Radio Controlled Soaring Digest

February 2013

Vol. 30, No. 2

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Front cover: Dave Garwood's Alula Evo flies over Wilson Lake Kansas. Dave's review of the Alula Evo starts on page 4 of this issue.
Canon EOS 40D, ISO 400, 1/750 Sec., f13, 135mm

Back cover: Adrian Bardet pilots a Custom Enigma across the moon near sunset. Photo by Daniel Enrique Galardi, Club Aeromodelistas Ciudadela, Buenos Aires, Argentina.
Nikon Coolpix 510, ISO 100, 1/160 sec., f8.3, 180mm

R/C Soaring Digest

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RC Soaring Digest is published using Adobe InDesign CS6

In the Air

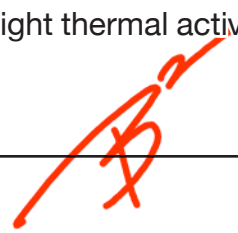
A rather slim issue this month.

Our sincere thanks to Dave Garwood who has been working on the Alula Evo review for quite a long time. The original Alula and the newer Alula Evo pretty much defy classification. They can be side-arm launched (SAL), flown on the slope or flat land, and are quite easy to transport. The Alula Evo can be equipped with an optional magnetic locking system which allows the wings to be removed from the fuselage pod for even easier transportation. Dave's been able to take his Alula Evo on numerous trips – Santa Barbara California, Wilson Lake Kansas, and numerous beaches and hillsides in the Northeast United States. As we said about the original Alula, it's more fun than man was meant to have. Dave's detailed review of the Alula Evo kit starts on page 4.

Danny Chapman has completely re-written his Slope Soaring Simulation program and made it into an app for iOS devices, Android appliances, and Windows machines. Now named PicaSim, our review of the app on the iPad platform is in this issue starting on page 22. Free or close to it (prices range up to $3.21 depending on platform), PicaSim deserves your attention if you have an iPad, iPhone, Android appliance or Windows computer. And you can hook up a transmitter to your Windows machine for added flying realism. Our review of PicaSim begins on page 22 of this issue.

Belonging to a local club with members sometimes intent on flying in somewhat adverse conditions can have its advantages. Larry Dunn, a member of our local EFLAPS (Eco-Friendly Little AirPlane Society), went out on one of our cold wet days with his electrified Bubble Dancer and, surprisingly, found some light thermal activity. See page 27!

Time to build another sailplane!



