sportster "Ultimate 80" scratch-built with Ultimate spinner, Super Sportster 90/120 scratch-built with a DLE-30 engine; and (back, L-R): Super Sportster 90/120 kit, and Super Sportster 90/120 scratch-built with a Saito 150 engine.



Snoopy

Larry Denning (Liberty, Missouri) has scratch-built model aircraft for 65 years. As he neared completion of the pictured aircraft, the search for an onboard pilot began, resulting in Snoopy.

The balsa-and-light-plywood model was purchased from a local hobby outlet. Red and white MonoKote was used for covering, while Snoopy sits under a Sig Manufacturing canopy. The motor, ESC, battery, and other electrical components are from an E-flite Apprentice. Larry bent some gear legs, added Du-Bro wheels, "and Snoopy was ready to fly."

The aircraft features full-span flaperons and aerodynamically balanced tail surfaces. "When he gets sufficient airspeed, Snoopy can perform just about any maneuver in the book, except hovering," Larry noted. "Flat spins are Snoopy's favorite."



Coroplast Edge 541

Andrew S. Rosz (Hollywood, Florida; email: arosz@att.net) has designed, engineered, and scratch-built original model aircraft designs from Coroplast plastic corrugated sheet material for more than 30 years. His latest masterpiece, a mid-wing Edge 541 sport flier, was completed in spring 2019.

The project took Andrew approximately 150 hours to complete, presenting him with many obstacles and challenges. "The designing, engineering, and building all had to be done concurrently and on the fly," he noted. "Success prevailed and the results are nothing short of spectacular."

The 40-size, 55-inch wingspan aircraft weighs 5 pounds. It's powered by an O.S. .46AX engine and controlled by a four-channel Futaba radio. The wing and fuselage are made from 2 mm Coroplast, with 4 mm and 6 mm material used for structural support.

Andrew wrote that it flies magnificently. His fellow fliers have expressed a desire to get one for themselves. "This project was truly a labor of love," he stated.



VM1W

Justin Anger's (Taylor, Michigan; email: toyplaneboy@gmail.com) VM1W was built from October 1972 Paul Strenge plans and is powered by an Enya .19. Schemed in full-scale Grasshopper colors, the 40-inch model weighs 2.4 pounds.

The VM1W was designed with a bigger radio compartment to fit three Kraft servos. Justin instead used four Hitec HS-81 servos and a 40-gram battery pack for it to be as lightweight as possible. He wrote that it cruises around great at less than 10 mph.

OLD-TIMERS

Bob Galler launches his spark-ignition Spirit of SAM entry. The event calls for original rubber-powered models to be powered by small electric motors. Photo by John Eaton.



READER FEEDBACK

By Bob Angel | samrcflier@verizon.net

SOCIETY OF ANTIQUE MODELERS (SAM) competition rules specify lubricants (any), plus either gasoline or alcohol (FAI) fuel, for spark-ignition engines (no nitro compounds). In my October 2019 column, I mentioned FAI fuel as being composed of methanol, zero nitromethane, and a modern lubricant. Some of us often loosely refer to FAI fuel as being composed of either 20% or 25% castor oil or synthetic/castor mixes. The remaining ingredient is methanol, which is always mixed by volume.

A reader suggested that FAI fuel was, to the best of his knowledge, methanol plus castor oil only. In the interest of greater accuracy, I consulted the FAI rules.

First, a comment about FAI rules in general. I've sometimes stated that SAM might have the most complicated of all model competition rules. I take that back. FAI has SAM beat by a mile when it comes to details. This isn't a criticism—just an observation—because you obviously need specifics for serious international competition.

As I read it, FAI fuel is furnished as either “standard” or “nonstandard.” The only event for which I found a standard mix was Control Line (CL) Speed, where it's prescribed as 20% pure castor oil plus 80% methanol for either glow or spark-ignition use.

Nonstandard FAI mixes can be practically any combination of methanol, castor oil, nitromethane, synthetic oil, ether, kerosene-type Jet-A1, or unleaded gasoline. The only specific, nonstandard mix I found was for FAI CL Combat at 80% methanol, 5% nitromethane, and 15% oil.

We can apparently continue to loosely consider methanol and any oil to

be FAI when our primary intent is to exclude nitromethane. The SAM rule book is okay when it doesn't narrow the FAI lubricant down to only castor oil.

Spark Coils

In that same October column, I mentioned that I wasn't aware of any newly manufactured coils other than those being supplied by Larry Davidson. I expected that to attract information about any other sources of new coils, and it did. In addition to Larry's lightweight, 1-ounce coils, a heavier one is available from Model Engine Ignition called the Power Keg, which weighs 1.4 ounces.

Check the "Sources" for the Model Engine Ignition contact information. While you're on the website, peruse other good information that is related to spark coils and ignition systems.

Incidentally, I've heard more than one person mention modern automobile coils as another possible source of spark coils for models. Most cars today use smaller coils—one for each cylinder as opposed to a large single coil as was used in the past. I didn't carry that search very far because I quickly found that even those lighter coils typically weigh approximately 4 ounces each, require 6 to 12 volts, and have large, clunky mounting provisions.

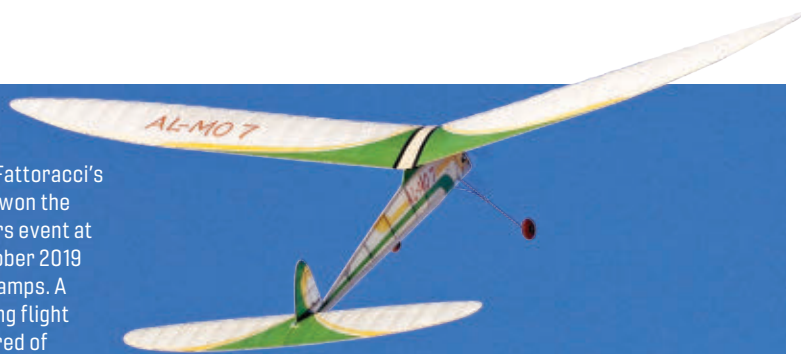
Shop Lights

I have trouble walking through a Harbor Freight store or even looking at the company's profuse advertisements without seeing something I need for model building.

When I was rearranging my garage workshop, I spotted a hanging LED light in the company's ad that looked similar to a long fluorescent light. It's lightweight, inexpensive, and excellent. It turns on and off like an incandescent light, as opposed to the flickering delay of a fluorescent one. Best of all, it brightens a larger area, with an easy-on-the-eyes color that is similar to mild sunlight.

Rated at 60 watts, it replaced two 120-watt floodlights with better lighting. I was so impressed that I bought a second one to complete the lighting in the entire garage. The switch is a drop-down pull chain. The only negative that I noticed is its relatively short cord that, in most cases,

Angelo Fattoracci's Al-Mo 7 won the Concours event at the October 2019 SAM Champs. A qualifying flight is required of Concours entries. Eaton photo.



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OLD-TIMERS



Dave Shrum's Primary Force, powered by a spark-ignition engine, looks good for having been rekitted three times. The aircraft is described in the text.

will require an extension. They were \$19 on sale and less than \$30 otherwise.

No, I don't own stock in the company!

A Reader Writes

Dave Shrum is an enthusiastic CL flier who had the following to say after reading the spark-ignition information in my October column.

"I've flown UC [U-Control; CL], RC, and FF [Free Flight] (well, I tried but could not quite get the hang of trimming). With my UC, I have flown for about 50 years and am considered a Sunday flier. I can fly a pretty fair pattern.

"Recently, I took a plane called Primary Force, which had been rekitted three times, and set out to experiment with it. The plane had an O.S. .35 engine with a 10 x 6 prop, turning 10,600 to 11,200 rpm. It flew okay, but I was disappointed as the corners were blah! From the pictures you can see that I

now have a sparky [spark-ignition engine] on it. It's a 1947 Atwood Triumph 51 with a 12 x 6 prop.

"I love ignition engines and want to enjoy them instead of letting them sit on a shelf. The plane, with coil and batteries, now weighs 48 ounces. On the first flight with the new engine, I hit the first corner, and then tried a square—wow! The Atwood turns only 7,800 rpm, but the performance change is incredible. In all my years and 30-some Stunt planes, I had never had a plane turn this well. A 90° corner is one thing but the 120°—again, wow.

"Yes, I know we have electric power for the Stunt planes and understand you can 'trim' that motor to do just what you want it to do. When you fly competition, that's the way to go. But for us old guys (81 now), we just want to get out to the field and have fun. Granted, these ignition engines do have a personality, but when you get one really running right, they are a blast!"

In further discussion, Dave and I agreed that regardless of what we'd like to believe, the main improvement probably came mostly from the altered propeller speed and diameter, and maybe a different weight distribution.

Just before closing this month's column, I received another message from Dave. He noted that the altered propeller speed and diameter had actually been done by Al Rabe in the 1960s with his Bearcat Stunt airplane. Al used a .60-size engine with a .15-size venturi that turned a large-diameter propeller. Dave said that he was judging at the time, and with the slower speed, he could clearly follow through and see each corner for the first time.

Dave also said that he's preparing a write-up about how to trim and run spark-ignition engines for CL flying and offered to email a copy to anyone who might be interested. His contact information is listed in "Sources."

SAM Talk

For those who are interested in exchanging information online about Old-Timer activities, there was a Yahoo chat group called SAM Talk. Some changes by Yahoo have forced SAM Talk to move to another forum. As of this writing, the new address and sign-up procedure seems to be working, but there's not much traffic so far.

Any bugs in the new system should be ironed out by the time you read this, and the old SAM Talk might be off the air. The new format will be less personal because posts will not go directly to everyone in the group, similar to email messages. You'll probably have to log on to see what's new. ✈️

SOURCES:

Model Engine Ignition

(937) 997-2000
www.model-engine-ignition.com

David Shrum

dnpshrum@charter.net

SAM Talk

www.sam122.sk/samtalk

SAM

www.antiquemodeler.org

Harbor Freight

(800) 444-3353
www.harborfreight.com

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SMALL-FIELD FLYING

Brodak Manufacturing has released its new B-29 Superfortress kit, which will be available by the time you read this. Designed for simple four-channel RC and electric power, it's perfect for smaller flying venues.



BUILDING SEASON!

By Pat Tritle | patscustommodels@gmail.com

FALL IS IN THE AIR as I write this, meaning that we're in for a couple of months of calm-weather flying, which is great for those of us who are into lightweight aircraft. It also means that we're closing in on building season, and that's something I can definitely get excited about.

It seems as though there are always at least a dozen projects that I'd like to tackle, and not being a fan of the cold, it's a great time to dig into some of the things that were sidelined because of the warmer temperatures.

There are two things that I do coming into building season. The first is to make a list of the things that I would like to accomplish. The other is to clean up and organize my shop to make room for new projects.

I'm okay with a little dirt, but I can't stand clutter, so when I say "clean," that means within reason. We all know how balsa dust can infiltrate places where most people don't even know there are places, so you'll never get it all no matter what.

On the other hand, clutter and the inability to find the standard tools we use all of the time can slow the process to the point of drudgery. Keeping tools organized and easily accessible will go a long way toward making any project more enjoyable.

Readers' Projects

Speaking of projects, this month brings us a variety of nice models. Because the aircraft range from featherweight to something more mainstream, I'll start small and work my way up.

To kick things off, John Pakiz sent photos of his No-Cal Grumman Wildcat.

SMALL-FIELD FLYING

It might appear that a No-Cal is a no-brainer, but despite the seemingly simple platform, these little models are art forms in their own right—and one that John has definitely mastered.

The Wildcat was primarily built from 1/16-inch square balsa and is covered with tissue. The wood propeller is hand-made. It took John a couple of tries to arrive at the right size and configuration. I've built some No-Cals, and although John makes it look easy, it's only because he's that good at it.

Moving up in size, we have Eric Strader's 38-inch wingspan Gnome. The model was designed by Eric's father, Ted Strader, and offered as a kit in the mid-1970s. The Gnome was originally designed for a Cox .010 engine and a single-channel, pulse-proportional radio.

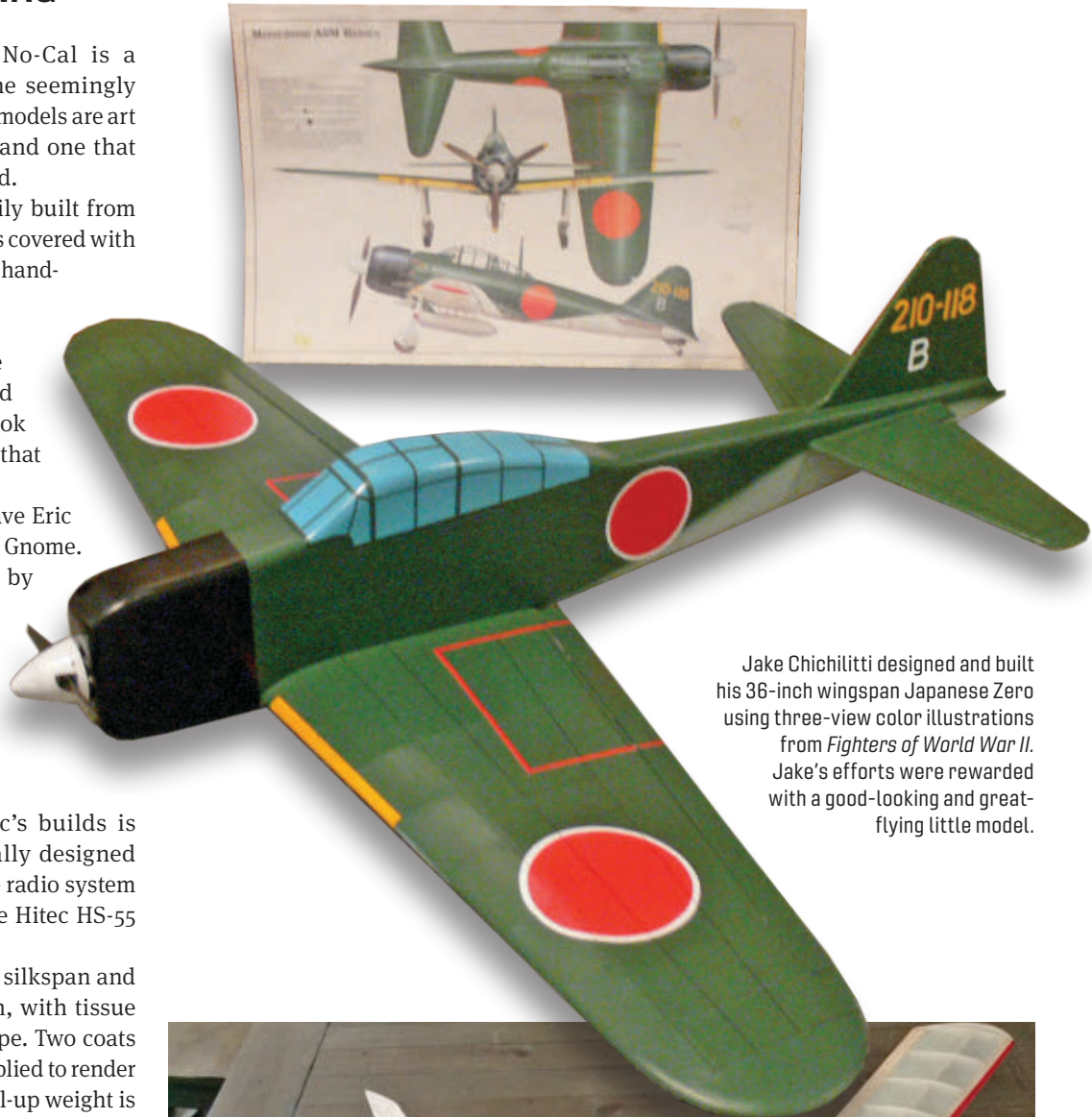
The most recent of Eric's builds is powered as it was originally designed using a .010 engine, but the radio system was updated using a single Hitec HS-55 servo to control the rudder.

The wing is covered with silkspan and the rest, including the trim, with tissue and two coats of nitrate dope. Two coats of clear epoxy paint were applied to render it fuelproof. The Gnome's all-up weight is 6 ounces and it flies beautifully.

From here, I'll move to Jake Chichilitti's Japanese Mitsubishi Zero. The model was scratch-built from Jake's own plans and drawn using three-view, full-color illustrations from the book *Fighters of World War II*.

The aircraft was designed with a 36-inch wingspan using an Eppler E205 airfoil and built entirely from balsa and plywood. It is powered by a Norvel .061 engine with three-channel RC. The Zero was built without landing gear or rudder control to keep the weight down. It uses a "bowling ball-style" launch to get things going. The model flies well, and will do all of the desired aerobatic maneuvers, even without rudder control.

The Zero is covered with Polyspan and painted using Brodak dope. The only fault Jake found in the design was that it required down-elevator trim, which is not



Jake Chichilitti designed and built his 36-inch wingspan Japanese Zero using three-view color illustrations from *Fighters of World War II*. Jake's efforts were rewarded with a good-looking and great-flying little model.



The Gnome was built by Eric Strader from a kit that his father designed in the 1970s. Eric has built several Gnomes using both electric and glow power, and either single- or two-channel RC.

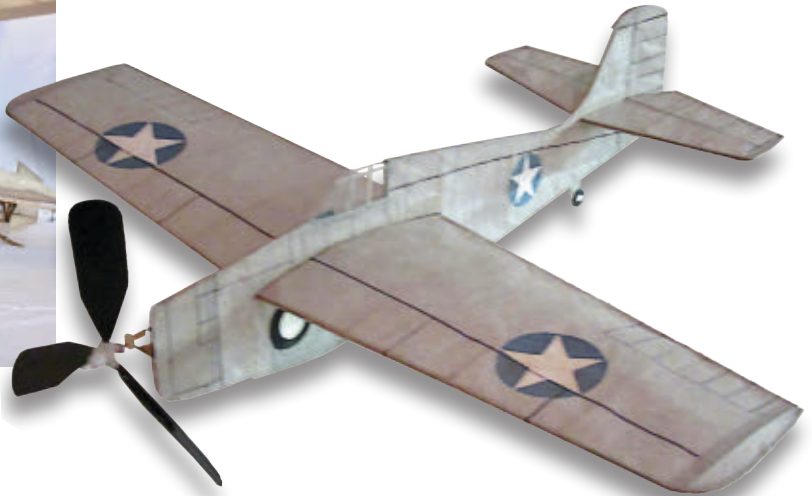


Glenn Dunlap did a remarkable job building this Avro Triplane. Study the photo closely and you'll see some beautiful detailing, as well as the level of complexity of the basic airframe.

uncommon with a new project. Because the actual setup between the wing and stabilizer is, at best, an estimate, the only way to know for sure is to try it. No fault is assigned to the designer—it's just part of the process.

The next aircraft up is Glenn Dunlap's Avro Triplane. I don't have any real details about the model, but as far as complex projects are concerned, the Avro Triplane is a monumental undertaking. That being the case, I'll let the photo do the talking.


John Pakiz built his 16-inch wingspan No-Cal Grumman Wildcat primarily from 1/16-inch square balsa. The handmade propeller required a couple of modifications to arrive at a perfect blade size and configuration.



Brodak B-29

For those who love warbirds and bombers, Brodak Manufacturing has expanded its line of multiengine kits with the B-29 Superfortress. The 60-inch wingspan B-29 is set up for four 400-class outrunner motors and four-channel RC. The system includes counter-rotating propellers to eliminate torque and uses four submicro servos for the flight controls. Power is provided by a 3S 2,200 mAh LiPo battery.

That's going to wrap things up for this installment. I like the variety of subject matter; much like everything that comes my way, the quality of material was once again at the top of the scale. From a Wildcat measured in mere grams to a B-29 measured in pounds—albeit only 2-1/2 pounds—the cross section of model types, power, and guidance (or lack thereof) is refreshing. It does my heart good to see modelers in action and the incredible work they're doing.

A hearty well done to all, and I'll catch you again next time around. 

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 TYPE ITEM
 CLAW 69006/60715/60714/47872
 RIP 69005/61262/47873
 57758517
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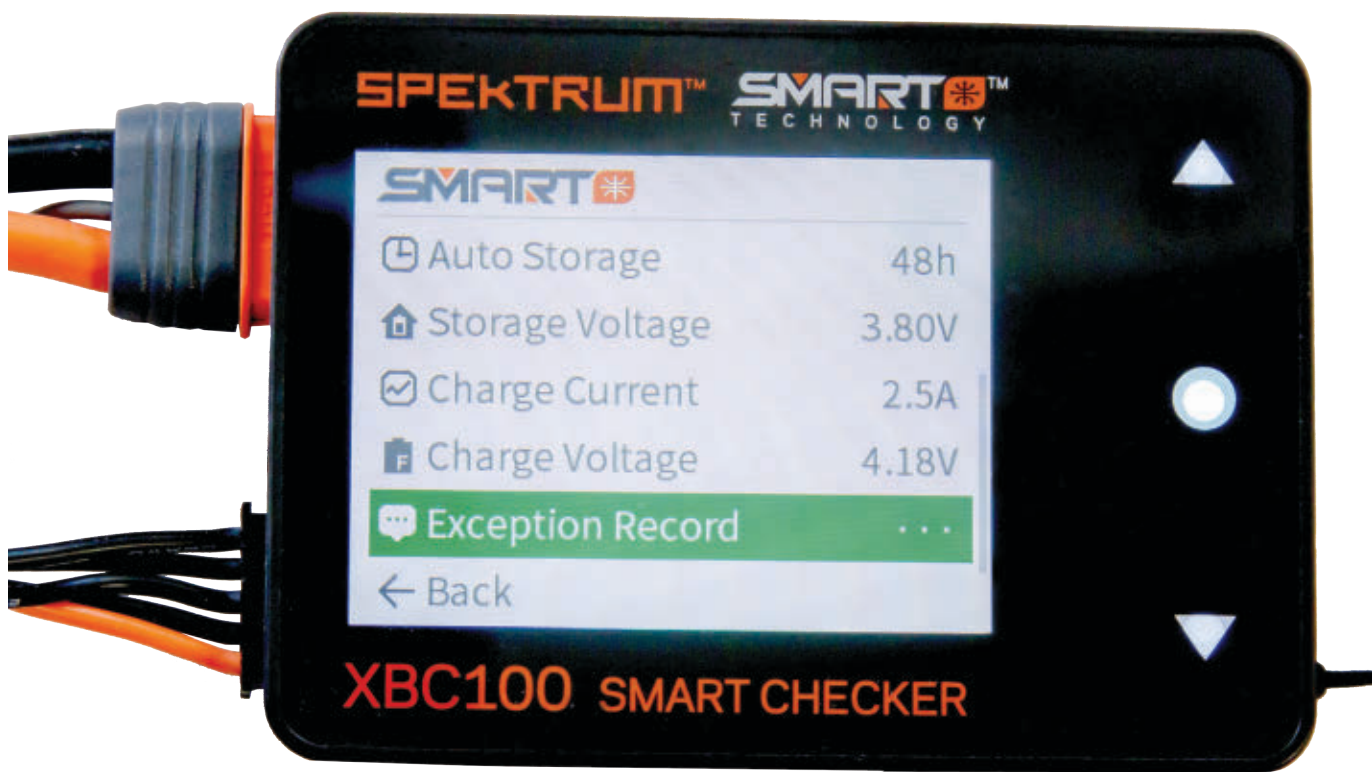
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The Spektrum XBC100 Smart Battery Checker and Servo Driver makes it easy to read the factory settings of the Smart LiPos and adjust them as needed. Here, the author has adjusted the automatic storage to begin after 48 hours of inactivity. The maximum charge is set to 4.18 volts, and the charge rate is set to 2,500 mAh.