Kit Review

DREAM-FLIGHT alula evo

Dave Garwood, dave.garwood.518@gmail.com

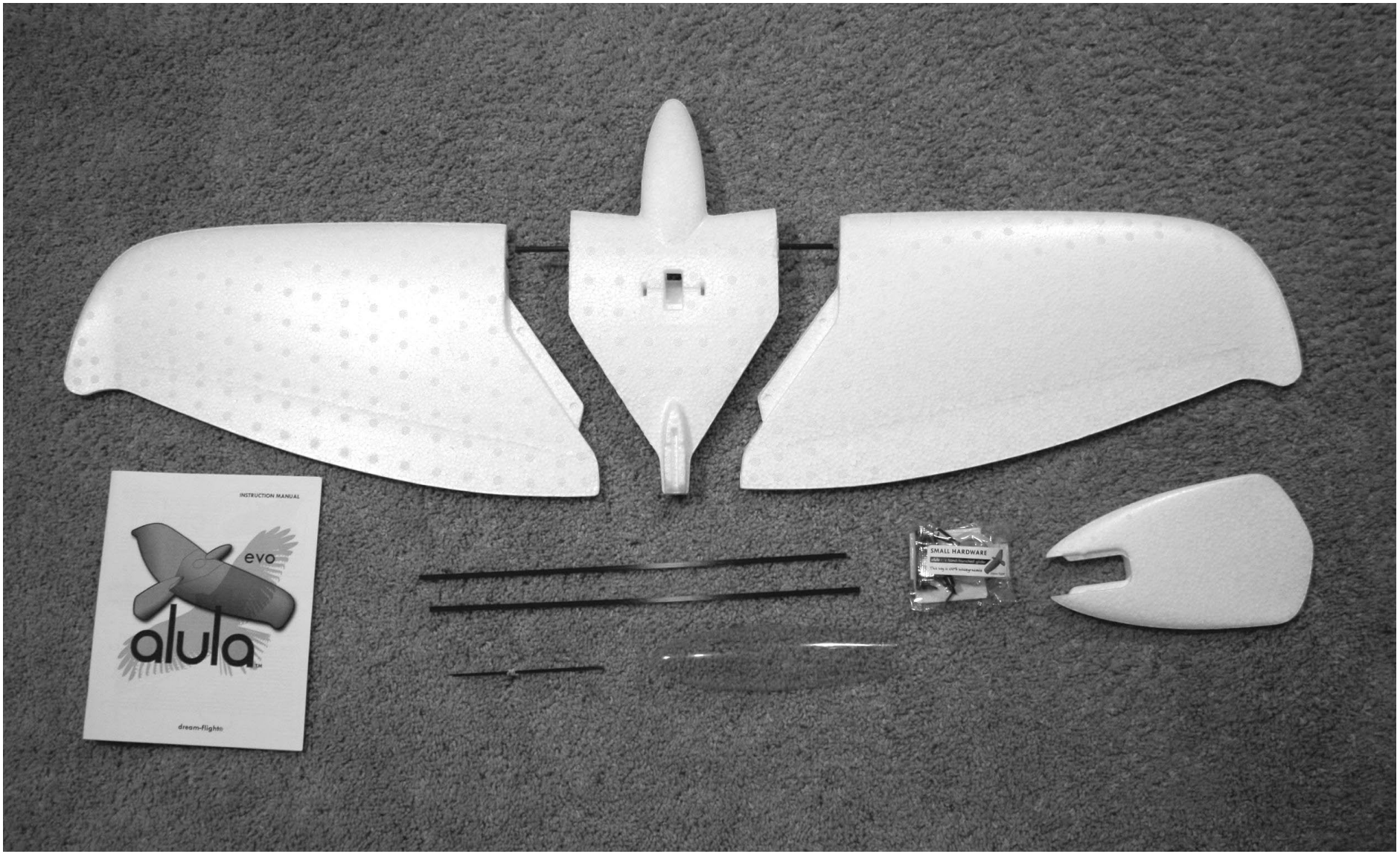
The Dream-Flight Alula Evo sidearm-launch, slope soaring, and backpack glider is a remarkable sailplane that establishes and defines its own category. Not many model airplanes distinguish themselves in each of these three glider niche activities, but this one does.

The Alula is a proven design that began a decade ago as a hot wire cut kit, grew rapidly in popularity, and today the Alula Evo (for evolution?) is available as a molded-parts kit of unparalleled precision and engineering acumen. The kit builds very quickly into a tough, well-mannered, versatile and fun-to-fly slope glider. Wingtip grip tape is included for sidearm launch, and it can be built with an optional magnet kit, and thus quickly be disassembled for transportation and storage, including backpacking and saddle bagging.

There is a lot to like about the Alula Evo, starting with what comes in the box, which is manufactured in the USA.

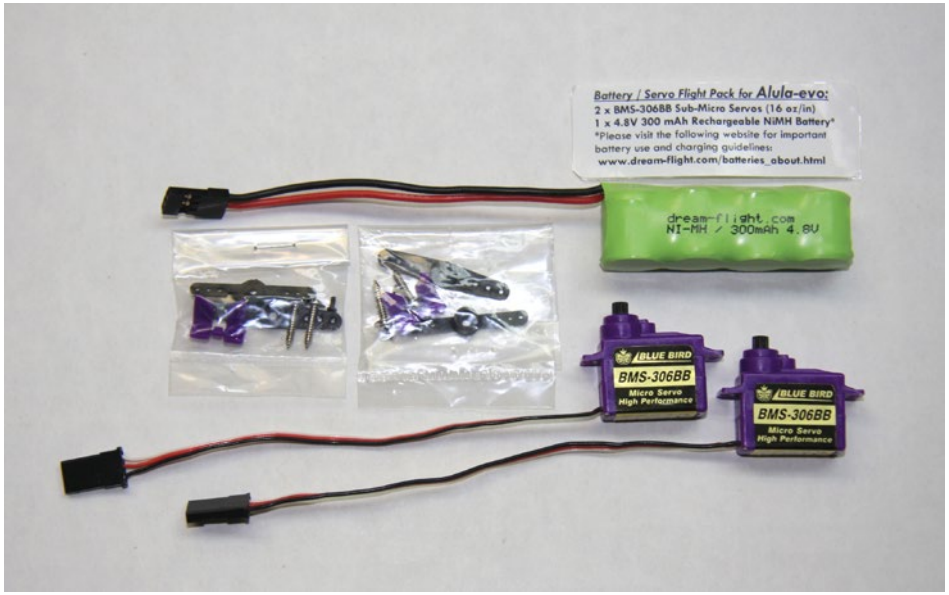
ALULA-EVO SPECIFICATIONS

- Wing span: 35.4 in (900mm)
- Wing area: 259 sq.in (16.7 sq.dm)
- Weight range: 5.8 - 6.5 oz (164-184 grams)
- Wing loading range: 3.2-3.3 oz/sq.ft (9.3-10.2 gm/sq.dm)
- Wind speed range: 0-15 mph
- Building time: 1-2 hours (plus delta wing radio setup time)
- Minimum radio requirements: Minimum two-channel, with elevon mixing with dual rates and ATV (Adjustable Travel Volume).
- Recommended on-board components: sub-micro receiver and two sub-micro servos



Kit contents include molded fuselage, wings and fin. Also carbon spars, carbon pushrods, a molded clear belly skid, small parts bundle and the best instruction manual in the model airplane industry.

Small parts include choice od decorative decals, clear "gripper" tape for tip-launch finger hold, wonderful 3M Blenderm tape, elevon control horns, matching clevises, CF elevon pushrods, and CF tube joiners.



Factory recommended on-board components for Alula Evo includes two Blue Bird BMS-306BB sub-micro servos, and a 4.8V 300mAh NiMH battery pack.

KIT CONTENTS

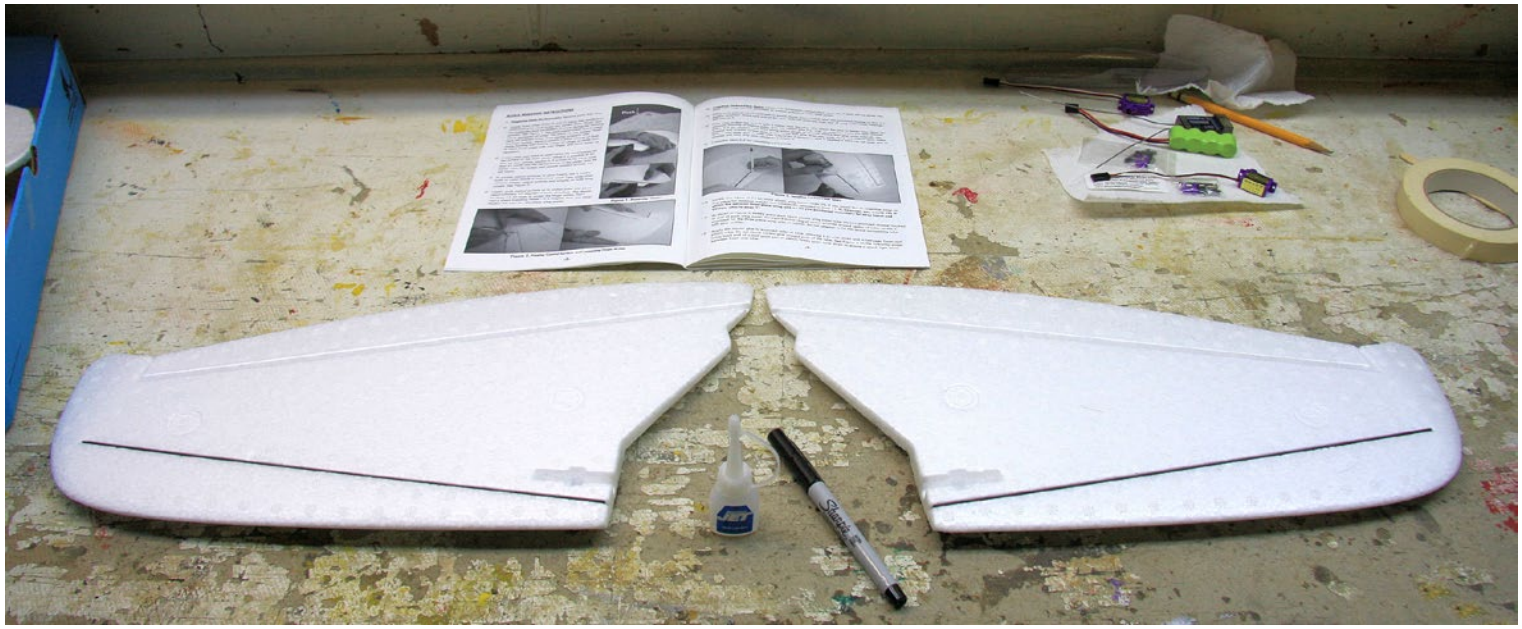
The largest kit components are four molded EPO (expanded polyolefin) parts: wings, fuselage and vertical stabilizer. This light and stiff material seems to be a fine choice for small-glider airframe construction. The elevons are molded as components to the wings. The careful attention to design and accuracy in molding of these parts is remarkable. We are far beyond hot-wire cut slope sailplane production with an Alula Evo.