GET SMART

By Greg Gimlick | maelectricks@gimlick.com

I'M NOT TALKING ABOUT “Get Smart,” the secret agent sitcom from the 1960s, but rather new technology from Spektrum. This is an advancement in our hobby equipment that I feel needs to be highlighted this month.

What Is “Smart?”

We hear the term applied to everything from TVs to refrigerators, and it means different things for each device. In most cases, it provides some sort of data communication that is otherwise not available. With the new Spektrum Smart technology, it provides the end user and the manufacturer a wealth of information, simplicity, and accuracy. With the additional safety it offers, it's a win-win situation for everyone.

The brains of the technology are buried inside of the LiPo battery packs. Each pack has a small circuit board inside of the wrapping that contains a microchip that logs all sorts of information. From that board, there is a third wire between the two main wires that exit the pack.

This third wire is connected to a third contact between the two primary contacts in the new IC3 or IC5 connectors. These connectors are compatible with the older EC series, although you lose the smart capability because it won't have the third wire connected. The benefit is that you can slowly switch over to the new system as your older packs need to be replaced.

Let's look closer at the various devices in the Smart line.

Smart Lipo Batteries

LiPo batteries with Spektrum Smart technology store data such as the

chemistry type, cycle count, charge rate, error logs, and more, plus programming options to customize them to your needs. They are available in many sizes, with more on the way, and prices are in line with similar-size batteries without the technology. There are also LiFe battery packs available.

Each one arrives with factory-set parameters, so they're ready to use out of the box. If you have a Spektrum Smart charger, you can simply plug it in and hit the start button—there is nothing to set unless you wish to override the factory settings. I'll have more on that later.

One of the great things that this new chip offers is a look at the health and history of your battery pack. If it has been overcharged, it is logged. Overheated? It's logged. Number of cycles? Logged! How about if you're one of those people who constantly flies below the normal low-voltage cutoff? Again, it's right there in the history. With a good warranty, this information protects both sides.

Are you one who comes home from the field with a couple of fully charged packs and forgets to put them in storage mode? The chip is programmed to self-store if nothing happens for a set period of time.

You can change that to suit your needs, but it will prevent you from leaving fully charged batteries sitting for days or weeks, only to increase resistance and reduce capacity. It's a low discharge current of approximately 100 mΩ, but it protects the pack.

XBC100

When I ordered my first batch of Smart



The author's initial purchase included three Smart LiPo battery packs, a charger, and a battery cell checker.

devices, the XBC100 Smart Battery Checker and Servo Driver was a must-have item. Take a look at its key features:

- Battery checker with built-in cell balancing.
- Advanced servo testing.
- Allows users to take advantage of Smart battery features and adjust them.
- Full-color display.
- Qualcomm 3.0-compatible USB power port with Quick Charge for compatible Android and iOS devices (up to 12 volts and 2 amps).
- Updated port for easy access to updates and new features.

When it's connected to a Smart battery, you can check all of the integrated parameters such as the number of cycles, and

events such as overdischarging and overheating. Smart battery settings, such as the automatic storage timer and preset charge current, can also be adjusted. When connected to a non-Smart battery, you can still balance by connecting the standard balance connector and using the USB functions, along with the servo driver features.

The XBC100 will balance each of your battery cells to within a ± 0.005 -volt accuracy. It's one heck of a device for \$40.

Smart S1500 DC Charger 1x500W

There are multiple chargers within the Smart line, but I chose the DC/DC 500-watt charger. All have similar abilities as defined by the Smart technology, but this is the one that fit my usage the best.

The S1500 charger's scroll wheel

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ELECTRICS



The new IC3 connector has a center pin to bring data to and from the circuit board in the Smart components. They are easy to grasp and compatible with the older EC series.



The Smart battery pack simply plugs into the charger and starts with a push of the center start button unless the user wishes to adjust any presets.



The Smart pack plugged into this charger is 5,000 mAh with a factory preset charge rate of 1.5C as shown on the screen.

interface simplifies setup. (Remember the iPod wheel? This is similar.) When used with Spektrum Smart LiPo batteries, the S1500 uploads specific parameters and health data from the battery's integrated memory chip and displays it on the LCD screen, giving you the information to evaluate your packs and make charging decisions. The charger is fully adjustable to accommodate any of your needs and provides information about the balance, internal resistance, etc.

For input power, a Spektrum Power Supply (SPMXC10201), or any compatible DC power source with the included IC3 power cable adapter, can be used. The S1500 charger has a USB port, a software update port, a safety timer, protection against heat, reverse polarity, short circuiting, overcurrent, and low-input voltage.

It's a lot of charger for \$120.

Keep in mind that you can charge non-Smart technology batteries too; it just won't automatically set things up. Because I parallel charge many of my smaller packs, this pocket-size unit gives me plenty of power to connect the parallel board but without Smart benefits.


More Coming!

A line of Smart ESCs is on the way! I've preordered so that I can get one as soon as it is in stock. I'm excited about what I've read. A lot of information will be available via telemetry that we didn't have before. Stay tuned for an update.

Wrapping Up

After using this equipment for a few weeks, I'm stoked. I changed some parameters for

my battery packs because I'm conservative and always charge at 1C. Some came programmed for more aggressive rates. I also adjusted the self-discharge timer to give me 72 hours before it did anything, but you can also disable it if you prefer. My packs have held up well through multiple cycles, and the data matches what has been derived from the more expensive testing gear that I use.

I encourage you to look into this new technology. I've converted multiple setups to it as old packs required replacing. The charger and battery checker/servo driver are exceptional! I'm also happy with the IC3 and IC5 connectors. They seem much easier to grasp than the EC series. 

SOURCES:

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SKY'S THE LIMIT

Some trips offer unexpected surprises, such as this beautiful Funk Model B airplane that was seen during a summer excursion.



WHEN LIFE GIVES YOU LEMONS, TURN TO FLIGHT

By Jennifer Reynolds | jensunshine3@gmail.com

WE'RE APPROXIMATELY A MONTH into the new year. If you're anything like me, it's a time to look forward with anticipation and excitement—I sure hope so anyway.

This past year had its fair share of disappointments for me. (Bear with me; I know it's not fun for a column to start off in downer mode, but it's going somewhere).

So, here is the doozy of a year that 2019 was.

Lemons

In February, my uncle died, only a few days after the anniversary of when my father died four years earlier. Although he had some health issues, we expected a good recovery—not a phone call that he had passed away.

The following month, I was in a hit-and-run car accident while stopped at a red light. Thankfully, I was able to remember the vehicle's license plate. Police caught up with him—and the stolen car he was driving. I'm fine and so is my car, although it was quite a shock.

Not too long thereafter, a family member suffered second-degree burns on her ankle and foot after someone at a restaurant table next to hers accidentally spilled a hot drink. In just seconds, the scalding hot water that was absorbed and held against her skin by her sock was enough to cause burns. I'm happy to say that she is doing well and has healed fine.

My husband then learned that his aunt passed away. We attended her celebration of life later in the year.

In May, I started having terrible tooth pain that ultimately led to a molar

extraction. On a side note, baby food isn't that bad! It's soft on healing gums, and the pear and pomegranate combination was rather good! Still, I prefer steak and chicken.

A few months later, I had a discussion with an RC pilot whom I hadn't spoken with at length in many years. It was bitter-sweet. Although there were moments of laughter and life clarifications, I also learned that this person had a health concern that, by his own admission, wasn't being properly managed. I left feeling somewhat out of sorts, and I continue to hope good things for his personal happiness and health.

And so it goes ... There's a reason people often talk about having "one of those years" or "one of those days." We all have these moments. However, there is often good that ebbs and flows in the midst of life's challenges, and I find that it's important to not lose sight of that.

That's where flying comes in. Much of the good that happened for me in 2019 was flying related.

Secretary

In 2019, I became the secretary of my flying club, the Winnepesaukee Radio

Controllers in New Hampshire. I've learned a lot, thanks to helpful members and officers who have shown me the ropes.

During this time, I played a role in securing our second flying field, approximately 40 minutes from our current one. To make this happen, other club members and I gave a presentation to the selectmen (town officials) about using an inactive landfill.

When we were speaking with a private landowner about the nearby landfill, he offered the use of his property instead. Although the landfill site would have been nice, the other option was more desirable, because there was much more flying space.

As the club secretary, I created a newsletter, *In the Loop*, which I send to all of the club members to recap our monthly meetings. I love doing this because it satisfies my creative side. I get to play with layout design and even throw in a fun "caption this" section at the end. These are usually images that I've taken around the field or during meetings that are just begging for silly captions.

Showing RC Models to Veterans

In 2019, I began volunteering at the New Hampshire Veterans Home. The residents



The author holds her official club officer pin now that she's the secretary of the Winnepesaukee Radio Controllers.

and staff are kind, wonderful people, and it was a pleasure to show everyone there our club's model airplanes.

The veterans got a kick out of the different types of airplanes that we had on static display at the New Hampshire Veterans Home. A handful of our members came out to help set up the display and speak with residents and the staff about the hobby, aerodynamics, and building.



Veterans take in the model airplanes at the New Hampshire Veterans Home. Photo courtesy of the New Hampshire Veterans Home.

SKY'S THE LIMIT



It was a year for receiving and wearing pins! In addition to Jennifer's club officer pin, she was proud to wear this nametag while helping out at the New Hampshire Veterans Home. Photo courtesy of the New Hampshire Veterans Home.



The year wouldn't have been complete without the flying club's annual trip to Polly's Pancake Parlor in New Hampshire. After enjoying a leisurely fall ride to the restaurant, the author and others stuffed themselves silly with great food and fun conversation.

husband and I take day trips with close friends. We were thrilled to come across a 1930s Funk Model B monoplane during one such trip. You never know what you're going to see while traveling, and it's always a bonus when it's something aviation related.

Although last year was filled with many upsetting events, there were also several enjoyable moments. I can always count on RC and all aspects of it to give me that lift—literally and figuratively—when it matters most.

How has RC modeling given you a boost when you seemed to need it the most? Shoot me an email about how the hobby has been there for you through good times and bad. I always like hearing from you. ✈️

Trips With Club Members

Every year, our club's annual trip to Polly's Pancake Parlor takes place. Several members and their spouses meet nearby, and then we head to beautiful Sugar Hill, New Hampshire. We travel on scenic back

roads, with many of us on motorcycles. It's a leisurely drive that ends with us stuffing ourselves silly with good conversation and, of course, pancakes and chicken maple sausage.

Other times throughout the year, my

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THE DEAL WITH DRONES

The AcroBee from NewBeeDrone uses Betaflight to run its flight controller, giving a pilot the ability to fine-tune flight characteristics.



BRUSHED VS. BRUSHLESS MICRO QUADCOPTERS

By Matt Ruddick | mattr@modelaircraft.org

AT THE END OF 2018 and into the beginning of 2019, the landscape of micro drones began to shift sharply in a new direction—a direction pointing toward new, slightly larger micros with brushless motors. Until this point, mainstream micro drones were using less powerful brushed motors for a variety of reasons. They were cheaper, smaller, and more suited for indoor flight.

We now find ourselves with more choices thanks to the smaller and less powerful brushless motors that have entered the market and brought with them enticing new quadcopters, checking many of the boxes that experienced FPV pilots are looking for. They have the ability to perform the same aerobatic tricks that can be done on larger mini quad rigs, and, of course, they have more speed!

As I sat back to watch these brushless quads take off, I began thinking about whether a brushless-powered micro drone would actually perform better across the board. How would a brushed quad stack up against a brushless quad in a real-world situation?

First, what are the advantages to flying a brushless micro quadcopter? A few easy ones come to mind, such as top-end speed. You can expect that brushless setup to give you more speed for longer distances.

You can also expect a more responsive feel with your inputs and generally tighter handling, although other factors can play into this. Brushless motors often last much longer than a brushed motor set. Many brushed motors are rated to last for approximately 5 to 7 hours of use, while brushless motors can last significantly longer than that if treated with care.

So, that seems like an easy choice, right? Well, not exactly. Brushed motors have their own set of perks. First, they're less expensive than their brushless brothers. At roughly half the price, brushed motors are easier to pick up and keep spares on hand. They're also suited for smaller flying areas, such as home courses and smaller race tracks. Their ability to be nimble at lower speeds makes it easier to navigate in smaller spaces, and they are often considered to be safer thanks to the slower rpm.

With those points in mind, what should we expect when flying the same course with both a brushed micro quadcopter and a brushless micro quadcopter?

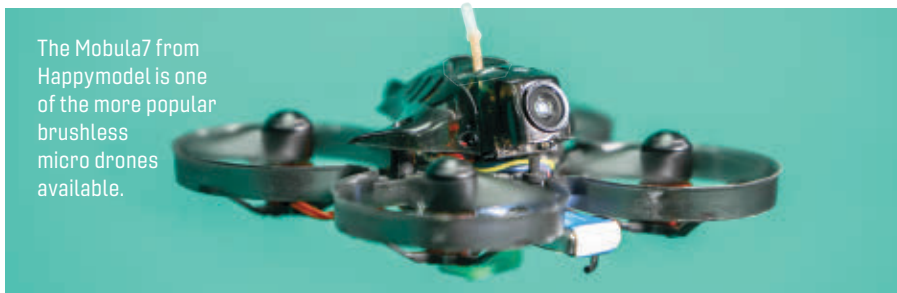
I tested four quadcopters on the same indoor course. There were numerous tight turns, gates, and obstacles to avoid, along with a couple of longer straights where speed could be a factor.

The brushed quads I used were an AcroBee from NewBeeDrone that featured the BeeBrain Lite flight controller and a Tiny Whoop racer. The brushless quads I used in testing were a Happymodel Mobula7 and a Blade Inductrix BL. It's worth noting that each quadcopter was flown in Angle mode for these tests.

First, from a handling standpoint, I found that each quad had its benefits. As an example, the Mobula7 flew as though it was on rails, holding tight to each turn and carrying speed when needed. However, the extra speed I carried down the straights forced me to slow down more often to make the turns compared with the brushed models. The AcroBee was comfortable and effortless in flight, requiring less stick precision and yielding smoother lines throughout the course.

What surprised me the most, however, was the lap times. Using the Whoop Laps app, I kept finding that my lap times were comparable across the board. After 10 runs on each model, the average lap time for the brushed quads was 0:34.9 seconds, while the average lap time for the brushless quadcopters came in at 0:33.4 seconds.

Did that mean that a brushless quad was the winner in this head-to-head comparison? Well, not exactly. Although the brushless pair averaged a second-and-a-half faster on my test track, I felt more comfortable flying the AcroBee than either of the brushless quads. I was calmer throughout the runs, which resulted in what I felt was



The Mobula7 from Happymodel is one of the more popular brushless micro drones available.



The Blade Inductrix BL brings Bind-N-Fly convenience to the brushless micro world.



The original Tiny Whoop racer is one of the most-flown micro drones and is used by micro racing pilots around the world.

a smoother flight experience. This led me to my secondary test: the head-to-head race.


If races could be finalized after the qualifying rounds, many would have very different outcomes, and this test was no different. I decided to put the Mobula7 against the AcroBee in a series of head-to-head races to find out if the lap times would translate to a real race situation.

As I suspected, the tight turns and obstacles on the track were easier to navigate using the brushed models; however, what surprised me was the ability of the brushed quads to stay on pace down the straights alongside the Mobula7 and Inductrix BL. In fact, in a couple of instances, I found that the AcroBee passed the Mobula7 while drag racing down the straights before approaching a sweeping left turn.

Race after race, neither side came out with any dominance. Of the 10 races, six were won by a brushed quadcopter, and four were won by a brushless aircraft. This less-than-scientific result was certainly one that I had not suspected.

I wasn't sure which side would come out on top, but I was certain that there would be a clear winner. The data proved me

wrong in this instance. My observation that I felt more comfortable flying the AcroBee than either of the brushless quads got me thinking that it might be possible for the performance differential to be offset by the comfort level and familiarity of the pilot.

Although it might not be as simple as stating that one choice is better than the other, it's also not as simple to say that newer is always better. I, for one, won't be retiring my brushed micro quads any time soon, but I plan to give these brushless beauties a little time to settle in. After some practice, they just might find a new home in my fleet. 

SOURCES:

NewBeeDrone
www.newbeedrone.com

Tiny Whoop
support@tinywhoop.com
www.tinywhoop.com

Happymodel
info@happymodel.cn
www.happymodel.cn

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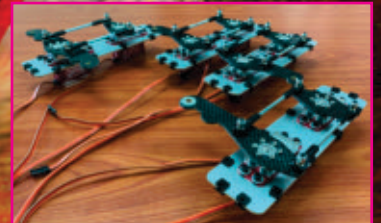
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RC GIANT SCALE

Pert Asiatico and Steve Peckham exhibit their Peter Barth 33% Waco YMF-5.



CLASSIC WACO BIPLANES

By Sal Calvagna | rcgiants@optonline.net

IT'S HARD TO BELIEVE that we're in 2020. The old adage is true: The older we are, the faster time speeds by. Unfortunately, it doesn't work that way with finishing model aircraft; it still takes what seems to be forever to complete one.

I hope that all of my readers enjoyed a happy and healthy holiday season. Now that the holidays are over, let's get back to modeling so that we are all ready for spring.

Here are a couple of popular and classic Waco models in 33% and 40% sizes. Enjoy.

Pert Asiatico of Virginia Beach, Virginia, and Steve Peckham of Norfolk, Virginia, collaborated on a Peter Barth 1/3-scale Waco YMF-5. As the story goes, Steve had an unemployed Moki 215 radial engine that was looking for a home, and Pert found a framed-up Waco. Having been friends for approximately 20 years, and both being detail oriented and students of history, they divided the work to complete this RC Giant.

Pert finished the construction and made the detailed cockpit. Steve painted the model using PPG paint, installed the electronics, plumbed out the tanks, and designed and built the windshield. The model spans 118 inches, is 93 inches long, and weighs 53 pounds. It's controlled with a Futaba 14MZ radio using Hitec servos.

The Waco was modeled after a full-scale sightseeing aircraft that operates in Florida. Both men fly the model airplane, but Pert readily admits that Steve is more comfortable with putting it through its paces.

For more information about the 33% Peter Barth kit, visit the Vogelsang

Ground transportation for Pert and Steve's Waco is provided by a custom towing cradle that protects the wheel pants from damage.



Aeroscale website, listed in "Sources." Great work, gentlemen!

Bill Conklin of Greensboro, North Carolina, is shown in the photo with his huge 40% Aircraft Modeler's Research, Inc. (AMR) Waco YMF-5D. The model spans 142 inches, has a length of 108 inches, and weighs a hefty 115 pounds. Bill powers the Waco with a Moki 400 radial engine and uses a JETI radio for control. The Waco is covered with Stits Lite material and is painted using urethane aircraft paint.

The famous WACO Aircraft Corporation started in the 1920s as the Weaver Aircraft Company of Ohio, but changed its name a number of times. The company built many types of airplanes, including open-cockpit biplanes, cabin biplanes, cabin sesquiplanes, and other experimental aircraft. They were rugged and reliable aircraft. Moving forward, the WACO Classic Aircraft Corporation of Battle Creek, Michigan, was founded in 1983 and is the world's only FAA- and European Aviation Safety Agency-approved builder of the classic 1930s-era sport biplane.

Unusual Sopwith Dolphin

Roy Vaillancourt of Selden, New York, recently completed his newest design, a 1/3-scale Sopwith Dolphin that spans 130 inches and is powered by a DLE-85 gas engine. The model is covered with Solartex and painted with exterior latex. The plans, parts, and accessories will be available soon from Nick Zirolì Plans.

The Sopwith Dolphin is certainly not the first aircraft that comes to mind when discussing World War I aviation, but here are



Bill Conklin displays his huge 40% Waco YMF-5D that was built from an AMR kit.