A clear vacuum-formed belly pan covers the receiver and battery compartments molded into the underside of the fuselage, and protects them during landing. The belly pan is taped in place and is removable for accessing these components.

A carefully selected hardware package includes lightweight linkages, plastic joiner tubes, decals, and the excellent 3M Blenderm tape for solid hold yet removability for the belly pan, wings, and vertical stab.

The 32-page construction manual is an artistic and literary work in itself. Detailed, clear, thoroughly illustrated with photos and drawings, well laid out and fun to read. This is the best instruction manual I have seen in my 115 model airplane kit builds.

I also ordered from the manufacturer the "Standard Flight-Pack for Alula Evo" which includes two Blue Bird BMS-306-BB sub-micro servos, and four-cell 300mAh NiMH battery. The airframe is molded to fit these servos and the



Begin construction by installing CF strip wing spars into molded slots and securing with thin CA glue.

Servos and receiver preliminary radio setup check. The Futaba T6J makes quick and easy work of setting up elevons that have small elevator throw and large aileron throw.

custom battery pack, and their slide-into-place fit is another joy of building this kit.

BUILDING

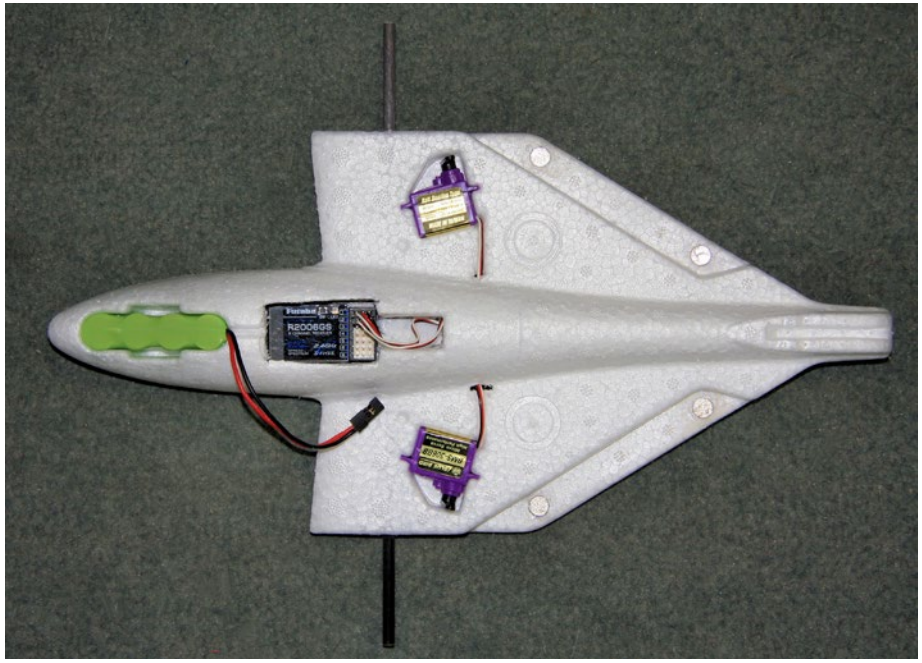
Dream-Flight is not exaggerating when they say it builds in two hours. The airframe construction steps are: (1) remove molding flash, (2) install CF spars plastic joiner tubes, and control horns with CA glue, (3) install servos, receiver, battery and arrange wiring, (4) trim and install plastic belly pan with tape, (5) attach wings with glue, tape, or optional magnet kit, (6) balance on a pair of pencil points at the molded dimples. Mine took about 3/4 ounce in the nose to balance.

Decorating. Enough has been written on markings designs to make another article. At the least, a couple stickers, or a spray of Tamiya Color for Plastics on the tips works fine. Some builders have worked out extensive geometric designs, and others followed the airframe's bird-like shape with representations of feathers. See the RC Groups build thread for decorating ideas. On mine, I started with a couple stickers, and later my artistic wife helped me out with the Sharpie marker feather drawings on the upper side.

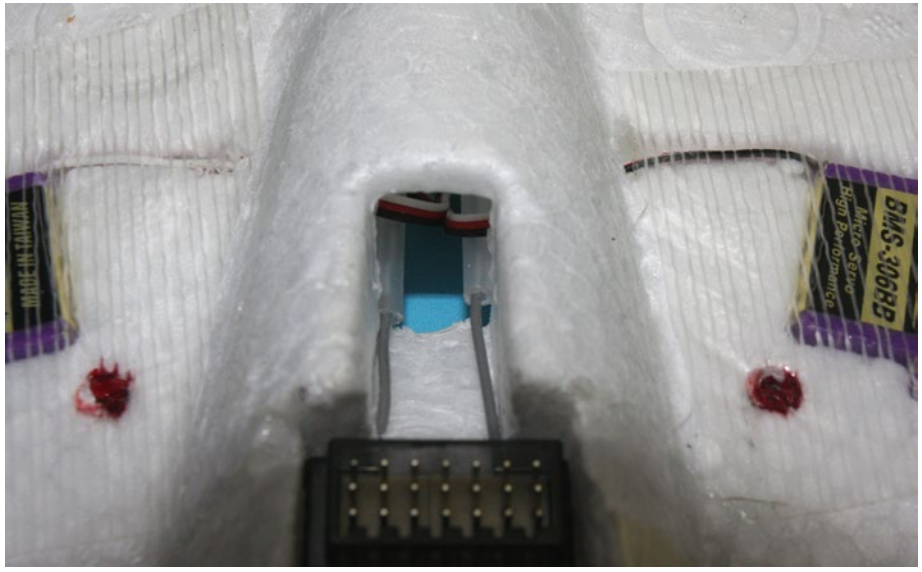
BUILD MODIFICATIONS

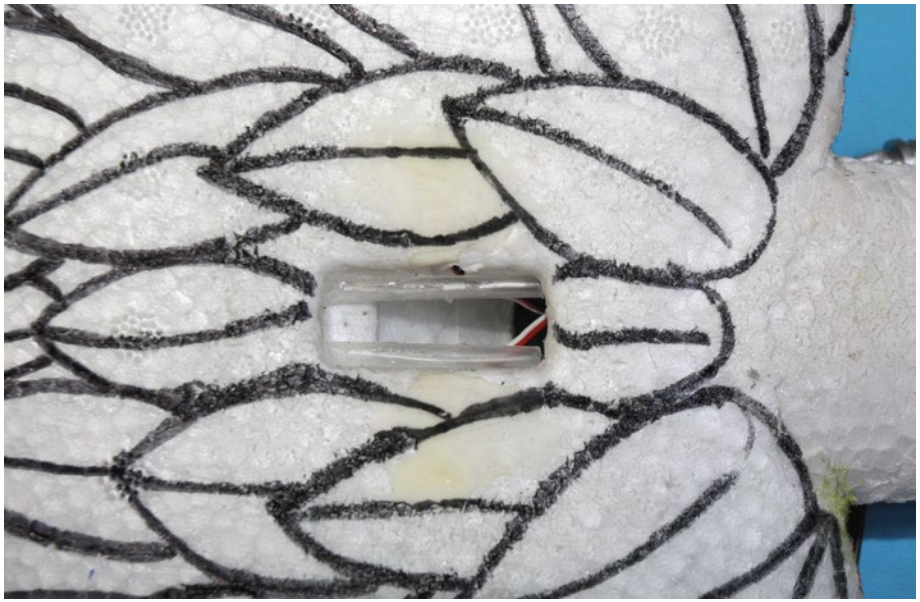
I made two modifications from the building instructions, first was to change the location of the on/off switch. The instructions say in Step 34 on page 9,