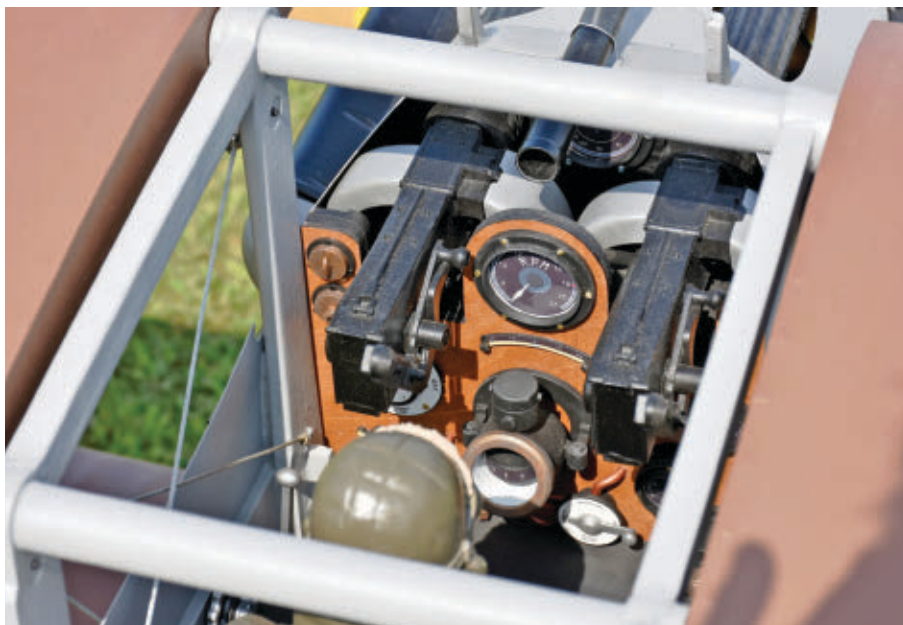


Roy Vaillancourt is shown with his 1/3-scale Sopwith Dolphin. Check out the reverse wing stagger.

RC GIANT SCALE



This shows the Dolphin's front-end detail. All of the parts will be available from Nick Zirolì Plans.




A close-up of the Dolphin's cockpit detail.

some little-known facts about this unusual fighter.

The Dolphin was the first British fighter to carry four machine guns: two Vickers guns and two Lewis guns. In mid-June 1917, a prototype was sent to France for continued trials; however, the odd configuration confused allied anti-aircraft gunners. They fired on it, thinking it was an enemy aircraft. There were also several incidents where allied pilots attacked the Dolphin, thinking the same.

The Dolphin was fast, maneuverable, and easy to fly. The American forces purchased five examples and shipped four of them to the US for evaluation. Approximately 2,070 were produced; however, at the time of the Armistice in October 1918, nearly 1,500 were stored awaiting engines, and then scrapped. They were quickly retired after the war and declared obsolete in September 1921.

That's all for now. I hope to see you at the field in the spring. 

SOURCES:

Vogelsang Aeroscale

(919) 533-6275

www.aeroscale.shop

AMR

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Nick Zirolì Plans

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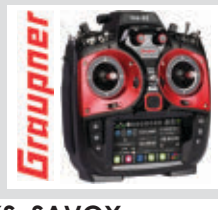


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RC SLOPE SOARING



The Leading Edge Gliders P-80 is shown with four ballast options: 8 ounces, 11 ounces, 15 ounces, and 24 ounces. A metal serving spoon was used as a form for ballast fabrication. Use appropriate safety precautions when you are working with lead.

BALLAST

By Ken Hawkins | slopemaster33@gmail.com

THIS MONTH, I would like to discuss the use of ballast on Slope Soaring gliders from a practical perspective. But first, here is a quick review of the math that is involved in determining a glider's wing loading.

Wing loading for model aircraft is usually expressed in ounces per square foot of wing area. The wing area of model aircraft is typically expressed in square inches. To find the square feet of a model, take the wing area in square inches and divide by 144:

$$\begin{aligned} \text{Wing area in square inches} \div 144 &= \text{square feet} \\ 12 \times 12 \text{ inches} &= 144 \text{ inches (equals one square foot)} \end{aligned}$$

To determine the wing loading, divide the glider's weight in ounces by the square feet:

$$\text{Weight in ounces} \div \text{wing area square feet} = \text{ounces per square foot}$$

Let's use my Leading Edge Gliders P-80 as an example. It weighs 50 ounces and has an approximate wing area of 510 square inches:

$$\begin{aligned} 510 \text{ square inches} \div 144 &= 3.54 \text{ square feet} \\ 50 \text{ ounces} \div 3.54 \text{ square feet} &= \text{a wing loading of } 14.1 \text{ ounces per square foot} \end{aligned}$$

Model aircraft builders have traditionally been conditioned to build light. Lightweight models offer several advantages. Their low wing loading requires

less lift to remain aloft, they are generally more maneuverable, and they have a lower stall speed, allowing for a slower landing approach.

There are a couple of drawbacks to light-weight gliders though. They are easily disturbed in turbulent conditions, and the higher-drag designs have difficulty penetrating strong wind.

Most of us have experienced a windy day where we have launched our gliders, only to have them instantly blow back over our heads, similar to a paper plate at a spring picnic. For a glider to make forward progress—to penetrate the wind—it must be able to fly at a speed greater than the oncoming wind speed. This leaves us with two options: Decrease the glider's drag (which isn't viable if it is already built) or increase the glider's wing loading.

Increasing a glider's wing loading by adding ballast (weight) increases the speed at which it must fly to produce enough lift to sustain flight. Surprisingly, the glide ratio of a glider is not affected by its weight. A heavier glider will sink faster than if its weight was reduced, but it will cover the same distance if launched from the same altitude.

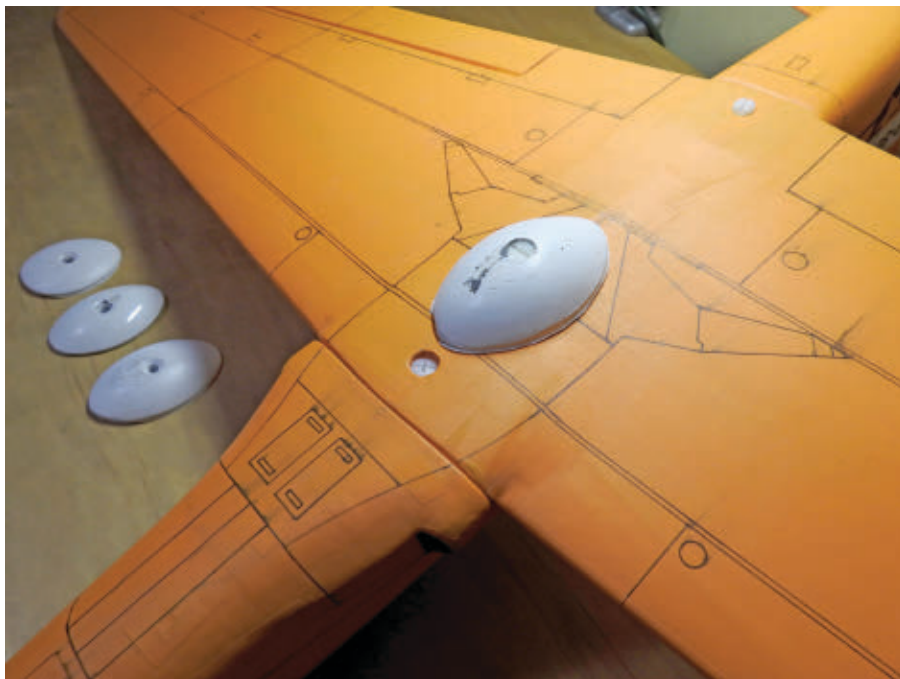
A good analogy for increasing wing loading is with pinewood derby cars. If you take two equally built cars and add more weight to one car, the heavier car will typically reach the finish line first.

Although a heavier glider can penetrate more effectively in stronger wind and is less affected by turbulent air, there are disadvantages. A heavier glider will be less agile than a lighter glider, and it will have an increased stall speed unless it is equipped with flaps.

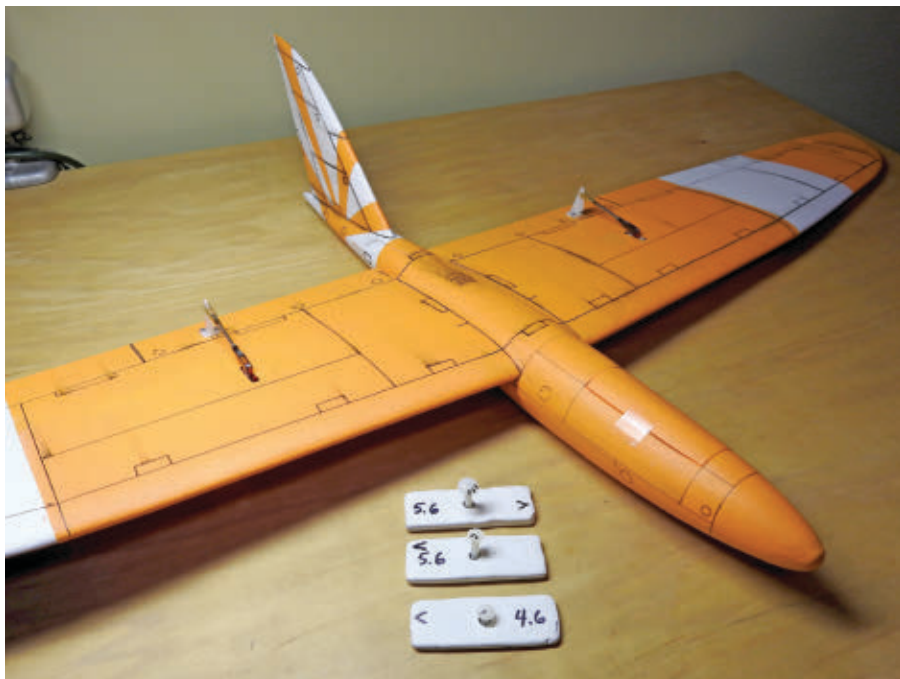
Before adding ballast to a glider, there are some important considerations. The wing spar system must be able to support the extra weight under all flight loads. Because the glider will be flying at a higher airspeed, wing and control surface flutter might also become a problem.

I have witnessed pilots add an excessive amount of lead to a lightly built model, only to have it explode in flight because the airframe was overstressed during high-G maneuvers or when encountering turbulence.

Most gliders that are specifically designed for Slope Soaring will benefit from ballast during strong wind



The P-80, with 24 ounces of ballast installed, provides a 21-ounce-per-square-foot wing loading. The ballast is secured directly at the CG with one 1/4-20 nylon wing bolt that threads into an anchor plate in the fuselage.



A Steve Drake SR-48 is shown with ballast options. Individual ballast can be installed separately or all together to provide up to 15.8 ounces of total ballast.

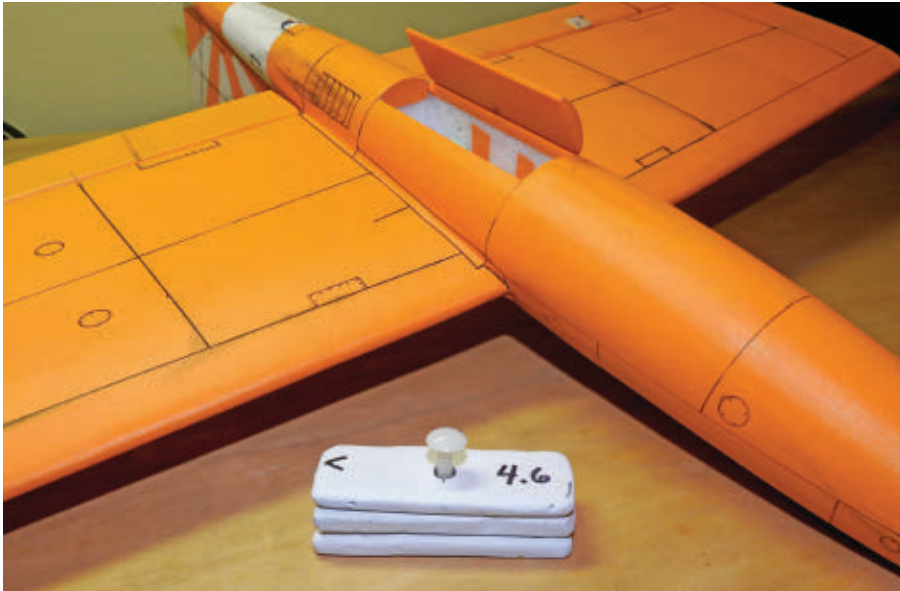
conditions, but a glider such as a polyhedral floater will probably not benefit because of its inherent airframe drag.

How much ballast you should add to your glider not only depends on wind velocity but also on the slope itself. The P-80, when flown at Pickles Butte, Idaho,

with 30 mph wind, will perform wonderfully with a 24-ounce ballast load that gives it a 21-ounce-per-square-foot wing loading. At Swan Falls, Idaho, with the same wing loading and wind velocity, the P-80 will fly sluggishly.

The reason for the performance

RC SLOPE SOARING



Three stacked ballast plates, weighing approximately 5 ounces each, are shown with the SR-48. The ballast is painted white to help protect the author from handling exposure.



Full ballast is installed on the SR-48 using a 10-24 nylon bolt. The ballast is fully internal and located on the CG with the hatch.

difference between these two slopes is their shape. The wind at Pickle produces both a strong vertical and strong horizontal component. The glider's higher wing loading helps penetrate the horizontal component.


Swan Falls is a nearly vertical cliff, so most of the wind velocity is a vertical component, with little horizontal. In this case, the ballast is just along for the ride.

If you have one or two slope flying sites that you fly at on a regular basis, experiment with different ballast loads under different wind conditions. Start without any ballast and work your way up. Just remember that the ballast must be secured directly on the glider's center of gravity (CG).

If the glider is already built, securing external ballast might be your only option. If you are planning a build, consider an internal ballast system. Some pilots prefer to build several gliders at various weights rather than using ballast.

You will know when you have the right amount of ballast for the conditions because the glider will fly with much more speed and authority. If you've added too much ballast, the aircraft will feel sluggish, and it will be difficult to remain aloft.

Flying a heavily ballasted glider on a windy day is exhilarating. The glider will have more kinetic energy, allowing big maneuvers such as loops and half pipes. It can feel like you're flying a powered sailplane.

Until next time, ballast up. 

SOURCES:

Leading Edge Gliders

(785) 658-6291

www.leadingedgegliders.com

Steve Drake RC Sailplane Products

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www.stevedrake.com

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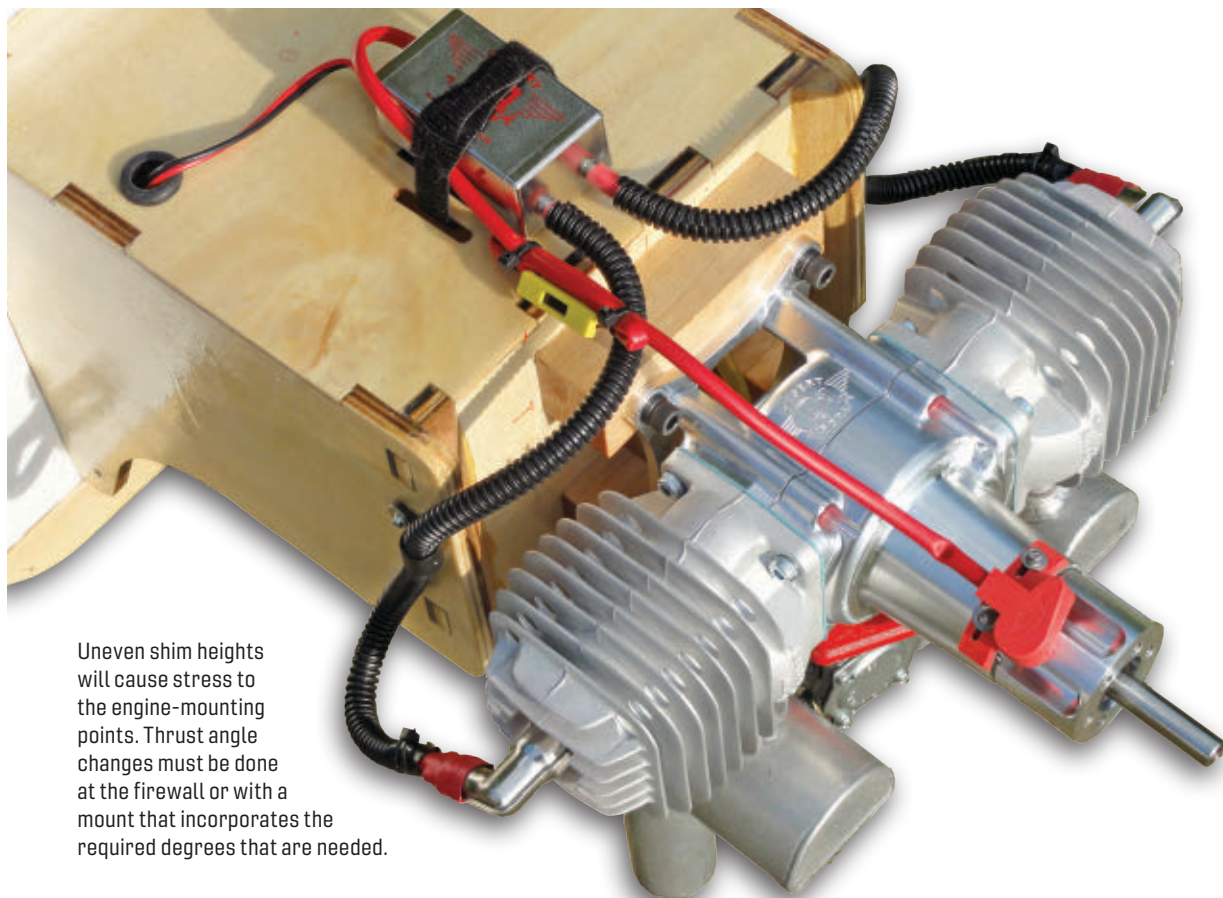


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Uneven shim heights will cause stress to the engine-mounting points. Thrust angle changes must be done at the firewall or with a mount that incorporates the required degrees that are needed.

THE PERFECT SETUP

By John Glezellis | jglezellis@gmail.com

BECOMING THE BEST International Miniature Aerobatic Club (IMAC) competition pilot not only hinges on developing flight skills, but also knowing how to properly adjust the aircraft to meet the demands of the sequence at hand. Having incorrect engine thrust angles, for example, requires corrective inputs throughout a routine that result in unnecessary downgrades. Don't let this happen to you!

Throughout this column, I will discuss a few key adjustments for the perfect setup of which everyone should be aware. I will specifically examine how you can test for—and adjust—the engine thrust angle, as well as the wing and horizontal stabilizer incidence angles.

Without further hesitation, let's begin!

Proper Engine Thrust Angles

Always start with the engine thrust angles recommended by the manufacturer. To check these angles, I use a digital angle meter such as an E-flite AnglePro II 5-in-1 Digital Throw/Incidence Meter.

As an example of how this can be used, simply zero the unit on a reference point, such as the top surface of the engine box, and compare that angle with the angle of the firewall to check the up/down thrust angles. Positioning the aircraft on its side, you can then check for right or left thrust in a similar manner.

After the correct angles are confirmed, take to the sky when no wind is present. If there is wind, the airplane might lean into it, making it appear that you should change the engine thrust angle when, in fact, it might be wind related.

Make certain that the wing is level with a moderate entry speed and perform a gradual pull to establish a vertical upline. Note in which direction the aircraft leans (yaw, pitch, or both) in the first few hundred feet of the vertical line. With that stated, how do you know exactly how much of an angle change is needed?

Former Tournament of Champions competitor Peter Goldsmith uses an interesting technique. During vertical tests, he prefers to apply rudder trim until the airplane tracks perfectly vertical. After the proper amount is applied, he lands the model and uses a protractor to measure how many degrees of rudder input were needed to maintain a perfectly vertical upline. He then divides the value by two, which will be the amount of thrust required. This tip is fantastic because it eliminates any form of guesswork and provides a great starting—if not final—thrust angle amount.

Engine thrust adjustments should be made by angling the firewall or by installing an engine mount that has a certain amount of offset incorporated within the design. One such manufacturer is SWB MFG, which offers a few mounts that have 0°, as well as 2.5°, of thrust built into the mount.

Be cautious when using washers behind the engine because uneven spacing heights, as well as excessive standoff spacers, will cause stress to the engine-mounting points. In fact, this could lead to damage to the engine case, which

is common with high-performance engines that are lightened to the maximum extent possible.

Some pilots prefer to use a programmable mix from their computer radios so that when higher throttle amounts are used, corrective rudder input is automatically applied via the radio. This is called a throttle-to-rudder programmable mix. Although this approach saves time, it is also speed sensitive. I prefer to mechanically adjust my model for perfection.

Incidence Fundamentals

As an overview, the angle of incidence for a fixed-wing airplane is the angle between the chord line of the wing where it is secured to the fuselage and the datum line of the model. To simplify this, the chord line for a fully symmetrical wing would divide the airfoil in half to form upper and lower halves.

The datum line of the airplane is a line from which all angles are measured and is often referred to as the centerline. On most models that I've owned, the fuselage canopy hatch area is parallel to the datum line. Never make this assumption, and always check with the aircraft's manufacturer.

Now that you have a basic overview of what is meant by the angle of incidence, let's discuss the impact that it has on the given flight characteristics of an airplane.

In calm weather conditions, as you did

earlier for proper engine thrust angles, take to the sky. At a high altitude, reduce the throttle to idle and perform a gradual 90° push to establish a vertical downline and release elevator input. If you notice that the airplane pulls to the canopy, you might have to either decrease the wing incidence or increase the tail incidence. If the model pushes toward the landing gear, you might have to increase the wing incidence or decrease the tail incidence.

If there is only a slight amount of pitch change, a throttle-to-elevator mix can be applied so that a touch of elevator input is given when the throttle is brought to the idle position. If there is a noticeable pitch change at different flight speeds, you must look at the incidence of the wing and/or tail.

Measuring Basics

Before you make any changes, make sure that you have explored all possibilities with respect to trimming your aircraft. For instance, if the center of gravity (CG) is not correct, you might find yourself in a battle between the CG, engine thrust angles, and wing incidence angles. I recommend that you place a center mark on the horizontal stabilizer at the leading edge and the wing in addition to the fuselage, so that no matter what adjustments are made, you can always return the aircraft to the original positions.

To measure the incidence of the wing, I would first place the AnglePro II incidence meter, which measures in degrees, on the

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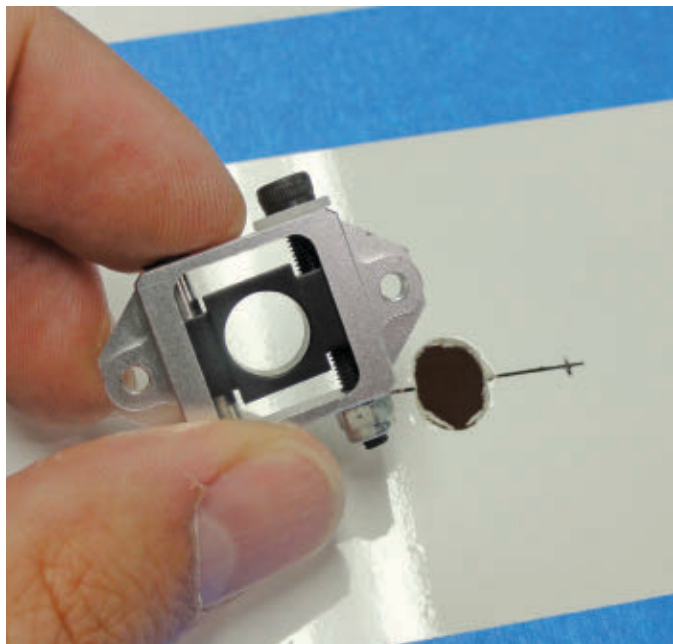


When making small engine thrust angle changes, it is common for the spinner to not align perfectly with the front of the cowling. Always remember that you can make small cosmetic changes to correct for this, but having a properly tuned aircraft is important.

top of the fuselage crutch if that is a known reference point from the manufacturer. Zero the meter at this point then move the meter to either wing panel and/or the horizontal stabilizer and see what the result is.

To make any adjustments, some aircraft feature adjustable antirotation devices for a two-piece wing, whereas others have either a wooden or composite antirotation rod that is secured to the wing and inserts into the fuselage side. Simply elongating the hole that is located on the side of the fuselage and repositioning and gluing a plywood disc on the inner side of the fuselage that is set to the proper incidence angle will readjust the wing and/or stabilizer angle.

If your airplane features a one-piece wing, incidence angle changes are a breeze. Simply insert a spacer, such as a washer,



Adjustable mounts can be used to easily adjust the wing and/or tail incidence.

between the wing and the fuselage in the appropriate locations. If you have a model that has four bolts that secure the wing in place, for example, inserting a washer per rear bolt between the wing and the fuselage will result in positive incidence.

If you place a washer per front bolt, the result will be negative incidence. Different wing installations could require a builder to be creative.

Final Thoughts

In closing, properly setting the engine thrust, wing, and horizontal stabilizer angles is extremely important. Although there is no doubt that finding the right thrust and/or incidence angles can be challenging and time-consuming, you must remember that patience will pay off. The goal is to decrease a pilot's workload and minimize any unnecessary corrective inputs so that you can focus on one thing: perfecting the latest aerobatic sequence!

Until next time, fly hard! 



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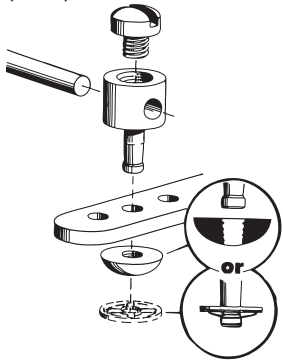
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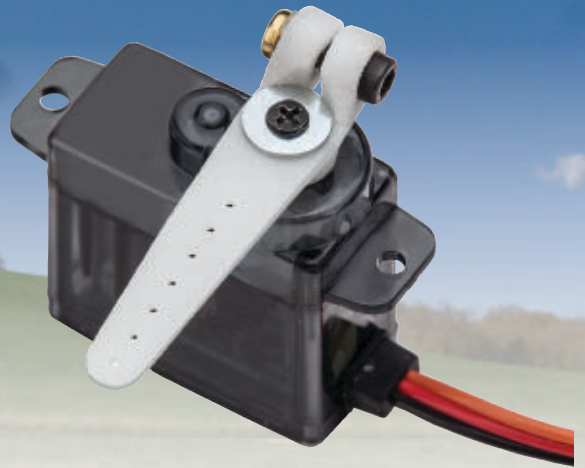
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The scratch-built, 80-inch wingspan Camera Plane that the author used for flight testing weighs 12-1/2 pounds.

E-FLITE POWER 60 MOTORS

By Fred Cronenwett | clscale@rocketmail.com

THIS IS A COMPARISON OF THE E-FLITE Power 60 400 Kv motor and the 470 Kv motor. Physically, the two motors are identical in how they mount to the model and their overall lengths and diameters, but that is where the similarity ends. The two motors use different propellers and ESCs.

The motors were tested on the ground for power (wattage) and amps with different propellers to figure out the differences between them. I used E-flite's published specifications as a starting point to choose the propellers that were used for the testing. I did both ground and flight tests using an 85-amp ESC and two 3S LiPo batteries in series to create a 6S battery combination.

I used my 80-inch wingspan Camera Plane. It weighs 12-1/2 pounds and has 1,120 square inches of wing area for the flight testing. This model was originally designed around a .90 four-stroke engine to carry a 3-pound, 35 mm camera, which is why the model is so large. I converted it to electric power several years ago and currently fly it with a Power 60 brushless motor.

Reading through the specifications for the 400 Kv motor, my Camera Plane is larger and heavier than what E-flite recommends for this motor. Based upon flight experience with this airplane and the 400 Kv motor, I knew the performance would not be up to what I was looking for.

Ground-Run Test Results

The wattmeter was connected between the ESC and the battery and measures watts and amps for a given throttle setting. This will tell you if

the propeller you want to use will require more amps than what the ESC can handle.

If the ESC or the motor cannot handle that many amps, you will need to choose a different propeller or you will risk burning up one or both of them. As you try different propellers, the power and amp readings will change.

Motion RC sells the 180-amp GT Power Watt Meter and Power Analyzer, which is worth buying. The wattmeter that I use was made by Astro Flight and is more than 20 years old. You don't fly with this installed on the aircraft, but it's used on the ground runs to verify that the propeller you chose will not exceed the amp rating of the model's ESC. It also tells you how much power the motor, battery, and propeller combination has.

The 400 Kv motor peaked at 1,203 watts with a 6S battery using a 16 x 8 APC thin electric propeller at 56 amps. The 470 Kv motor peaked at 1,760 watts using a 17 x 7 APC thin electric propeller at 78 amps. The best power combination, based upon flight tests for the 470 Kv motor, was probably the 16 x 8 propeller at 1,615 watts and 80 amps.

You probably noticed that the 470 Kv motor has considerably more power and requires a larger ESC. I used a Motion RC 85-amp ESC for all of these ground and flight tests. I will keep the 400 Kv motor for smaller models that are in the 60- to 70-inch wingspan range.

Power 60 400 Kv Motor

Based upon the ground tests and flight tests, the Power 60 400 Kv motor does not have enough power to fly the 12-1/2-pound Camera Plane unless it's at a higher throttle setting the entire time.

The 400 Kv motor is better suited for a model in the 8- to 10-pound range (60- to 70-inch wingspan as previously noted) as the specifications suggest. The propeller I liked best for this setup was the 16 x 8 APC thin electric propeller. Test your propeller and battery combination to make sure you get an ESC that can handle the amps. I have used a 65-amp ESC and 16 x 8 propeller with this motor without any problems.

Power 60 470 Kv Motor

This motor can handle a larger, 9- to 12-pound aircraft because it has more

power, but it will require the 85-amp ESC using the same 6S LiPo battery. You might need to increase the mAh capacity of the LiPo battery with this power combination if your flight times are too short.

Remember, the voltage of the LiPo will not determine how long you can fly it; the battery's mAh rating will increase the flight times. I currently use 3,000 mAh batteries (two 3S in series) to create a 6S battery for the Power 60 motor. If I wanted to increase the flight times, I would have to install 4,000 mAh-rated 3S batteries in series.

How Many Watts Do You Need?

I use the rule of 120 to 140 watts per pound to determine how much power I need to fly an airplane. If the model weighs 3 pounds, you will want to have between 360 and 420 watts of power available. This will allow you to have reserve power to climb for a 45° high flight, a wingover, or for a full-power takeoff. You can then throttle back to half power for the cruise portion of the flight.

If you're looking at a multimotor aircraft, take the model's overall weight and divide it by the number of motors. In the case of my 14-pound B-29, each of the four motors are responsible for 3-1/2 pounds. I would need between 1,680 and 1,960 watts of power to follow that rule.

The four Power 25 870 Kv motors have 2,400 watts of power available. Based upon how the model flies, this makes sense. I have much more power than I really need, so the B-29 can easily cruise at half power.

Other E-flite Motors

E-flite has electric motors for small park flyers, from Power 90 and Power 110 motors up to the Power 160, which uses a 10S LiPo battery and requires a 110-amp ESC. The number next to the Power name gives you some idea of how much power it has compared with a glow engine.

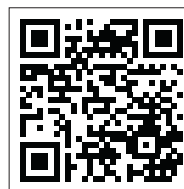
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at Buder Park in St. Louis, on June 27, 2020, to celebrate the 60th anniversary of Buder Park as an official CL flying site. Check the 2019-2020 events on the club's website (see the following contest list) for full details, as well as the AMA Sanctioned Event Calendar.

Check out the feature article about Buder Park in the September 2019 issue of *Model Aviation*, which discusses the history of this flying site. You can fly on the square pad where people have been flying CL since 1960!

2020 Contest Calendar

- June 15-20: Brodak Fly-In, Carmichaels PA; <https://brodak.com>
- June 27: Buder Park CL Fun-Fly, St. Louis MO; www.lafayettesquadriellecl.wordpress.com
- July 17-19: CL Scale Nats, Muncie IN; <https://amablog.modelaircraft.org/nats>
- September 19: Broken Arrow CL Stunt and Scale, St. Louis MO; www.lafayettesquadriellecl.wordpress.com

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SOURCES:

National Association of Scale Aeromodelers (NASA)

www.nasascale.org

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(224) 633-9090

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An old Astro Flight wattmeter connected between the ESC and the battery was used to measure the watts and amps.



The Power 60 470 Kv motor is on the left and the Power 60 400 Kv motor is on the right. Physically, they have the same dimensions, but they produce different levels of power.



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The P1B-1 Sky Voyager ARF rubber-powered airplane offers a lot of features in a small, inexpensive package. The molded-foam elliptical wing has a built-in turbulator.

VOYAGING THE SKY WITH AN ARF RUBBER MODEL

By Louis Joyner | joyner28@comcast.net

THE P1B-1 SKY VOYAGER is a simple, yet sophisticated, introductory rubber-powered model designed by Zhang Wenyi, who represented China in F1B Wakefield at a number of Free Flight (FF) World Championships. He finished in fourth place in 1985 and was a member of the first-place Chinese team in 1987 and 1989.

The Sky Voyager clearly shows its competitive roots with a folding two-blade propeller, a molded-foam wing that features an elliptical planform and dihedral, as well as a molded-in turbulator. The rubber motor is enclosed in a motor tube, and a detachable tailboom consists of a molded-plastic transition piece and a thin carbon-fiber strip running back to the rudder and stabilizer.

Although it lacks the auto surfaces of modern-day F1B Wakefields, it is set up to rig a dethermalizer or, as the translated-from-Chinese instructions call it, “a forced landing device.” I used a viscous timer mounted on the pylon with 8-pound test fishing line running back to the stabilizer’s trailing edge (TE).

The model is designed for the Chinese F1B-1 class, a small-field, rubber-power event. Rules limit rubber weight to 4 grams and the wingspan to a maximum of 649 mm (roughly 25.5 inches). The minimum flying weight is 40 grams. By comparison, the AMA P-30 event allows a maximum rubber weight of 10 grams, a maximum wingspan of 30 inches, and a minimum all-up weight of 40 grams. The reduced rubber weight limits the climb on the P1B-1, which is a good thing for small-field flying.

The Sky Voyager is available from J&H Aerospace for \$25, plus shipping.

Ribs for a Dyna-Moe

The One-Design Old-Timer Rubber model airplane for the 2020 Nats is the Dyna-Moe. Similar to its rubber-powered siblings, the Gollywock and the Jabberwock, the Dyna-Moe is a Wally Simmers design from the late 1930s. The three models have been kitted by various companies throughout the last 80 years.

The Gollywock is probably the most popular rubber-powered competition model in history, but I was always attracted to the Dyna-Moe's more elegant fuselage and retracting, single-wheel landing gear. It is easily the best looking of the three designs. Now I have a good excuse to build one for the Nats.

As I write this in early November 2019, the fuselage is framed up and all of the wing ribs are cut. I could have ordered a short kit with laser-cut ribs, but I have an overstock of good 1/16 sheet balsa and I enjoy cutting ribs.

The usual way to cut ribs is to make a rib-shaped template from 1/16 plywood, place that on a sheet of balsa, and trace around it with a sharp knife. In the 1970s, one of the model magazines featured a construction article for a Towline Glider. I didn't build the model, but I did adopt the two-piece rib template that was shown in the article.

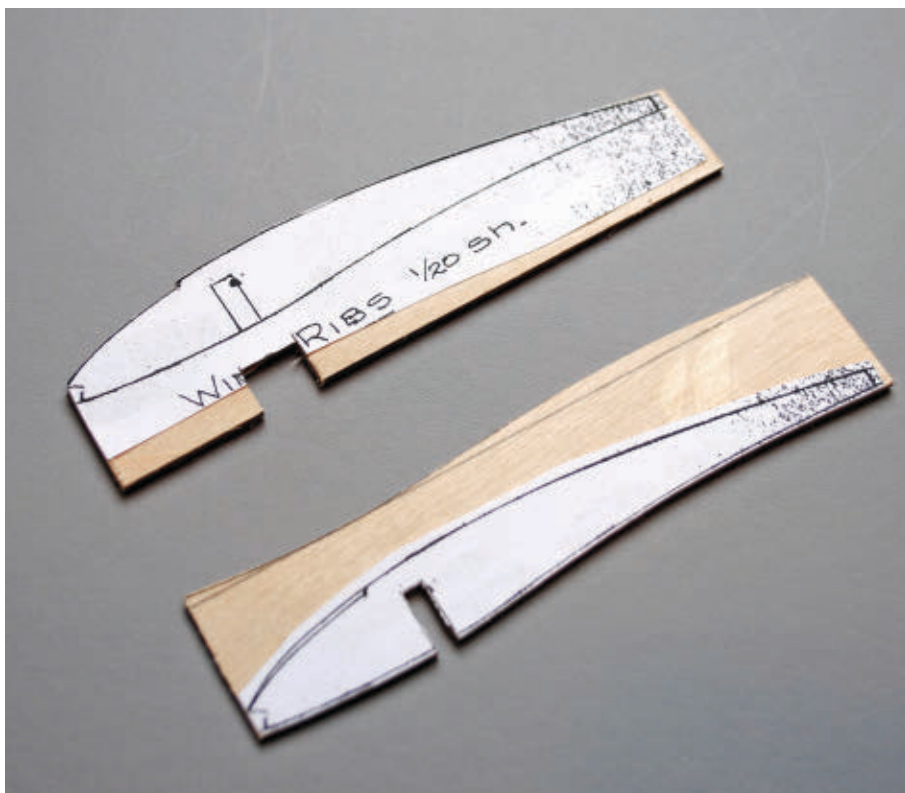
Throughout the years, after cutting hundreds of ribs, I've found the two-piece template easier to make and use than the traditional single-piece template. The lower template part guides the bottom cut then the template is repositioned to make the top cut.

This offers several advantages. Because the lower and upper curves are on separate pieces of 1/16-inch plywood, it is easy to accurately set the rib height front and back to fit the leading edge (LE) and TE thicknesses. For small ribs or thin airfoil ribs, it solves the problem of having to trace around large fingers with a sharp knife. The sheet balsa can be cut to the exact rib length, making it much easier to cut ribs in a small space than working with a 3-foot long sheet of balsa. By flipping the balsa end-for-end after each rib is cut, the ribs can be nested closer together, minimizing waste.

As the photos show, the lower part of the template follows the shape of the lower part of the rib, both top and bottom.



Removing the spinner reveals the workings of the reverse Montreal front end, which acts as a waiting stop with the motor wound and as a propeller stop at the end of the run to ensure that the blades fold under the wing.



A two-piece rib template, shown unassembled, is easier to make and use than a single rib-shaped pattern.

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With the two pieces glued together, the template is used to cut the bottom of the rib then repositioned to cut the top.



A 1/4-inch square piece of basswood wrapped with sandpaper is used with a simple jig to make a V-shaped notch in each rib for the LE.



Off-cuts from the ribs locate each rib for sanding. Two triangular strips attached to the front of the 1 x 2-inch base guide the sanding block.


The bottom edge is used to guide the knife while cutting the bottom of the rib. The top edge is used to register the bottom of the balsa sheet while the upper curve of the airfoil is being cut.

Similar to the Gollywock and Jabberwock, the wing and stabilizer of the Dyna-Moe use square balsa strips that are set on the diagonal for the LE. This requires a V-shaped notch in the front of each rib.

To make the notch, I used a piece of 1/4-inch square basswood with 150-grit sandpaper glued along two adjacent

sides. As a guide, two triangular pieces made from 1/4-inch basswood were glued to the end of a scrap piece of 1 x 2-inch pine.

Off-cuts from the ribs were glued to the 1 x 2-inch piece of pine to accurately locate the rib. A few passes with the sanding block yielded an accurate and repeatable notch.

Dyna-Moe plans, kits, and short kits are available from a number of suppliers. See the "Sources." 

SOURCES:

Retro RC LLC
(248) 212-9666
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We also want to thank Phil Tallman, AMA District XI vice president, and District XI associate vice presidents Mike Ingram and Rick Crow, for helping host the auction, as well as and Allison Haley and Erin Dobbs for helping with product donations.

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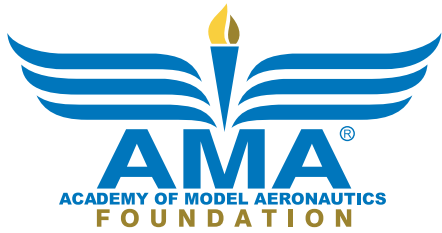
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The AMA Foundation was established in 2013 to provide the funding necessary to build and enhance AMA's benevolent programs.

If you love model aviation and want to assist the AMA with its efforts to build, enhance, and preserve the hobby, please consider a future gift of impact.



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⇒ *AMA Foundation*

FOUR ROSES FOR THE AMA FOUNDATION

By Dan Bott, AMA Foundation Board Chairman | daniel_bottsr@ml.com

The AMA Foundation had four “roses” in 2019. Through the end of November, donations rose by 39% year-to-date over the same time in 2018 and total donations exceeded all of 2018. The number of donors rose by 21% over the same period in 2018. And our social media likes and awareness rose significantly.

When I wrote this column in December, we anticipated more roses by year-end. Historically 25% of our annual donations come in during the month of December. These achievements occur with a very modest operating budget for the foundation staff to work with. Most of the funds raised each year go to support many of AMA’s worthy programs such as club field improvements, scholarships, and museum projects, along with many other nonmember-related programs. A lot of bloom for the resources consumed.

We are proud of our fellow AMA members who are dedicated and passionate about their hobby. Many clubs have offered impressive support for the AMA Foundation. Two years ago, we kick-started the Friends of the Foundation Fun Fly. Now clubs across the country hold fun-fly events and raise funds to support the AMA Foundation. A few weeks ago, one such club sent a \$500 donation from money raised in a raffle and food sales during its one-day fun-fly. The Arizona Model Pilots Society, led by club president and AMA District X associate vice president, Jim Mohan, rallied 35 club members for a fun event with a focus on supporting the AMA Foundation.

These success stories keep the board and staff committed to the mission. We have some bigger goals to meet—really large donations that have yet to be secured. To ensure the AMA Foundation’s long-term success and mission to fund AMA’s growing list of programs, we must build an endowment fund.

All successful nonprofit foundations have only met consistent growth and expansion to fund more projects by having an endowment fund that is invested to grow. A properly managed endowment fund can spin off 4% or more a year and still grow into the future. When you couple our current annual fundraising along with income from an endowment fund, the AMA Foundation has the potential to triple or even quadruple the amount it receives each year in donations.

To build an endowment, the foundation must successfully tap into larger donor bases. Some of those opportunities have been identified and we have a program in various stages


of development to nurture these opportunities. Two such initiatives are planned giving and naming rights.

Last year, our board and foundation staff spent a considerable amount of time and effort to create a naming rights portfolio of assets at the Muncie, Indiana, AMA Headquarters and International Aeromodeling Center that could potentially raise more than \$1 million in donations and grants from donors who want to put their names on notable assets such as flightlines, streets, buildings, benches, lakes, museum rooms or displays, and more.

We have completed the inventory and pricing, now we must sell the names. In 2020, we hope to market these naming rights to donors who want to support the AMA with recognition for the hobby they have enjoyed. Selling these naming rights will take marketing resources and creative talent to build a sales plan and outreach.

Our planned giving opportunity is a much larger program and has been a personal quest of mine. I believe it has the most potential to build our mandated large-endowment fund. This long-term initiative is worth the effort and will take some of the current resources to develop. It includes a planned-giving team to network with our senior members and patience to fill a pipeline of bequests.

The opportunity is apparent considering that there are 67,000 members above the age of 60 and that segment has the longest tenure of loyal membership and represents the largest percentage of existing donors to the AMA Foundation. In the coming years, a notable portion of this segment will be transferring a significant portion of their wealth and estates to charities that are important to them such as their churches, colleges, or other special-interest groups that already have a planned-giving program in place.

Planned giving will represent one of the greatest potential sources of funding an endowment portfolio. The challenge will be how to fund this effort today in order to have more roses for tomorrow. 



I

Andy Argenio

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District I

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

The following paragraph was excerpted from the website of the League of Silent Flyers (LSF) at www.silentflight.org, with the permission of Walter Adasczik, LSF president. It introduces the sailplane flying report after it that was submitted by Associate Vice President Andrew Figlar.

“A slim, graceful, long-winged craft arcs upward smoothly and steeply into the summer sky, accompanied by the faint whistle of air accelerating past its gleaming surfaces. Little sound is evident among the pilots whose gazes pierce the sky. All are alert for the subtle lift of a wing that signals a bubble of warm, rising air as the pilot curves his obedient ship upward, betraying his/her satisfaction by just a smile. Minutes, or perhaps hours later, the sailplane is electronically controlled to a perfect landing.”



Pictured (L-R) are CSF club officers Ned Bassick, Juan Cardona, John Gantor, and Roger Post Jr.

Located in the western part of Connecticut’s hill country is a unique flying club, the Connecticut Silent Flyers (CSF). Started in the 1980s, the club rents a field that has a 600-foot runway on an elevated hilltop for a specific reason and that is to fly model airplanes, which included, on the day I visited, large, towed gliders.

The club’s vice president, Martin Ludwin, said that, “While club members can fly any type of model airplane at the field, the root of the club is silent flight.” It got its name because, initially, its members flew hand-, winch-, or hi-start-launched gliders, with some having electric motors. These days they can fly models that put out more sound. In keeping that glider tradition alive, the club has switched to towing large 2- to 4-meter wingspan gliders, with two large, gas-powered towplanes.

One is Bob Waldhaus Jr.’s Pilatus PC-6 Porter, powered by a Desert Aircraft (DA) 85. The airplane has a 7-foot wingspan and weighs 29 pounds. The second is the classic Joe Bridi Big Bee. The 98-inch wingspan model was built by club member Phil Marsillio. It is powered by a DA 50 engine. It majestically tows the big gliders to altitude, under the thumbs of CSF president Roger Post Jr., where their pilots remotely release them.

Bill Manfredonia, a CSF neighbor for 24 years, said, “It’s the most creative usage of time; an environmentally safe hobby that is peaceful to watch.” CSF members agree.

Thank you, Andrew, for providing this excellent report on the CSF club. If you have never experienced the joy of sailplane flying, check out the club’s website at www.csflyers.org for sailplane events open to other clubs and AMA members. 



The CSF club members enjoy flying 2- to 4-meter gliders that are towed by large gas-powered towplanes at their flying site located in Newton CT.

District II

New Jersey, New York, Europe

AMA District II encompasses New Jersey, New York, and Europe. Domecq Smith, president of the Somerset RC club in Somerville, New Jersey, recently traveled to Europe. Domecq was kind enough to share the following report of his visit to Germany.

“This past summer, I was on vacation in Germany with my wife’s family. It’s not long when I’m visiting a place before I start looking around and noticing open areas suitable for model airplane flying. This happened during my trip and I wondered also if I might even have the chance to meet other RC modelers in the region.

“Staying in the small town of Viersen, not far from the Dutch border, my wife’s online search revealed a model airplane club nearby. I reached out to its president, Holger Schmitz, and met him where he flies with his club, called Modellflug-Club Tönisvorst. The club, in its 40th year, flies over leased property in the village of Tönisvorst. I found Holger affable, friendly, and he took time to speak with me and share some things about his club. His club is similar in size to my own with 80 members, and they enjoy a variety of disciplines from power, sailplanes, jets, and drones.



Holger Schmitz (L) with Domecq Smith.



Fliers at the Modellflug-Club Tönisvorst.

“RC flying in Germany is not unlike it is here. In spite of what we see on YouTube, most RC enthusiasts in Germany fly RC aircraft as we do in a wide range of disciplines. An exception is that electric power now makes up roughly 90% of the hobby [in Europe]. As in the US, RC fliers in Germany must carry liability insurance. At present, there is a 300-meter height limit (984 feet) for flying.

“A challenge the club has recently faced at its field is the installation of a buried, natural gas pipeline with its route going right down the middle of the club’s flying field. During my visit, sections of pipe were lying along trenches, effectively cutting the flying field in half.



LiPo battery safety is universal.

“Despite the excavations, the club continues to fly at the site. I witnessed a few attempts to get landing approaches just right so airplanes would not hit the earthen walls of the trenches. One benefit to this obstacle perhaps is that it might be making even better pilots in the club!

“What I took away from my visit was that regardless of nationality or locale, our hobby creates an almost instant understanding and rapport when meeting others who share an equal passion for our hobby.

“Although I was only there for a short visit, I felt as if I had known the gentlemen from the Tönisvorst model airplane club for years. I thank Holger Schmitz and Uwe Esser for their reception and friendship. I look forward very much to when we on this side of the Atlantic can welcome them and enjoy some flying with them here in New Jersey.”

Thanks to Domecq for his wonderful story. Please pass along your stories of clubs and camaraderie for this column.

Remember, it’s not about what you fly, it’s about the friends you make.



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District III

Ohio, Pennsylvania, West Virginia

As your AMA District III vice president (VP), I attended more than 30 events in 2019. That's a record for me! I will try to use fewer words and more pictures to catch up and showcase the modelers and the events that I attended in 2019.

On June 25, 2019, members of the AMA Executive Council, AMA's Government Relations team, and I went to Washington, D.C. The purpose of the meeting was to meet with members of the U.S. House and Senate, and officials from the FAA, AOPA, and other involved organizations to discuss the airspace restrictions imposed upon our hobby by the law passed in 2018. These meetings were a step to get our foot in the door and have face-to-face conversations with the policymakers in Washington.



As District III VP, I met with several senate and congressional representatives on Capitol Hill, advocating for the modelers of District III.

This was my first time on Capitol Hill and I must say the representatives with whom I spoke were attentive to our concerns and all asked that we reach out to them for any help needed. I assure you, AMA will utilize these contacts when necessary to help protect our valuable hobby.

On July 19, 2019, on my way to Oshkosh, Wisconsin, I stopped at the International



Todd Lee, from Cleveland, flew this beautiful P-51 in CL Stunt at the Nats. The finish is impeccable!

Terry Frazer (R), from Wheelersburg OH, took first place in RC Pylon Q-40 at the Nats. Congratulations, Terry!



Aeromodeling Center in Muncie, Indiana, to watch some of the Nats activities. I was pleasantly surprised to see several District III members competing in Control Line (CL) Aerobatics and RC Pylon.

On Saturday, I left Muncie and drove to Oshkosh for the 50th anniversary of EAA AirVenture. Hundreds of thousands of aviation enthusiasts attend Oshkosh each year, and AMA has a significant presence there.

In 2015, the EAA began to allow RC flying in the evening at Pioneer Airport, a beautiful grass aerodrome on the massive Oshkosh grounds. The evening flying has become quite popular, with more than 100 RC pilots participating each year.



Sean Elliott (R), EAA VP of Advocacy and Safety, and I had the honor of flying a demo flight with the EAA Kadet at AirVenture.

One of the 2019 highlights was EAA introducing the

Young Eagles RC airplane. EAA and AMA worked with Sig Manufacturing to produce an electric-powered version of the LT-40 trainer. The goal is for EAA chapters and AMA clubs to team up to teach EAA Young Eagles to build and fly RC models to keep them interested in aviation. A kit was assembled at Oshkosh and flown at Pioneer Airport on Saturday, July 27.

For more information, visit www.eaa.org/ea/eaa-chapters/ea/chapter-resources/chapter-programs-and-activities/EAA-Young-Eagles-Build-and-Fly-Program.

Until next month, fly safely, fly AMA.

District IV

Delaware, District of Columbia, Maryland, North Carolina, Virginia

Losing a friend can be as traumatic as losing a family member, but the memories keep them alive in our hearts. Associate Vice President (AVP) David Trogdon expounds on losing a life-long friend in model aviation.

Paul Pipkin Jr., of Troy, North Carolina, passed away in September 2019. Our fathers starting flying RC together in the early 1960s and we became fast friends. As two 12-year-olds, we were the “workers” in the club, learning to hand-launch our dads’ airplanes and climb trees for those nearly successful landings.

After my dad died in 1967, I abruptly quit flying until 1994. Needless to say, the sport had changed immensely and I realized that I had never landed an airplane with the motor running, which was the norm in the early days. I had to get Paul to teach me how to achieve that feat.

Rest in peace my friend.

David also shared this fly-in report.

Pilots gathered at the Southeastern Modelers RC Club, home of Team LowLife, near Tabor City, North Carolina, on October 5 for their last official gathering of the year. The day was nearly perfect with overcast skies, light wind, and autumn-like temperatures.

Forty-five pilots came together from several different clubs to enjoy a day of fellowship and to remember one of our most active and beloved members, Joe Ward, who recently passed away.



The Southeastern Modelers RC Club flightline.



Robbie King (L) assisting Venson Warren.

Following the opening ceremony, everyone observed a moment of silence as Joe’s airplane made a memorial flight before being retired. Joe was one of those guys who always went above and beyond and was always willing to help. He will be missed.



Above (L to R): Carmen Luciano, District I AVP Andy Figlar, and District IV AVP David Trogdon.



Above (L to R): Garland Sykes, Carmen, and Andy are admiring Garland’s 40% Cub.

The ladies in our club always go all out when preparing meals for our events, and this one did not disappoint. Pilots began to arrive on Thursday to take advantage of the new lighting system recently installed at the field for night flying. Our usual group of hobby shops donated many items for the raffle! They need our support as much as we need theirs. Buy local.

I had the opportunity to meet an AVP from District I, Andy Figlar, who was visiting a friend who had recently moved from Connecticut to Calabash, North Carolina. I told him that he should move down South and escape the cold and snow that will be settling in soon. It was interesting sharing a meal with him and learning about modeling in his area.

Go fly and have fun safely! 



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District V

Alabama, Florida, Georgia, Mississippi, Puerto Rico, South Carolina, Tennessee, US Virgin Islands

Hello everyone! It has been a wonderful experience and an honor to be your District V vice president (VP) for the last three years. I have enjoyed visiting many clubs, and I have attended quite a few events where I was able to meet some great people and see all kinds of flying. It truly was a blast, but it has come to an end.

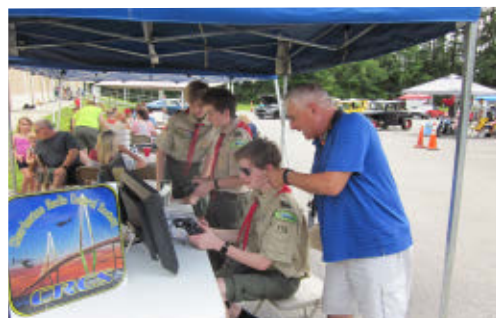
I want to thank everyone for the opportunity to represent you and the district. I appreciate your support during my term as VP, and I wish each of you well in the future.

To those of you who provided input for this column, I can't thank you enough. If you provided an article and didn't get to see it in print, I apologize, but I couldn't get to all of them. In fact, I still have a backlog of articles that I had planned to publish; I did not discard any of them.

On a positive note, I am pleased to be able to report to you that James Corry of Lynn Haven, Florida, is a recipient of the Carl and Beth Goldberg Vital People Award. Congratulations, James! Dale Riden and Phil Griffin nominated James for the award. Well done, guys!

I also want to recognize the following members for becoming contest directors: Randy Rigby of Simpsonville, South Carolina; Adam Willmon of Brownsboro, Alabama; and Alden Livingston of Columbia, South Carolina.

I received an email from Richard White of the Charleston Radio Control Society (CRCS) in Charleston, South Carolina. Richard provided information about STEM education activities in the area. It is an interesting report, and it contains more information than I have space to give it justice, but I hope Richard's summary will give you an idea of what they have been doing.



Activities at the STEM workshop!


"I have been a member of the AMA and the CRCS for four years, and recently I joined the EAA. I want to draw your attention to the efforts of the CRCS to promote STEM activities in the Charleston area.

"The club has been working with the local Coastal Carolina Council to promote STEM and the joys of aviation. I am a coordinator between the local council and the club. I work with Micah Hudson who is the official STEM coordinator with the council. We organize local STEM events with the CRCS, the National Association of Rocketry (NAR), drone racing, underwater ROVs [remote operated vehicles], and Young Eagles Flights.

"This past May, 17 youths received their first flight with the pilots in Orangeburg, South Carolina. Additionally, three earned their Aviation Merit Badges. Our fall program includes a Dream-Liner tour at Boeing in Charleston as well as a STEM/NOVA workshop for the youths to work toward the STEM/NOVA award 'Up and Away.' No local Scout has ever achieved this award, and we are proud to be able to offer guidance to 20 to 25 youths to help them obtain this award.

"Members of CRCS, NAR, drone racing, and the National Aeronautical Museum will be doing hands-on demonstrations and will be providing support."

Thank you to Richard and all involved. I wish you great success.

That is all that I have for you. Just a note: although I may no longer be your VP, I still plan to attend events and I look forward to seeing many of you along the way. I wish you clear skies, light winds, and happy flying. Stay safe and always show respect to others. I now turn you over to your new District V VP, Andrew Griffith. 



Here I am with my latest jet! (I just threw this in for fun.)

District VI

Kentucky, Illinois, Indiana, Missouri

As you are reading this, it is nearly the first of February and probably quite cold outside and maybe there's even snow on the ground. However, I am writing this the day after Thanksgiving with my belly still full of turkey and ham from yesterday.

I tell you this to set the picture for last Sunday. It was a beautiful fall day with the temperature in the 60s, and little or no wind. I must admit that after becoming vice president, I haven't made it to the flying field as much as I used to. Anyhow, I had an hour to kill, so I dropped by my local club to see what was happening.

I have been a member of this field for more 35 years. (When did I get so old?) I have seen a lot of members come and go throughout the years. Sometimes, as lives change, people come back into the club's fold again.

This day was one of those days. Mark Nuetzmann recently rejoined the club after raising his three beautiful daughters. I had not seen Mark in a few years, and we talked while he was flying his Somethin' Extra with a nice four-stroke engine on it.

I mentioned that I had not flown for a few weeks and had not brought a model to the field for my short visit. Mark landed his aircraft, refueled it, restarted it, and handed me the transmitter. He told me to have fun.

Thank you, Mark! That was a fantastic flight and it made my day!

If you have not figured it out by now, no one sent in a submission to me for the magazine this month. Therefore, I am going to punish you by sharing my own ramblings and publishing pictures of my mug!



This picture shows Richard Bahmann and me flying together at Leiper's Fork TN, in 2018.

Back to my story. On my way home, I got to thinking about all of the lifelong friendships I have created through this hobby of building

and flying model aircraft. It boggles my mind to think about the camaraderie I have had with these friends for all of these years. Then I start to think about my friends who have already passed away, some of whom were way too young. One of these friends is Richard Bahmann of Wrong Way RC.

Sometimes we allow our friends to become extra close. Randy Cameron, AMA's executive vice president, is an example of this type of relationship. Randy (on the left in the picture of us below) is like my brother—as much as my blood siblings.



By the way, it was Randy's dad, Bob Cameron, who taught me to fly more than 35 years ago, so I guess it is Bob's fault I am writing this today.


The last picture for my column this month is yours truly, once again eating chili last year at



my club's Frozen Thumb Fun Fly Event.

Let me challenge you. Send me a short report from your club's New Year's Day gathering along with a digital picture or two. We would love to see some snow flying!

Remember, to see your club in the magazine, simply send me a submission of your club's event from this past year!

I encourage you to email me at AMADistrictVI.modelaircraft.org with the word "magazine" in the subject line and attach some pictures! This is the time of year when submissions are non-existent, so get to writing! Don't forget to introduce someone to model aviation! 



VI

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District VII

Iowa, Michigan, Minnesota, Wisconsin

Let me begin by wishing everyone a belated happy New Year.

I had what we'll call an "electronic episode" that left me unable to send or receive emails for an extended period of time. Special thanks to Michigan Associate Vice President Randy Gibson for pinch-hitting for me and for a job well done.

January is typically the month when new club officers begin their terms in office. Big props to the new officers and to the outgoing officers. Extra special thanks to those who are first-time officers.

Anyone who has served knows that it can be both challenging and also an extremely rewarding experience. The bottom line is that every organization needs someone to help steer the ship. Again, thanks to all who serve.

A few other things that are worth mentioning are key deadlines to apply for AMA programs. Please take note.

- Take off And Grow (TAG): February 1, 2020
- AMA Scholarships: February 1, 2020
- Flying Site Improvement Grant: March 1, 2020



- Leader Club renewals: March 31, 2020
- AMA Model Aviation Hall of Fame nominations: March 31, 2020
- Club Charter renewals: March 31, 2020
- Carl and Beth Goldberg Vital People Award: September 15, 2020

Last, but certainly not least, regarding the New Year, a big congratulations to those who made it out on January 1 for their first flight of the year.

Pardon my grammar, but it ain't always easy to do where we live. I take my hat, coat, gloves, boots, and wool socks off to you.

Looking back at 2019, I had the opportunity to travel to Muncie, Indiana, for the annual Friends of the Foundation's Fun Fly. The event was established as a fundraiser for AMA member programs that the AMA Foundation supports.

There was plenty of fun, flying, and food. The 2020 dates have yet to be determined. Please make plans to attend and check out some of the event photos taken by Jennifer Alderman.

Take a kid flying! 



District VIII

Arkansas, Louisiana, New Mexico, Oklahoma, Texas

We honored Doug “Chief” Powell as the newest AMA Model Aviation Hall of Fame member from District VIII. Congratulations!



Associate Vice President (AVP) Clay Ricks, AVP Tony Brehens, District VIII Vice President (VP) Lawrence Harville, Chief and his wife.



A large group of pilots welcomed the AMA Model Aviation Hall of Famer at the Wichita Falls Fly-In.



Jason and Sarah Keith.



A family affair with Bonnie, little Ryker, Greg Skinner, and Teagan.



District VIII has lost one its greatest supporters. Pat Craig is seen above with her husband, Roy. Together Pat and Roy ran Roy’s Hobby Shop for 36 years. She will be missed by all.



A picture of some of the members of the San Angelo RC Club includes Jim Mohling, Mark Greer, contest director, Jimmy Fogleman, Jimmy Gaona, Charlie Campbell, club president, AMA VP Lawrence Harville, Tom Ungard, Daryl Malone, Don Baker, and Schultz the dog.

The Sparkplug of the Month is Rick Bellelo, webmaster for the Baton Rouge RC Club. Rick has been flying for 20-plus years and flies 3D, scale, and electric. He provides club maintenance, cooks, sets up the field security system, covers new membership, and is active on the club’s Facebook page. He is a tireless worker. Tell him thanks. 



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District IX

Colorado, Kansas, Nebraska, North Dakota, South Dakota, Wyoming

Meet Zac Roller, our newest associate vice president (AVP) for South Dakota. Here are a few words from him in the way of an introduction.



New South Dakota AVP Zac Roller with his youngest son and aviation enthusiast, Axton.

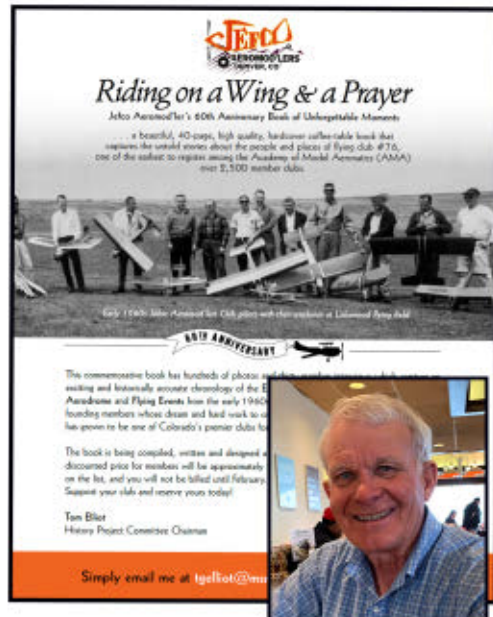
Since the 1930s, the aviation hobby has been a beloved family tradition. My grandfather flew full-scale aircraft just outside of New England, North Dakota, on the small family farm. That spurred my father's interest in aviation, including models. A close friend of his, John Brusich, owned a hobby shop in the area, which further fueled his passion for models.

As you can imagine, my love for aviation started a long time ago at my father's side. I completed my first solo RC flight when I was 6 years old. I began competing in Pattern flying in the late 1980s. Since then, I've challenged myself in International Miniature Aerobatic Club, RC Pylon Racing, and for the last several years I've found a real interest in sport scale.

I enjoy every aspect of this great hobby—from stick-building and engineering my own designs to creating trim schemes and covering models for others. My modeling time is spent on everything from a little competition at events to a few relaxing late evening flights with my family.

Mentoring young people in our model aviation community has long been an enjoyable part of what I do. Now I get a chance to pass this passion to the fourth generation of Rollers. A couple of my children are already accomplished pilots and more are in the making.

I am honored to be a part of the AMA District IX team and I hope to help promote and educate people wanting to learn more about this great hobby.



Looking for a great club project? Look no further than this enterprise from the Jefco Aeromod'lers in Denver. Here is a snippet from a recently completed book of the club's 60-year history.

This work is a historically accurate chronology of the club's members and activities starting in the 1960s. To say it was a big project is an understatement, but the result is a memento that I am sure every club member will treasure.

I credit a committee of Aeromod'lers, led by Tom Elliot (pictured), for this outstanding opus. For more information, contact tgelliott@msn.com or terryb@quattrocommunications.com.



Chris Douglas' A-26 made the rounds during last summer's flying season, including appearances at LoveAir Big Birds and Warbirds Over the Rockies. Built from Don Smith plans, the airplane has a 105-inch wingspan and two DLE 35RAs for power. Chris does a masterful job of flying it realistically.

District X

Arizona, California, Guam, Hawaii, Nevada, Utah

You know an event is a success when it has been occurring for 30 years in a row. The Bud Garric Pattern Classic is one such event. Of all of the contests in the district, this is one of the most anticipated. There are dinners held Friday and Saturday night where lots of hangar flying and live music are enjoyed. Competitors travel from the surrounding states to attend. It's just a great time for all.

If we go back to its roots, The Bud Garric Pattern Classic is a story of three friends. Bud Garric and Frank Capone met in 1977 when they were both living in South Lake Tahoe. Bud was a fireman and Frank owned a local hardware store. Together they enjoyed boating on Lake Tahoe and eventually turned to RC with Bud flying airplanes and Frank sailplanes. Their first club was off of highway 50 near Zephyr Cove.



Bud is shown in 1992 at the first National Society of Radio Controlled Aerobatics National Pan-American Championships with his YS120AC-powered SL-1.

Upon retirement, Bud moved to the Sacramento area to avoid the snow and joined the Sacramento Area Modelers (SAM). By now Bud was a Pattern flier and an expert builder, specializing in wing sheeting. He met Bob Obregon who had a passion for Pattern too. Frank would come down from Tahoe to join them and perfect their flying. Bud and Bob approached the club in 1987 about holding a Pattern contest, and in 1989 the SAM Pattern contest got its start with Bud, Frank, and Bob at the controls.

The event flourished and became very popular. Sadly, in 1996 Bud passed away. It was a shock to all who knew him. Frank and Bob decided to continue the event, renaming it The Bud Garric Pattern Classic.

I wish I would have had a chance to meet Bud. I've been flying in the event for 10 years now and I always look forward to it. Here are some photos from the 30th anniversary.



Above: Bob Obregon (L) presented Frank Capone (R) with a sign commemorating the 30th edition of The Bud Garric Pattern Classic.


Right: Dale Olstinske with his Sapphire Martini-themed Proteus.



Jon Carter loves his Final's Touch Bipe.



District X Associate Vice President Peter Vogel with his limited-edition Allure.

Until next month, I wish you all nothing but happy landings. 



X

Lawrence Tougas

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District XI

Alaska, Idaho, Montana, Oregon, Washington

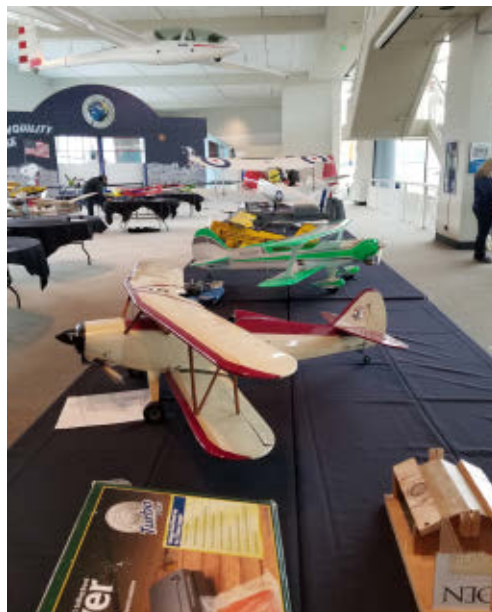
Wow, the month has flown by (no pun intended). It is the end of November as I write this. I guess I've been too busy. I did make some progress with the Der Jäger, but not as much as I wanted to. Here's a picture:



District XI Associate Vice President David Agar attended an event and made this submission:

This past weekend saw me on the road to Seattle for the Lake Sawyer Hawks' annual model aircraft display at the Museum of Flight in Seattle. I was met at the door by Steve Ashmore, the event organizer, and Randy Liny, the club president. They gave me a tour and pointed out the highlights.

There were dozens of tables full of airplanes, a movie theater with videos of the club's activities, and a simulator for the visitors to try RC flight. The local soaring group had the back wall of the room covered with sailplanes.



I was indeed impressed with the skills of the builders. There was a J-3 Cub with a fuselage built out of stainless steel tubing welded together. The downside was that all of this skillful labor had been covered over and painted so it was hard to see. I will be waiting on a flight report.

Because I had brought an airplane to put on display, I was given free entrance to the Museum



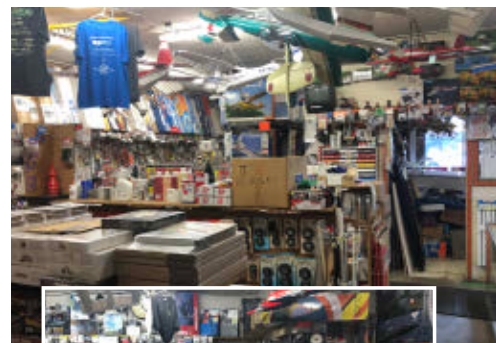
of Flight. This facility is defiantly a bucket list item. It has recently opened a Vietnam Memorial using a restored B-52.

The displays also include some RC airplanes that have been built by modelers. I had a great time and I look forward to going next year.

I want to spend some time promoting local hobby shops in our district, so I'm going to insert a bit in each article for a while. Please remember that these shops are really the front line to bringing new members to your clubs. Interested people usually go there to learn more. We need to support them and keep them going.

When I travel, I look for the shops in the area. I enjoy seeing how they support our hobby.

One of my favorites is close to me in Spokane, Washington. B&B Hobbies has been around for more than 50 years and has a huge model aircraft inventory. I can find kits and parts for any kind of modeling, from plastics to Giant Scale RC. Bryan and Bruce Batch are there to answer all your questions. If you're in Spokane, stop by.



That's all for this month. I'm headed to an indoor fly tonight and I'll report on it next month. Keep building and flying!

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- I will not operate any model aircraft while I am under the influence of alcohol or any drug that could adversely affect my ability to safely control the model.
- I will avoid flying directly over unprotected people, moving vehicles, and occupied structures.
- I will fly Free Flight (FF) and Control Line (CL) models in compliance with AMA's safety programming.
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For a complete copy of AMA's safety programming handbook, please visit: www.modelaircraft.org/files/100.pdf.

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Membership Services **Ext.**

Address changes	129
Club and chapter records	291
Leader Member applications	298
Membership records/questions	129
Missing magazines	223
Safety Code questions	230

Retail **Ext.**

AMA Plans Service.....	507
Webstore	212, 504

Insurance Matters **Ext.**

Claims, filing and status, problems, questions	253
Insurance certificates flying site/mall show	291
Legal questions and issues.....	251

Education **Ext.**

Education support/classroom materials, scholarship program, youth program ideas, TAG program, AVP training	226, 514, 517
---	---------------

Programs & Activities **Ext.**

AMA Awards.....	521
Disaster Relief Fund	200
Government Relations	227, 235, 236
Flying site support.....	230
Intro Pilot Program.....	291

Large model aircraft questions.....	230
Leader Club program.....	297
Club event handouts	291
Turbine waiver	291
AMA Foundation/charitable donations, National Model Aviation Day, Club Recognition and Reward Program	277, 279

Competition Services **Ext.**

Flying Site Assistance, rules-change cycle administration, Contest Board, AMA Competition Regulations, general technical questions, National Records	230
AMA sanctions, non-AMA sanctions, event listings, supplemental (display) ad, AMA Competition Regulations ordering, Contest Calendar, Contest Directors, Event Managers, AMA National Records.....	252
Nats/flying site usage.....	200/261
World Championships Team programs, International Sporting License, International Records, FAI competition rules and regulations	252

Media and Publications **Ext.**

Cloud 9 newsletter	500
Magazine article reprints.....	511
Magazine back issues.....	129
Model Aviation.....	225
Park Pilot.....	225
Digital publications.....	231
AMA Air.....	219
AMA podcast.....	229

Model Aviation's Frequently Used Abbreviations/Acronyms

ARF	Almost Ready to Fly
BEC	Battery Eliminator Circuit
BNF	Bind-N-Fly
CA	cyanoacrylate glue
CAD	computer-aided design
EAA	Experimental Aircraft Association
EPP	(foam) expanded polypropylene
EPO	(foam) expanded polyolefin
EPS	(foam) expanded polystyrene
ESC	electronic speed control
FAA	Federal Aviation Administration
FPV	First-Person View
LCD	Liquid Crystal Display
LED	light-emitting diode
LiFe	Lithium Iron Phosphate
LiPo	Lithium Polymer
Nats	National Aeromodeling Championships
RC	Radio Control
RTF	Ready to Fly
SIGs	Special Interest Groups
STEM	Science, Technology, Engineering, and Math
STEAM	Science, Technology, Engineering, Art and Math
sUAS	Small Unmanned Aircraft Systems
UAS	Unmanned Aircraft Systems
UAV	Unmanned Aerial Vehicle

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UNDERSTANDING LEARNING STYLES

By Kyle Jaracz, Education director | kylej@modelaircraft.org

This is the first of a two-part column defining learning styles and how you, as an educator, can incorporate your understanding of what these styles are as you teach. Next month, I'll recap the styles and move into a description of how they can best be practically utilized. Enjoy!

As we are working to develop updated training modules for our members and educators within the AMA Education department, I think it will be helpful to share some basic ideas about creating a presentation that speaks to a wide audience.

You'll want to start by tailoring the presentation to the appropriate knowledge level, but that's only a part of the answer. How you share the material has just as much to do with adequately teaching it.

What is the most effective teaching method that imparts knowledge, offers creativity, and nurtures a passion within those to whom we reach out? Spoiler: There is no one magical method that works for everyone, but that doesn't mean there isn't a solution!

Each of us has our own learning styles—our own individual ways of understanding and processing new information as it is presented to us. Although there are different methods of dividing learning styles, for me, it makes the most sense to categorize them into four groups: visual, auditory, reading/writing, and kinesthetic learners (commonly known as VARK).

Visual Learners

These learners relate to pictures, diagrams, and notes. They often write down what they are seeing in detailed notes, mentally visualize processes and procedures, and are engaged through the use of color and patterns. This group might also be identified as graphic learners, because the organization of maps, charts, graphs, flowcharts, and other symbolic visual representations of data are their preferred way to learn.

Auditory Learners

These learners often listen intently but don't engage or participate in taking notes or the presentation visuals. These learners are most engaged when discussing the topic and find storytelling to be the best demonstration of material.

If they are only given written materials, they will often read aloud to better understand the lesson. These individuals are often verbal processors, meaning they understand problems as they work through the issue verbally, with or without other participants.

Reading/Writing Learners

For this group, displaying the information in word form is preferred. These learners usually desire calm and quiet where they can read and focus on printed materials. They enjoy PowerPoint-style presentations that are text heavy, and sometimes find rewriting information as notes to be an important component to memorizing the content.

Kinesthetic Learners

Hands on! This group learns through practice and participation. They need hands-on materials and object-based examples. These learners remember what was done more than what was said. They are more apt to move around and use hand gestures when speaking.

They often skim materials and get a rough idea of the subject. Using videos, demonstrations, or simulations of real things is an effective method of imparting knowledge to this style.

Next month I'll discuss how these methods can be applied to learning situations.

See you at the flying field! 



⇒ *Flying Site Assistance*

FLYING FIELDS ARE NOT EASY TO COME BY

By Eric Williams, District II Vice President | rcpilot@nycap.rr.com

If you've been in this hobby for any length of time, you've probably realized that model flying fields are not easy to come by, and losing a model flying field is an unfortunate inevitability for many AMA clubs. Farm closures, property sales, suburban development, and, most recently, solar farms are among the most significant reasons that clubs are losing their flying sites.

Club flying sites come in many different flavors. Most sites are on public land, in parks, or owned by private individuals or companies. As a result, clubs are often at the mercy of their landlords.

One solution that is virtually permanent is the club-owned flying site. Before you think it is impossible or your club does not have the resources to do it, consider what many other clubs have done to accomplish "the impossible." Although it's true that not every club has the funds on hand to purchase a flying site, many clubs have done just that through creative means.

Realistically, there are four methods for clubs to purchase property. Clubs can use funds from their treasury; secure a loan from a bank or lender; ask a seller to hold a note; or utilize a club-shares purchase plan available to club members. The latter is the most common method and has worked for many AMA clubs.

A club-shares field-purchase plan is a good option because it provides for greater latitude in how a club structures its financing. In essence, club members share as the financiers of their flying site.


A club-shares field purchase plan is relatively easy to structure. The club makes shares available for purchase to club members. The club determines a share price. Club members purchase the number of shares they choose. For some members, that might be one share; for others it could be many shares. Through the sale of shares, the club can accumulate the funds needed for its field purchase, or perhaps combine a club-shares plan with other means of financing.

As part of the club-shares structure, club members are paid back over time for

their shares via club events and other fundraising activities. If a club member should pass on, a priority is given to pay back his or her estate before other club members. Club members can also sell their shares to other club members if they choose to. An added benefit of a club-shares plan is that members are truly "invested" in their club.

As with any flying site, clubs should consider the proximity of their flying fields to neighbors, schools, roads, or any activity or structure that could be in conflict with model aircraft. Be certain to seek the advice of an attorney in structuring a club-shares purchase plan or any significant contract into which your club enters. Also discuss your proposed flying site with local zoning officials and be certain that your site will not violate zoning rules or public ordinances.

As the cost of real estate rises, many club-shares flying sites are now worth many times their original purchase price—a nice problem to have. Clubs utilizing the club-shares method can also consider applying for AMA Flying Site Assistance Grants to help offset their site development costs.

Although the club-shares method might not be for everyone, it definitely has worked for clubs that now have better control over their futures and a more permanent flying site. 

SANCTIONED EVENT CALENDAR

FLYING

February

ARIZONA

02/7/2020 - 02/9/2020 - Mesa, AZ (C) 16TH ANNUAL ARIZONA ELECTRIC FESTIVAL. Site: Superstition Airpark. Mr Shannon L Gallagher CD/EM PH: (602)510-3074. Email: greenlion69@yahoo.com. Visit: azelectricfestival.com. Sponsor: ARIZONA MODEL AVIATORS.

02/22/2020 - 02/23/2020 - Florence, AZ (AA) WINTER ROUND UP AT FELIX RANCH. Site: 7663 E Hunt Hwy. Mr Joseph A MacGregor CD/EM PH: (805)441-3633. Email: joemac5595@cox.net. Visit: slrcc.org. Sponsor: SUN LAKES MODEL AIRPLANE CLUB (SLRCC).

02/22/2020 - Yuma, AZ (C) YUMA AIRSHOW. Site: Rifle Range Rd. Mr Tanner S Curtis CD/EM PH: 619-947-9041. Email: xpresscs@yahoo.com. Sponsor: YUMA AEROMODELERS.

02/29/2020 - 03/1/2020 - Apache Junction, AZ (AAA) 7TH ANNUAL DESERT PATTERN CHALLENGE. Site: N Ironwood Rd Superstition Field. Mr John L Bentley CD/EM PH: (480)349-0303. Email: j.bentley@usa.net. Visit: www.eastvalleyaviators.org. Sponsor: EAST VALLEY AVIATORS INC.

CALIFORNIA

02/7/2020 - 02/11/2020 - Lost Hills, CA (AAA) ISACCCSON WINTER CLASSIC & KIWI WORLD CUP. Site: Lost Hills Model Airfield. Mr Roger M Morrell CD/EM PH: (310)483-8779. Email: r_morrell@yahoo.com. Visit: sen.faireeflight.org.

02/10/2020 - 02/24/2020 - Thermal, CA (C) COACHELLA JET JAM. Site: Canal Regional Park. Mr Daniel R Metz CD/EM PH: (760)831-6045. Email: jetmandan43@yahoo.com. Visit: www.cvrclub.com. Sponsor: COACHELLA VALLEY RC CLUB.

02/13/2020 - 02/17/2020 - Lost Hills, CA (AA) BOB WHITE MEMORIAL MAX MEN INTERNATIONAL. Site: Lost Hills Model Airfield. Mr William M Booth CD/EM PH:

(760)889-3201. Email: fftlarch@gmail.com. Sponsor: MAX MEN.

02/14/2020 - 02/17/2020 - San Diego, CA (C) CHILI AT CHOLLAS. Site: 5997 College Grove Dr. Austin Heilman CD/EM PH: (619)890-9423. Email: austinheilman@gmail.com. Visit: www.chollasrcflyers.com. Sponsor: CHOLLAS RC FLYERS.

02/20/2020 - 02/23/2020 - Livermore, CA (BRST) MARSHALL RANCH HELI FUN FLY. Site: 8638 Patterson Pass Rd. Mr Jim Thompson CD/EM PH: (978)590-0340. Email: jctpro@hotmail.com. Sponsor: LIVERMORE FLYING ELECTRONICS.

FLORIDA

02/6/2020 - 02/9/2020 - Mulberry, FL (C) FLORIDA EJET FEST INTERNATIONAL. Site: 4288 Florida 60. Mr Gerald P McGhee CD/EM PH: (757)645-8555. Email: mcghee66@gmail.com. Visit: imperialrcclub.com. Sponsor: IMPERIAL RC CLUB INC.

02/8/2020 - 02/9/2020 - Lake Placid, FL (AA) LAKE PLACID 2020 PATTERN WINTER/SUN OPENER. Site: Placid Lakes Boulevard Riley Field. Mr Larry L Kauffman CD/EM PH: (863)659-1460. Email: lkauffma@aol.com. Visit: www.lpa.club. Sponsor: LAKE PLACID AEROMODELERS.

02/8/2020 - Deland, FL (C) DELAND GOLDEN HAWKS WINTER AIR-FEST. Site: 1000 R/C Club Rd. Mr Michael Setteducati CD/EM PH: (845)596-0924. Email: byronboy1954@gmail.com. Visit: www.delandgoldenhawks.com. Sponsor: DELAND RC CLUB.

**Deland Golden Hawks
Winter RC
Air Fest**
Saturday, February 8th, 2020

All aircraft types are welcome
Sorry, No Turbines, Noon Demos
Swap Meet-your Table
Pilot Awards and no fees
Meeting at 9am
Entrance- \$5 Donation
Great Fun, Great Food all day

Coordinator: Mike Setteducati
845-596-0924
www.delandrcclub.com

02/11/2020 - 02/12/2020 - Palm Bay, FL (AMA) FMA FEBRUARY RECORD TRIALS. Site: Sopadilla Rd. Mr Duncan McBride CD/EM PH: (239)437-0065. Email: n319dm@gmail.com. Sponsor: FLORIDA MODELERS ASSOCIATION.

02/15/2020 - Polk City, FL (C) FUN FLY AND SWAP MEET. Site: 2375 Barfield Rd Mr James R Mahoney CD/EM PH: (863)712-6790. Email: jrmahoney36@aol.com. Visit: mid-florida r/c club.com. Sponsor: MID-FLORIDA R/C CLUB, INC.

02/22/2020 - 02/23/2020 - Miami, FL (A) AMPS IMAC CHALLENGE. Site: Silver Field. Mr Vicar F Hernandez CD/EM PH: (305)505-7607. Email: vicarh@bellsouth.net. Visit: www.amps-rc.org www.fb.com/amps.imac. Sponsor: AERO MODELERS OF PERRINE INC.

02/22/2020 - Ocala, FL (C) OCALA ELECTRIC FLY IN. Site: OFMC Field 110th St. Mr Gary R Doeren CD/EM PH: 920-737-4852. Email: grdoeren@aol.com. Visit: ocalaflyingmodelclub.com. Sponsor: OCALA FLYING MODEL CLUB.

GEORGIA

02/15/2020 - Dunwoody, GA (A) FEBRUARY INDOOR. Site: 1978 Mt Vernon Rd Saint Luke's Presbyterian Church. Mr Dohrman G Crawford CD/EM PH: (770)698-8737. Email: tum25@bellsouth.net. Visit: www.thermalthumbers.com. Sponsor: THERMAL THUMBERS OF METRO ATLANTA.

MASSACHUSETTS

02/9/2020 - Georgetown, MA (A) STEALTH SQUADRON FAC 49, 2ND WINTER INDOOR CONTEST. Site: 68 Elm Street Penn Brook School. Mr Stephen Evans CD/EM PH: twigsandtissue@gmail.com. Visit: www.stealthsquadron-fac49.com. Sponsor: MERRIMACK VALLEY AIR-ISTOCRATS.

MISSOURI

02/23/2020 - Fenton, MO (AAA) ICE-O-LATED CL STUNT & SPEED. Site: 215 Valley Park Rd Buder Park. Mr Frederick S Cronenwett CD/EM PH: (316)680-1515. Email: clscale7@gmail.com. Visit: <https://lafayetteesquadrilla.wordpress.com>. Sponsor: LAFAYETTE ESQUADRILLE.

NORTH CAROLINA

02/7/2020 - 02/9/2020 - Knightdale, NC (C) CHILLOUT 2020. Site: 604 Three Sisters Rd. Mr Jay Treadway CD/EM PH: (919)667-8429. Email: jayjtechserv@gmail.com. Visit: www.rchelisonly.com. Sponsor: RC Helis Only (RCHO).

NORTH DAKOTA

02/8/2020 - Grand Forks, ND (C) THE INTERNATIONAL INDOOR FUN FLY. Site: 2419 2nd Ave N University of North Dakota Athletics High Performance Center. Mr Brian D Dorff CD/EM PH: (701) 317-6816. Email: bluebaronbrian@gmail.com. Visit: www.redriverflyers.com. Sponsor: RED RIVER RC FLYERS.

OHIO

02/23/2020 - Wapakoneta, OH (C) LIMA AREA RADIO KONTROL SOCIETY 12TH ANNUAL ELECTRIC INDOOR FLY. Site: Wapakoneta High School. Mr Rodney C Metz CD/EM PH: (567)356-7453. Email: dts@bright.net. Sponsor: LARKS.

**LIMA AREA RADIO KONTROL SOCIETY
LARKS 13th ANNUAL
ELECTRIC INDOOR FLY
FEBRUARY 23, 2020**

REGISTRATION: 9:00 A.M.
Flying 9:30 A.M. - 2:00 P.M.

Registration Donation Fee: \$10.00 FLY
LOCATION: WAPAKONETA HIGH SCHOOL 1 W. Redskin Trail
Large Gynasium to fly in

Must be an AMA member to Fly
ADMISSION: \$3.00 (children under 12 free with adult)

INFO: GARY WILLIAMS 419-516-3189 or
ROD METZ C/O Duff's Toy Shop 419-736-2087

OREGON

02/15/2020 - 02/16/2020 - Tillamook, OR (AMA) TILLAMOOK AIR MUSEUM TIME TRIAL. Site: 6030 Hangar Rd Tillamook Air Museum. Mr Jake A Palmer CD/EM PH: (360)545-3113. Email: 82.jake@gmail.com.

WISCONSIN

02/21/2020 - 02/23/2020 - Oshkosh, WI (AA) EAA FAMILY FLIGHT FEST. Site: 3000 Pobereznay Rd EAA Aviation Center. Mr Jeffrey R Annis CD/EM PH: (262)5420105. Email: jeannis@aol.com. Visit: www.bongeagles.org. Sponsor: BONG EAGLES.

March

ALABAMA

03/20/2020 - 03/22/2020 - Bessemer,

AL (C) BIRMINGHAM 2020 - THE DITCH.
Site: 7477 Dickey Springs Rd. Mr Jacob T
Crowder CD/EM PH: (205)514-5469. Email:
jtcrowder@crimson.ua.edu. Visit: www.
facebook.com/birmingham-rc-helicopter-
club-1889978454548087. Sponsor:
BIRMINGHAM HELICOPTER MODELERS.

ARIZONA

03/6/2020 - 03/8/2020 - Tucson, AZ (AA)
TUCSON IMAC. Site: Club Field. Mr Kevin
Garland CD/EM PH: (770)715-6263. Email:
garlandk89@gmail.com. Visit: www.
tucsonradiocontrolclub.com. Sponsor:
TUCSON RADIO CONTROL CLUB INC.

03/10/2020 - 03/14/2020 - Tucson, AZ (C)
VINTAGE STUNT CHAMPIONSHIPS XXXII.
Site: 4600 N Silverbell Rd Christopher
Columbus Park. Mr James Hoffman CD/EM
PH: 480-329-3316. Email: windswept4@
cox.net. Visit: azucontrol.org. Sponsor:
CHOLLA CHOPPERS MAC and CENTRAL
ARIZONA CL CLUB.

03/13/2020 - 03/15/2020 - Mesa, AZ (C)
GUNSMOKE 2020. Site: Superstition Air
Park. Mr Paul J Goldsmith CD/EM PH:
602-323-7753. Email: pt19nut@aol.com.
Sponsor: ONE EIGHTH AIR FORCE.

03/20/2020 - 03/22/2020 - Tucson, AZ
(AA) TOP GUN F2D. Site: 4600 N Silverbell
Rd Christopher Columbus Park. Mr Steve O
Stewart CD/EM PH: (520) 220-9322. Email:
clcombat@yahoo.com. Sponsor: CHOLLA
CHOPPERS MAC.

03/21/2020 - 03/22/2020 - Apache
Junction, AZ (C) CACTUS CLASSIC. Site: N
Ironwood Rd Superstition Field. Mr Randall
W Wegner CD/EM PH: 520-954-0021.
Email: thesuperweg@aol.com. Visit: www.
eastvalleyaviators.org. Sponsor: EAST
VALLEY AVIATORS INC.

03/27/2020 - 03/29/2020 - Mesa, AZ (C)
WINGS OVER ARIZONA. Site: Levee Dr
Superstition Airpark. Mr Noel Hunt CD/
EM PH: (586)747-3001. Email: rcstrutter@
gmail.com. Visit: http://azmodelaviators.
com. Sponsor: ARIZONA MODEL AVIATORS.

03/28/2020 - 03/29/2020 - Tucson, AZ
(C) WATTS UPELECTRIC FLY-IN. Site:

Tucson Radio Control Club. Mr Kevin
Garland CD/EM PH: (770)715-6263. Email:
garlandk89@gmail.com. Visit: www.
tucsonradiocontrolclub.com. Sponsor:
TUCSON RADIO CONTROL CLUB INC.

FLORIDA

03/11/2020 - 03/14/2020 - Lakeland, FL
(C) FLORIDA JETS. Site: 4999 Air Show Rd
Paradise Field. Mr Frank Tiano CD/EM PH:
(863)607-6611. Email: frank@franktiano.
com. Visit: franktiano.com. Sponsor:
IMPERIAL RC CLUB INC.

03/13/2020 - 03/15/2020 - Palmetto, FL
(C) 29TH ANNUAL DICK COLE MEMORIAL
FLY IN. Site: Carl Wegner Field. James L
Holloman CD/EM PH: (941)224-7009. Email:
jhhollo6540@aol.com. Visit: manateerc.
com. Sponsor: MANATEE COUNTY RADIO
CNTRLRS.

03/14/2020 - 03/15/2020 - Elkton, FL (C)
FLORIDA SOARING SOCIETY #4&5 ALES
Sponsored By SARCF. Site: 3005 Alan Nease
Rd St Johns County Solid Waste. Mr Thomas
J Boyd CD/EM PH: (904)814-5672. Email:
tb139harbor@gmail.com. Sponsor: SAINT
AUGUSTINE RC FLYERS.

03/21/2020 - 03/22/2020 - Ocala, FL (AA)
2020 OCALA FLYING MODEL CLUB IMAC
CONTEST. Site: 1020 SE 110th St OFMC Field.
Mr Edward J Baker CD/EM PH: (207)318-
3524. Email: ejbaker14@gmail.com. Visit:
ocalaflyingmodelclub.com. Sponsor: OCALA
FLYING MODEL CLUB.

03/21/2020 - 03/22/2020 - Cape Coral,
FL (C) GATHER OF THE GIANTS. Site: 1030
NW 28th St Seahawks Air Park. Mr Randy
L Butz CD/EM PH: 239-223-3994. Email:
randybutz@embarqmail.com. Visit:
rseahawks.org. Sponsor: CAPE CORAL R/
SEA HAWKS.

03/28/2020 - 03/29/2020 - Nokomis, FL
(C) 21ST ANNUAL WINGS OVER VENICE.
Site: 4000 Knights Trail Rd Memorial Field.
Mr Jim Hullhorst CD/EM PH: 941.441.6379.
Email: oldreflier@aol.com. Sponsor: R/C
FLIERS OF VENICE INC.

GEORGIA

03/28/2020 - Dunwoody, GA (A) MARCH

INDOOR. Site: 1978 Mt Vernon Rd Saint
Luke's Presbyterian Church. Mr James
A Altenbern CD/EM PH: 864-398-0303.
Email: jaltenbern0705@charter.net. Visit:
thermalthumbs.com. Sponsor: THERMAL
THUMBERS OF METRO ATLANTA.

INDIANA

03/28/2020 - 03/29/2020 - W Baden Sprgs,
IN (A) 2020 JIM RICHMOND OPEN. Site:
8538 W Baden Ave West Baden Springs
Hotel. Mr Reynold A Mazzocco CD/EM PH:
(812)455-0838. Email: aprivipilot@aol.com.
Sponsor: BONG EAGLES.

LOUISIANA

03/20/2020 - 03/21/2020 - Rayne, LA
(C) CAJUN FELI FEST. Site: Don Habetz
Memorial Field. Mr Jon R Martin CD/EM PH:
(337)783-2759. Email: marfly3@bellsouth.
net. Visit: www.ramsrflyers.com. Sponsor:
RICE AREA MODELERS SOCIETY.

NEW YORK

03/14/2020 - Syracuse, NY (C) MODEL
AIRCRAFT FORUM & INDOOR FLY IN. Site:
Syracuse Academy of Science. Mr Herbert
C Ziegler CD/EM PH: (315)857-6266. Email:
herbz1957@yahoo.com. Visit: arcsnews.
com. Sponsor: AERO RADIO CLUB OF
SYRACUSE.

NORTH CAROLINA

03/19/2020 - 03/21/2020 - Spencer, NC
(DEMO) WIND AND WINGS THE SCIENCE
OF FLIGHT. Site: 411S Salisbury Ave NC
Transportation Museum. Mr Michael F
Goodman CD/EM PH: (704)982-0537. Email:
mfgoodman@ctc.net. Visit: nctrans.org/
events/wings.aspx. Sponsor: CABARRUS RC
FLIERS and CENTRAL ARIZONA CL CLUB.

03/28/2020 - Wade, NC (C) PIEDMONT
AEROMODELERS AMA FUN FLY AND
SWAP MEET. Site: 2900 Hayfield Rd.
Kent Porter CD/EM PH: (919)538-6811.
Email: kent@porterscales.com. Visit:
piedmontaeromodelers.club. Sponsor:
PIEDMONT AEROMODELERS.

SOUTH CAROLINA

03/27/2020 - 03/28/2020 - Bowman, SC (C)
BOWMAN RC FLYERS SPRING FLING. Site:
1422 Landsdowne Rd. Mr Gary L Jones CD/
EM PH: (843)701-2644. Email: viper1gj@

gmail.com. Visit: bowman rc flyers on
facebook. Sponsor: Bowman RC Flyers.

TEXAS

03/27/2020 - 03/29/2020 - Monaville, TX
(C) HOUSTON JET RALLY. Site: Bomber
Field. Mr Woody B Lee CD/EM PH: (832)794-
3370. Email: woody.lee123@gmail.com.
Visit: bomberfieldusa.com. Sponsor:
BOMBER FIELD USA.

03/28/2020 - Grand Prairie, TX (C) JETS
OVER DFW EDF ELECTRICS FUNFLY,
TAILGATE SWAPMEET GTRCC. Site: Jim
Fulton Field Low Branch Park. Mr Gary L
Pannell CD/EM PH: (817)682-5277. Email:
garpannell@gmail.com. Visit: gtrcc.org.
Sponsor: GOLDEN TRIANGLE RC CLUB.

UTAH

03/6/2020 - 03/7/2020 - St George, UT (C)
42ND ANNUAL PRESIDENTS DAY FLY-IN.
Site: Remote Possibilities RC Club Field. Mr
Joe M Kirton III CD/EM PH: (435)215-8240.
Email: kirton.joe@gmail.com. Visit: www.
remoterc.com.

NONFLYING

February

ARKANSAS

02/1/2020 - El Dorado, AR (E) MASA 20TH
ANNUAL SWAP SMEET. Site: 1000 N Mosby
Ave. Mr Jason W Cunningham CD/EM PH:
(870)226-6509. Email: jcunningham50@
hotmail.com. Sponsor: MODEL AVIATORS OF
SARKANSAS.

FLORIDA

*The Palm Beach
Radio Control Association*

SWAP MEET

Sunday, Feb. 09, 2020

Doors Open at 9:00 a.m.

Admission \$3.00

**Tables \$10.00 in advance,
\$15.00 at the door!**

South County Civic Center

16700 Jog Road

Delray Beach, FL 33446

Contact: Jerry Rodman

jerry.rodman2@gmail.com

SANCTIONED EVENT CALENDAR

02/9/2020 - Delray Beach, FL (E) SWAP MEET. Site: 16700 S Jog Rd South County Civic Center. Mr Jerome Rodman CD/EM PH: (561)706-1135. Email: jerry.rodman2@gmail.com. Sponsor: PALM BEACH R/C ASSOCIATION.

02/16/2020 - Sunrise, FL (E) SWAP MEET. Site: 16001 W State Rd 84 Markham Park Airfield. Mrs Cheri Storer CD/EM PH: (954)816-4410. Email: mpppilots@gmail.com. Visit: mpppilots.com. Sponsor: MARKHAM PARK PILOTS ASSOCIATION.

02/22/2020 - Ocala, FL (E) TAILGATE SWAP. Site: 1020 SE 110th St. Mr Edward Wingerter CD/EM PH: (352)351-0357. Email: skyhawk60s@msn.com. Visit: ocalafllyingmodelclub.com. Sponsor: OCALA FLYING MODEL CLUB.

GEORGIA

02/28/2020 - 02/29/2020 - Perry, GA (E) SOUTHEASTERN MODEL SHOW. Site: 401 Golden Isles Pkwy Georgia National Fairgrounds & Agricenter. Mr James C Parker Jr. CD/EM PH: (478)396-8731. Email: sms@gamarc.com. Visit: www.gamarc.com/2020sms.html. Sponsor: GA AIRCRAFT MODELERS ASSN.

ILLINOIS

02/15/2020 - St Charles, IL (E) 15TH ANNUAL SWAP MEET. Site: 525 S Randall Rd Kane County Fairgrounds. Mr John M Turner CD/EM PH: (630)215-6110. Email: jtgrassroots@yahoo.com. Visit: foxvalleyaero.com. Sponsor: FOX VALLEY AERO CLUB.

Fox Valley Aero Club
15th Annual SWAP MEET

Kane County Fairgrounds
525 Randall Rd, St. Charles, IL
February 15th, 2020

Table set up 8:00 am.
Doors open 9:00 - 1:00 pm.
Indoor Foamy Fly 1:00 - 4:00 pm.

Table Rental
1 table: \$23, 2 or more tables: \$21 each
After 2/1/2020 all tables: \$25
\$5 per person entry, kids under 12 free

Food & Beverages available
Check payable to Fox Valley Aero Club,
PO Box 837, St Charles, IL 60174
John Turner Ph: 630 443 7807
email: jtgrassroots@yahoo.com
For details go to: foxvalleyaero.com

INDIANA

02/29/2020 - Bloomington, IN (E) MONROE COUNTY RC CLUB SWAP MEET. Site: 5700 W Airport Rd Monroe Co Fairgrounds. Mr Timothy A Mellott CD/EM PH: (812)829-8821. Email: warbird142@gmail.com. Visit: monroecountyrclub.org. Sponsor: MONROE COUNTY RC CLUB.

IOWA

02/1/2020 - Coralville, IA (E) SWAP MEET. Site: 300 E 9th St Coralville Marriott Hotel & Conference Center. Mr Lance J Meyer CD/EM PH: (563)529-1581. Email: lmeyer2@msn.com. Visit: iowacityaerohawks.com. Sponsor: IOWA CITY AEROHAWKS INC.

Coralville Convention Center
Iowa City Aerohawk

Swap Meet
17th Annual

February 1st, 2020
SATURDAY

\$6 Admission Email: lmeyer2@msn.com
Kids 12 & Under FREE! or call @ 563.529.1581

\$15 for 8 Foot Table w/chair
(Includes 1 Admission)
Additional Tables \$12

VIP Spots: Contact Lance
Setup @ 8AM / Doors Open @ 9
Flyer & Map at:
iowacityaerohawks.com

30000 SQ/Ft Venu

1-80 to Exit 242, East on 9th,
Right on Quarry Road to the
Coralville Convention Center

KANSAS

02/8/2020 - Wichita, KS (E) 59TH AIR CAPITAL R/C & MODEL AUCTION. Site: 2744 S George Washington Blvd Cessna Activity Center. Mr William F Roberts II CD/EM PH: (316)258-1858. Email: info@aircapitalauction.com. Visit: aircapitalauction.com. Sponsor: DERBY RADIO CONTROL CLUB and WICHITA RADIO CONTROL CLUB.

AIR CAPITAL
R/C & MODEL AUCTION



59th ANNUAL
Formerly the Wichita R/C Club Auction

February 8, 2020 - 9 AM start
Check-in Feb 7th at 4-10pm and 8th 7am

Cessna Activity Center
2744 George Washington Blvd., Wichita, KS
Concessions on site.

Contact Bill Roberts: 316-258-1858
or Ken Chadwick: 316-440-5945
info@aircapitalauction.com

WWW.AIRCAPITALAUCTION.COM

MARYLAND

02/8/2020 - Westminster, MD (E) ANNUAL FLEA MARKET. Site: 519 Poole Rd VFW Post #467. Mr Steven J Rothschild CD/EM PH: (410)493-8490. Email: steven_rothschild@premierinc.com. Visit: flywam.org. Sponsor: WESTMINSTER AERO MODELERS INC.

MASSACHUSETTS

02/9/2020 - Burlington, MA (E) AUCTION. Site: 162 Winn St American Legion Post 273. Mr Thomas A Dentrement CD/EM PH: (781)231-2198. Email: tom.dentrement@comcast.net. Visit: 107thrc.com. Sponsor: 107TH R/C FLYERS INC.

MICHIGAN

02/1/2020 - Whitmore Lake, MI (E) SUPER SWAP 2020. Site: 1077 Barker Rd Whitmore Lake Elementary. Mr Thomas L Blaszk CD/EM PH: (313)585-3351. Visit: hamburgflyers.org. Sponsor: HAMBURG FLYERS R/C CLUB INC.

02/9/2020 - New Lothrop, MI (E) RC SWAP MEET. Site: New Lothrop Elementary School. Mr James A Breidenstein CD/EM PH: 810-247-7793. Email: chope1@centurytel.net. Visit: https://chesaningmodelflyi.wixsite.com/chesaningrcclub. Sponsor: CHESANING AREA MODEL FLYING CLUB INC.

RC SWAP MEET
Chesaning Area Model
Flying Club
Sunday, February 9, 2020
9 AM to 2 PM
New Lothrop Elementary
School
9387 Genesee St.
New Lothrop, MI 48460
Tables: \$20; Admission: \$5
Marshal! 810-348-6390
marshal-
emmendorfer@hotmail.com

MISSOURI

02/1/2020 - Lees Summit, MO (E) KCRC SWAP N SHOP. Site: 520 NW Murray Rd The Pavilion at John Knox Village. Mr Duane R Hulén CD/EM PH: (816)516-4526. Email: drhulen@sbcglobal.net. Visit: kcradiocontrol.com. Sponsor: KANSAS CITY RC ASSN.

NEW JERSEY

02/1/2020 - Hillsborough Township, NJ (E) ATOMS RC SWAP MEET. Site: 379 S Branch Rd Hillsborough Library. Mr Barry S Wilbur CD/EM PH: (908)526-7361. Email: bwilbur1@optonline.net. Visit: atomsrcers.net. Sponsor: ATOMS RCERS.

Annual Swap Meet
FEB 1, 2020
ATOMS RCERS

8AM setup/Public 9AM to 3PM
70 Tables Available
Hillsborough Municipal Complex
Hillsborough, NJ 08844
Wider Aisles / Free Parking
FOOD/BEVERAGES
\$10 per table - \$5 admission
MAJOR VENDORS!
Barry Wilbur (908) 526-7361
bwilbur1@optonline.net
*Event will be held regardless of weather
Check Web Site for important Details
www.atomsrcers.net

OHIO

02/1/2020 - Newark, OH (E) LCRC ANNUAL SWAP SHOP & AUCTION. Site: 469 Forry St VFW Post 1060. Mr Robert L Grashel CD/EM PH: (740)587-1854. Email: bobandjeanetteg@hotmail.com. Visit: lcrccohio.com. Sponsor: LICKING COUNTY RADIO CONTROL CLUB.

02/8/2020 - Dayton, OH (E) DAYTON MODEL RAMA. Site: 645 Infirmiry Rd Montgomery County Fairgrounds. Mr Paul Stimml CD/EM PH: (877)676-3841 X103. Email: daytonmodelrama@gmail.com. Visit: wingmasters.org. Sponsor: DAYTON WINGMASTERS.

DAYTON
MODEL RAMA

Swap & Auction
9AM Sat., Feb 8th, 2020
Montgomery County Fairgrounds
645 Infirmiry Rd, Dayton, OH 45417

200+ Tables sell out every year!
Raffle @ 50/50 - Auction after noon
See AMA calendar or website for info.
Call #1-877-676-3841 x103
www.Wingmasters.org

02/15/2020 - Wooster, OH (E) MULTI CLUB SWAP MEET. Site: 4599 Burbank Rd Grace Church. Mr Robert E Draman CD/EM PH: (234)804-6764. Email: oldtownvalley@outlook.com. Visit: sites.google.com/site/waynecountyrclub. Sponsor: WAYNE COUNTY RC CLUB.

**LIMA AREA RADIO KONTROL SOCIETY
LARKS 13th ANNUAL
SWAP Shop
FEBRUARY 23, 2020**

REGISTRATION: 8:00 A.M. For Vendors
Doors open to the public 9:00 a.m. - 2:00 P.M.
Registration Donation Fee: \$10.00 SWAP TABLE (Photoprint)
\$12.00 (Day of Event)
Registration Fee includes \$3.00 admission fee
LOCATION: WAPAKONETA HIGH SCHOOL 1 W. Redskin Trail
Reserve Early Limited Space.
ADMISSION: \$3.00 (children under 12 free with adult)
INFO: GARY WILLIAMS 419-618-3188 or
ROD METZ, C/O Darts Toy Shop 419-738-2007

02/23/2020 - Wapakoneta, OH (E) LIMA AREA RADIO KONTROL SOCIETY 12TH ANNUAL SWAP SHOP. Site: 1 Redskin Trl Wapakoneta High School. Mr Rodney C Metz CD/EM PH: (419)738-2007. Email: dts@bright.net. Sponsor: LARKS.

TEXAS

02/28/2020 - 02/29/2020 - Garden Ridge, TX (E) TRI CITY FLYERS 2020 ANNUAL SWAP MEET. Site: 9400 Municipal Pkwy Jay F. Feibelman Garden Ridge Community Center. Mr Frank L George CD/EM PH: (805)478-3037. Email: tvrcm@att.net. Visit: tricityflyers.com. Sponsor: TRI CITY FLYERS INC.

VIRGINIA

02/15/2020 - Newport News, VA (E) NEWPORT NEWS PARK RADIO CONTROL CLUB SWAP MEET. Site: Immanuel Baptist Church. Mr Bruce E Thompson CD/EM PH: (757)599-6811. Email: bethomp@verizon.net. Visit: www.newportnewsrcc.org. Sponsor: NEWPORT NEWS PARK R.C.

02/22/2020 - Weyers Cave, VA (E) VALLEY RC FLYING CLUB ANNUAL SWAP MEET. Site: Weyers Cave Community Center. Mr Kevin P Grapes CD/EM PH: (540)533-2446. Email: k.grapes41@gmail.com. Visit: vrcfc.org. Sponsor: VALLEY RC FLYING CLUB.

March

ALABAMA

03/21/2020 - Decatur, AL (E) NORTH ALABAMA SPRING SWAP MEET. Site: 1117 Lenwood Rd SE Decatur Shrine Club. Mr James R Ray CD/EM PH: (256)353-1323. Email: james_r_ray@att.net. Visit: ourdmac.com. Sponsor: DECATUR MODEL AIRPLANE CLUB.

CONNECTICUT

03/22/2020 - Wallingford, CT (E) 6TH ANNUAL R/C SWAP MEET. Site: 1074 S Colony Rd. Zandri's Stillwood Inn. Mr Dennis J Keegan CD/EM PH: (860)322-2102. Email: ecsf.swap@gmail.com. Visit: swampflyers.net. Sponsor: EASTCOAST SWAMP FLYERS RC INC.

**EAST COAST SWAMP FLYERS
R/C CLUB Inc - AMA #973**

**6th Annual
R/C SWAP MEET
Sunday, March 22 2020**

100 TABLES VENDORS - \$20/TABLE
ADMISSION - \$5 AGES 10 & UNDER FREE!

VENDOR SETUP - 7:30AM
GENERAL ADMISSION - 8:30 - 12:00

Zandri's Stillwood Inn
1074 S. Colony Rd
Wallingford, CT 06492

Easy off, easy on I-91 Exit 13

MORE INFO AT OUR WEBSITE
WWW.SWAMPFLYERS.NET
CONTACT: ECSF.SWAP@GMAIL.COM

FLORIDA

03/21/2020 - Land O Lakes, FL (E) SWAP MEET. Site: 22500 State Rd 52 BCF Area 52 Flying Field @ Conner Preserve. Mr Michael Diesu CD/EM PH: (813)995-0545. Email: mdiesu@tampabay.rr.com. Visit: baycityflyers.org. Sponsor: BAY CITY FLYERS, INC.

03/21/2020 - Sebring, FL (E) HIGHLANDS RC CLUB ANNUAL SWAP MEET. Site: 12700 Arbuckle Creek Rd. Dr Kevin M Strathy CD/EM PH: (863)991-0600. Email: kevinstrathy@gmail.com. Visit: highlandsradiocontrol.com. Sponsor: HIGHLANDS RADIO CONTROL CLUB INC.

ILLINOIS

**SWAP MEET
BELLEVILLE RC FLYERS
Saturday, 7 March 2020
MOOSE LODGE
2425 N Illinois, (Hwy 159)
Swansea, IL**

VENDORS enter at 7:30 am
GENERAL ADMISSION at 8 am
Vendors: Tables \$10 each
ENTRANCE FEE \$5
MODEL RC AIRCRAFT RAFFLE
INFO: DAN at 618-444-8063
or DARWIN at 618-205-3340

03/7/2020 - Swansea, IL (E) 16TH ANNUAL SWAP MEET. Site: 2425 N Illinois St Belleville/Swansea Moose Lodge 1221. Mr Daniel R Arens CD/EM PH: (618)444-8063. Email: rcflyerdan@hotmail.com. Visit: bellevillercflyers.com. Sponsor: BELLEVILLE RC FLYERS.

INDIANA

03/14/2020 - Angola, IN (E) TRI-STATE RC SWAP MEET. Site: 904 Williams St National Guard Armory. Mr Richard A Altekruze CD/EM PH: (260)577-0060. Email: raltekruze47@gmail.com. Visit: facebook smaklub. Sponsor: STEUBEN MODEL AIRCRAFT KLUB.

10th Annual Tri-State R/C Swap Meet
Saturday March 14th, 2020
Angola, Indiana

Radio controlled airplanes, cars, boats, drones, & accessories

Angola National Guard Armory
904N Williams St.
9:00 AM to 12:00 Noon, setup 8am

Adult Admission (kids over 12) \$5.00, women free
Wall Table rental: \$35.00, non-wall rental: \$32.00

Phil's Hobby Shop and Bremen Hobbies will be there

Information or table rental email:
raltekruze47@gmail.com

03/28/2020 - Franklin, IN (E) JCRC- FLYERS SWAP MEET. Site: Johnson County Fairgrounds, Scott Hall Bldg. Mr James W Craig CD/EM PH: (317)439-6378. Email: craig_j@att.net. Visit: jrcrf.net. Sponsor: JOHNSON COUNTY FLYERS R/C.

Johnson County R/C Flyers
2020 R/C SWAP MEET
New Location Larger Facility
Saturday, March 28th 2020
8:00am to 12:00pm
Johnson County Fairgrounds
250 Fairgrounds Street (Scott Hall)
Franklin, Indiana 46131
Vendor set-up starts at 7:00am
Doors open to public: 8:00am to 12:00pm
General admission \$5

Tables are \$12 in advance-\$15 at door
To reserve tables, contact James Craig at
317-439-6378 or craig_j@att.net

RAFFLE ITEMS:
MANGR 9 ALTRA STICK SOCC BT"
80/90 RAFFLE TICKETS

Don't stop for breakfast!
LONGS DONUTS
Kitchens will be open for Breakfast and Lunch

Please keep in mind we will have 3 events later this year,
Warbird Fly-in, Model Aviation Day and the Hoosier Fly-in

You're welcome to fly at our field after swap meet.
Facebook group JCRCF or jrcrf.net

MICHIGAN

03/8/2020 - Linden, MI (E) 29TH ANNUAL FLINT'S RC ANNUAL SWAP MEET. Site: 4070 Lahring Rd Lake Fenton High School. Mr William C Gerald CD/EM PH: (810)845-3007. Email: impalass6565@comcast.net. Visit: rcflyingaces.com. Sponsor: THE FLYING ACES R.C. CLUB INC.

03/28/2020 - Kalamazoo, MI (E) THUNDERBIRDS RC CLUB SWAP MEET. Site: 2900 Lake St Kalamazoo County EXPO Center. Mr Luis Espinel CD/EM PH: (269)373-1196. Email: espinel@ameritech.net. Sponsor: THUNDERBIRDS R/C CLUB.

NEW YORK

03/21/2020 - Bloomfield, NY (E) THE MIKE HOWELL MEMORIAL AUCTION & SWAP MEET. Site: Rhonda's Auction House. Mr James A Schwab CD/EM PH: (585)301-1107. Email: 29jschwab29@gmail.com. Visit: canandaiguaskychiefs.org. Sponsor: CANANDAIGUA SKY CHIEFS.

03/29/2020 - Buffalo, NY (E) 56TH ANNUAL AUCTION. Site: 1600 Southwestern Blvd, Ismailia Shrine Center. Mr Robert Rosplochowski CD/EM Email: highflyer22@roadrunner.com. Sponsor: RC AIRCRAFTERS OF W.N.Y.

**THE RC AIRCRAFTERS
OF Western New York Present Their**

56th Annual AUCTION
For all items related to radio control
Sunday March 29th 2020 at
Ismailia Shrine Center
1600 Southwestern Blvd.
West Seneca, NY 14224
Doors Open at 10:00 AM
Auction Starts at 12:00 AM

Door Prizes 50/50 Raffles Refreshments
Airplane Door Prize
Admission 7.00 Ladies & Kids Free

NORTH CAROLINA

**Triad Aeromodelers
22nd ANNUAL RC SWAP MEET**

Saturday March 21, 2020
Time: 8:00 AM to 1:00 PM
NC - DAVIDSON CO. FAIR EXPO CENTER
\$5.00 Admission (Ladies, Children Free)
Table reservations: Wall \$20, Aisle \$15
Contact: Mark at 336-479-8900
e-mail: mfanlsler@triadaero.org
Web Site: www.triadaero.org

03/21/2020 - Lexington, NC (E) 22ND ANNUAL SWAP MEET. Site: 100 Fairground Rd Davidson County Fairgrounds

SANCTIONED EVENT CALENDAR

Exhibition Center. Mr Mark B Fansler CD/
EM PH: (336)479-8900. Email: mfansler@
triadaero.org. Visit: triadaero.org. Sponsor:
TRIAD AEROMODELERS, INC.

OHIO

03/11/2020 - Ravenna, OH (E) 31ST
ANNUAL SWAP SHOP. Site: 7075 State
Rd 88 Maplewood Career Center. Mr
Michael P Ryan CD/EM PH: (330)296-
3633. Email: mryan@litttlekeg.com. Visit:
ravennathunderbirds.com. Sponsor:
RAVENNA THUNDERBIRDS RC CLUB INC.

03/14/2020 - Columbus, OH (E) 50TH
ANNUAL MODEL SHOW AND SWAP SHOP.
Site: 4411 Tamarack Blvd Northland
Performing Arts Center. Mr Paul C Krumm
Jr. CD/EM PH: (614)891-6999. Email:
pckrumm@aol.com. Visit: wmaa-wags.org.
Sponsor: WESTERVILLE MODEL AERO ASSN.

**WESTERVILLE MODEL
AERONAUTICS ASSN**
50th ANNUAL MODEL
SHOW and SWAP SHOP
34 Trophies in 11 categories
100 SWAP SHOP Tables

MARCH 14, 2020
8:30am - 1 pm

Northland Performing Arts
Center
4411 Tamarack Blvd
Columbus, OH 43229

SHOW INFO: (614) 891-6999
TABLE RSVN: (614) 582-9131
WWW.WMAA-WAGS.ORG

03/21/2020 - Urbana, OH (E) SWAP MEET.
Site: 1652 N Main St Champaign Aviation
Museum. Mr David Marenberg CD/EM PH:
(937)207-4105. Email: dmaren1987@gmail.
com. Visit: flyurbana.com. Sponsor: MAD
RIVER FLYING ASSOC.

Swap Meet
**Champaign Aviation
Museum**
Grimes Field, North of Urbana
OH, on US Rt. 68

March 21st 2019
Tables \$15 at the Door
go to www.flyurbana.com
to reserve tables

03/28/2020 - Lancaster, OH (E) 2020
ANNUAL LANCASTER HOBBY EXPO AND
SWAP MEET. Site: 125 E Fair Ave Fairfield
Fairgrounds. Mr Tony R Scott CD/EM PH:

(740)687-5038. Email: tonyscott40@
sbcglobal.net. Visit: flying-forks.com.
Sponsor: FAIRFIELD OHIO RADIO KONTROL
F.O.R.K.S.

PENNSYLVANIA

03/14/2020 - Lebanon, PA (E) 40TH ANNUAL
RC EXPO. Site: 80 Rocherty Rd. Todd L Lajak
CD/EM PH: (717)857-4726. Email: info@
cpaa.us. Visit: cpaa.us. Sponsor: CENTRAL
PENN AEROMODELERS.

**CENTRAL PENN
AEROMODELERS ASSOC.**
Visit Our Website: www.cpaa.us

40th Annual Radio Control EXPO

March 14, 2010 * Lebanon, PA
41,000 Sq. Ft. Indoors
602 Spaces



To Pre-Register send space
rent plus \$8.00 per person
(payable to CPAA) with
S.A.S.E. to:
CPAA
244 Ridge Road
Mechanicsburg, PA 17050
Info....Call Todd 717- 857- 4726

First Time
Renters
Call Todd
First

**CENTRAL PENN
AEROMODELERS ASSOC.**
Visit Our Website: www.cpaa.us

40th Annual Radio Control EXPO

Date: Saturday, March 14, 2020
(regardless of weather)



TIME:
9:30 a.m. - Gen Admission
10 a.m. - Space Renters Only
Info....Call Todd 717-857-4726

Advance Tickets \$8.00
Admission \$18.00 Donation (under 12 free)
Aisle Spaces: \$20.00 each (5 ft long)
Wall Spaces: \$25.00 each (5 ft long)

Place: LEBANON FAIRGROUNDS
80 Rocherty Road - Lebanon, PA 17042

03/28/2020 - Delmont, PA (E) MARC RC
FLEA MARKET. Site: 2360 PA-66 Delmont
Event Center. Mr David D Frew CD/EM PH:
(724)727-2396. Email: ddfrew@gmail.com.
Visit: remarcs.org. Sponsor: MURRYSVILLE
AREA RC SOCIETY.

03/28/2020 - Hamburg, PA (E) 27TH
ANNUAL SWAP MEET. Site: 501 Pine St. Mr
Jack D Hilbert Jr. CD/EM PH: (610)657-
5286. Email: pcchilbert@gmail.com. Visit:
tcws.org. Sponsor: TRI COUNTY WING
SNAPPERS INC.

**TRI-COUNTY
WING
SNAPPERS**



Hamburg RC Swap Meet
March 28, 2020, Hamburg Field
House, 501 Pine St., Hamburg,
Pa.19526 Located near Cabela's
I-78 & Rt. 61. Info at
www.TCWS.org 610-657-5286
Over 240 tables, 16,000 Sq. Ft.
of floor space. Free Parking.
Food available. Doors Open 8:00
AM. Adm. \$5.00, Aisle Tables
\$7.00, Wall Tables \$12.00

TEXAS

03/20/2020 - 03/21/2020 - Weatherford,
TX (E) WAMS ANNUAL SWAP MEET &
AUCTION. Site: 2121 Bethel Rd Weatherford
High School. Mr Verne B Bell CD/EM PH:
(817)629-1909. Email: vernebell@gmail.
com. Sponsor: WEATHERFORD AERO
MODELING SOCIETY.

**WAMS SWAP
MEET & AUCTION!**

Fri., March 20, 2020
• Swap Meet: 5 p.m. 'til 9 p.m.

Sat., March 21, 2020
• Swap Meet: 8 a.m. 'til Noon
• Auction: Noon 'til 5 pm

Admission \$7.00 Each Day
Table Rental \$12.00 Each Day

Weatherford High School
2121 Bethel Rd. • Weatherford, TX
Exit 406 East on Service Road
Exit 408 West on Service Road

For Info, Call Verne 817-629-1909
vernebell@gmail.com

WISCONSIN

03/1/2020 - Kaukauna, WI (E) 35TH ANNUAL
R/C SHOW & AUCTION. Site: W2091 County
Road JJ Starlite Club. Mr Tim A Stadler CD/
EM PH: (920)475-3998. Email: flyvam670@
gmail.com. Visit: flyvam.com or facebook.
Sponsor: VALLEY AERO MODELERS, INC.

Sanctioned Event Calendar Listing and Ad Information

Questions about either Sanctioned Events listings or Supplementary Ads should be directed to AMA's Competition Department at (765) 287-1256, ext. 252. Send ads to: AMA Headquarters, Attn: Competition Dept., 5161 E. Memorial Dr., Muncie IN 47302 or via email to: competition@modelaircraft.org.

MA MARKETPLACE

Advertising opportunities are now available for display ads in the MA Marketplace. Visit www.ModelAviation.com/advertise for information and pricing.

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E-mail: mddgem@gmail.com

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Lee Custom Engines, 10112 Woodward Ave., Sunland, CA 91040 (818)352-3766

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are just a
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Display Marketplace ads are available in one size only (2-1/4" wide x 2-3/8" high). Please refer to www.ModelAviation.com/advertise for information on preferred file formats accepted. If you need help in creating artwork, it is available for a modest fee - contact our sales representative at www.ModelAviation.com/advertise for details.

Up to 15 display Marketplace positions are available, one ad space per advertiser, placed randomly, for a length of up to 6 consecutive issues.

When a scheduled campaign is completed, that advertiser may advertise again, asking to be added to the rotation list. Once other advertisers have had the opportunity to run, a new campaign can start.

For Text Marketplace, please refer to www.ModelAviation.com/ advertise. All Text Marketplace ads may run for more than one month at a time.

No frequency or other discounts are applicable on any Marketplace ads. Visit www.ModelAviation.com/advertise for payment details.

Illegible ads and/or ads received without the proper payment amount will be discarded. Ad and payment must be received by the 15th, and there is a 2-month leadtime. For example: April 15 for the June issue.

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No proofs or tear sheets will be sent.

INDEX OF ADVERTISERS

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Advertising Account Executive

Jonathan McGraw (410) 316-9863

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A

AJ Aircraft www.aj-aircraft.com	17
AMA Foundation http://amafoundation.modelaircraft.org	102
AMA Government Affairs www.modelaircraft.org/gov	41
AMA Podcast www.modelaircraft.org/podcast	52
AMA Shop Online www.modelaircraft.org/shopama	CV3

B

B&B Specialties www.bennettbuilt.com	94
Balsa USA www.balsausa.com	57
BetaFPV https://betafpv.com	5
BMJR Models Inc. www.bmjrmovels.com	62

C

Camp AMA amaflightschool.org/campama	42
CARF Models Ltd. www.carf-models.com	79
Chief Aircraft www.chiefaircraft.com	83
Crain Engineering www.craineng.net	94

D

Desert Aircraft www.desertaircraft.com	7
Du-Bro Products www.dubro.com	91

E

E-flite www.horizonhobby.com	CV2
Ernst Manufacturing Inc. www.ernstrc.com	93
Esprit Tech www.esprittech.com	75
Extreme Flight R/C www.extremeflightrc.com	10-11

F

Flex Innovations www.flexinnovations.com	95
Flying Aces Club www.flyingacesclub.com	98
Flying Tiger RC www.flyingtigerrc.com	90
Futaba Corporation of America www.futabausa.com	23

G

Georgia Aircraft Modelers Association, Inc. www.gamarc.com ..	71
Graves RC Hobbies www.gravesrc.com	70

H

Harbor Freight Tools www.harborfreight.com	66-67
Hextronik Limited www.hobbyking.com/modelaviation	48-51
Hitec RCD, Inc. www.hitecrcd.com	47

I

ICARE/ICARUS Sailplanes and Electrics www.icare-icarus.com	65
---	----

J

J & L Power Products www.jlproducts.net	69
---	----

L

Landing Products www.apcprop.com	82
---	----

M

Mile High RC www.milehighrc.com	74
---	----

O

Ohio Superstar Products www.ohio-superstar.com	86
Old School Model Works www.oldschoolmodels.com	89

R

Retro RC LLC www.retrorc.us.com	98
RTL Fasteners www.rtfasteners.com	94

S

Sig Manufacturing Co., Inc. www.sigmg.com	41
Spektrum Radios www.spektrumrc.com	CV4
Sullivan Products www.sullivanproducts.com	61

T

Toledo Weak Signals R/C Expo www.toledoshow.com	78
Tower Hobbies www.towerhobbies.com	1

V

Venom Group www.venom-group.com	87
--	----

Z

ZAP Glue www.zapglue.com	23
---	----

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RC PARAMOTOR IS A WORK OF PASSION

Photos by James Presnell | rcairadventures@gmail.com

A FEW YEARS AGO, James Presnell, from St. George, Utah, set out to design and build his own RC paramotor.

“As a seasoned RC pilot of nearly 30 years, I had flown pretty much everything else and was always fascinated by fabric wings,” he wrote. “[I soon discovered that] there is almost no information shared in the RC community when it comes to paragliders and paramotors.”

James used his engineering background to build and test his own designs. He purchased a commercial unit to get some flight experience and trained as a full-scale paraglider pilot to learn more about the flight characteristics.

Nearly five years later, the designs were complete. “Not only were they beautiful in the air, but I [would] put them up against any

commercial model on the market today,” he wrote. His next step was to publish a full set of plans for two of the wings and teach others in the RC community how to build and fly paramotors. He posted the plans in forums and videos on his YouTube channel to teach others the skills that they would need to build and fly RC paramotors.

James has received many photos and videos from others who have built his designs. “In general, the community has been quite appreciative [of] my designs and assistance. Since starting, I have also published designs for a cart and continue to help other builders complete the designs I have shared—and even to design their own wings.”

The larger-scale wing shown in the photo is 13 feet from tip-to-tip, and includes a 3D-scanned reproduction of James as the

pilot. He made the clothes for the pilot from discarded elements of his own wardrobe.

“All of the wings I have made were designed, cut, stitched, bridled, and flown by me alone,” he stated. “They are truly a work of passion and a great joy to fly.”

Visit James’ YouTube channel at www.youtube.com/rcairadventures. 

➔ SHARE YOUR STORY

Do you have a high-quality/high-resolution airplane, helicopter, or multirotor photo that you are proud of, or a model aviation-related photo with a great story behind it? Email your “Viewfinder” photo and a description about it to jennifer@modelaircraft.org.



PAUL KAUP

*STEM educator and
airline pilot*

By Jay Smith | jays@modelaircraft.org

Jay Smith: *How did you get involved with model aviation?*

Paul Kaup: I was always curious and have been interested in model aviation ever since I can remember. Growing up, my family did not have extra money to spend on a hobby that, at that time, was expensive to get involved in and, without a mentor (or YouTube back then), your chances of being successful were low. I stuck with plastic model airplanes instead. After graduating from high school, I went for an introductory flight in a Cessna 152 and I have been infected with the aviation bug ever since.

JS: *How has model aviation impacted your life and/or career?*

PK: Model aviation has impacted my life tremendously. I not only have enjoyed the hobby over the past 12 years or so, but I use model aviation as a STEM tool in the classroom. I currently facilitate the Perry High School, Richmond-Burton High School, and a community-based group of students.

There is no difference, from an aeronautics perspective, between how a Flite Test

Tiny Trainer flies or one of my Boeing 737 airplanes that I fly for a living. Using model aviation in the classroom serves multiple purposes. It introduces students to the physics of flight; it gives me an opportunity to mentor the students into the hobby; it gives them the ability to conduct hands-on engineering; plus, it brings together a small community of students with a shared interest. It's a win, win, win situation.

I do not fish, I do not hunt, and I do not golf, so facilitating and mentoring the students is what I enjoy at this point in my life. It is very rewarding to see them enjoy the hobby.

JS: *What disciplines of modeling do you currently participate in?*

PK: I fly small foamies and trainer airplanes like the Flite Test Tiny Trainer and the new Scout. I have been so busy teaching and mentoring that all of my flying has been buddy-boxing with students. We took part in Strato Journey at Spaceport America [in New Mexico], and for several weeks, I mentored the students on operating the Rvjets that they built for the competition.

My current project is a solar-powered RC airplane. I'm working on a 150-watt system to power a 1,100-gram vehicle. I love the engineering aspect of the hobby. Engineering an airplane and then flying it is so rewarding.

JS: *What other hobbies do you have?*

PK: I am a Near-Space Balloon guy, a HAM


radio license operator, and I have my Level 1 rocketry certification.

JS: *Who or what has influenced you the most?*

PK: I think the moon landings, the Kepler space telescope, and the upcoming James Webb Space Telescope have influenced and interested me the most. Those programs influenced me to throw big challenges out there to the students. Not can we build a solar-powered airplane, but we will build a solar-powered airplane ... Not *can* a bunch of motivated high school students build a rocket capable of reaching space, but the high school students *will* build a rocket capable of reaching space. My motto is: "Do. There is no try."

JS: *How can members and clubs get involved with STEM?*

PK: It takes the right type of personality to be involved with the students and present STEM concepts. Being a mentor/facilitator is not for everyone. The best way that clubs can help with STEM and STEM outreach is by fostering or providing a "mentoring day." We do this at Arizona Model Aviators with a program that I run called Taking Flight. It is designed to introduce the hobby to students and adults who might be interested in getting started.

During this two-day event, we reach out to the public and private school communities to bring their students and teachers to the club to see how the hobby is such a great aeronautics STEM tool/activity. We also give everyone the ability to build and fly their airplanes. Members of the club bring their trainer airplanes out during those two days and offer to buddy box with anyone who is interested. 





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