Layout of on-board radio components, each nestled into its own molded bay. Note that the receiver bay had to be enlarged for the R2006GS receiver to fit. This is a good spot for a really small receiver. Note also magnets installed where wings mate up for an airframe that disassembles easily for easy storage and transportation.

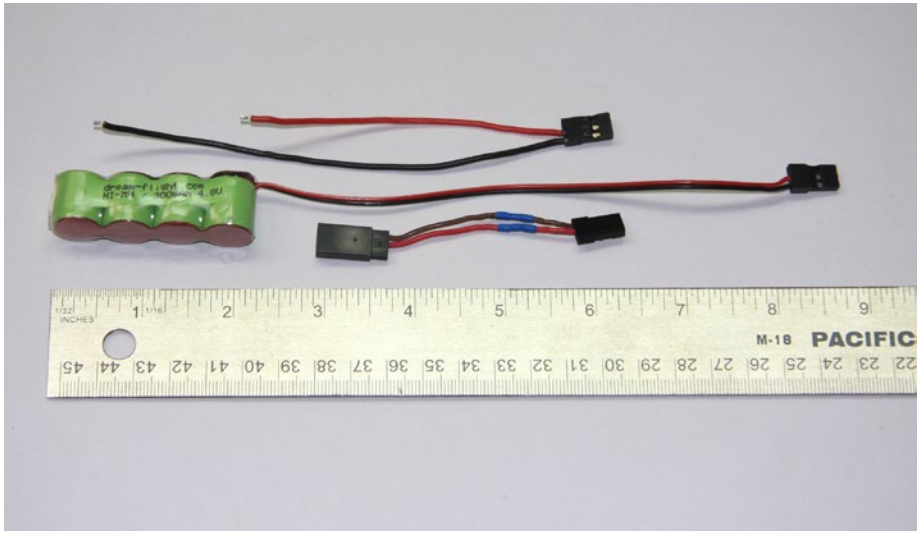


Antenna tubes for dual 2.4 antennas, view from underside.





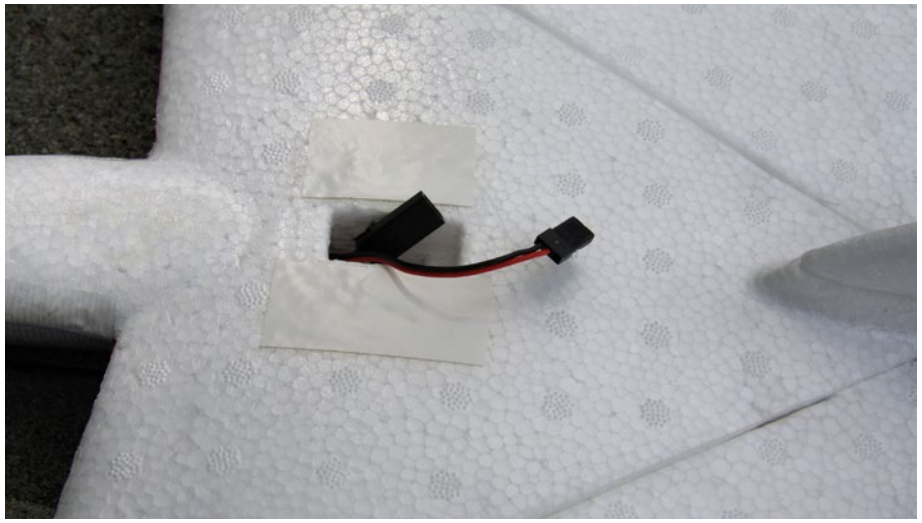
Antenna tubes for dual 2.4 antennas installed along the sides of the opening at the center of the wing, view of upper side.



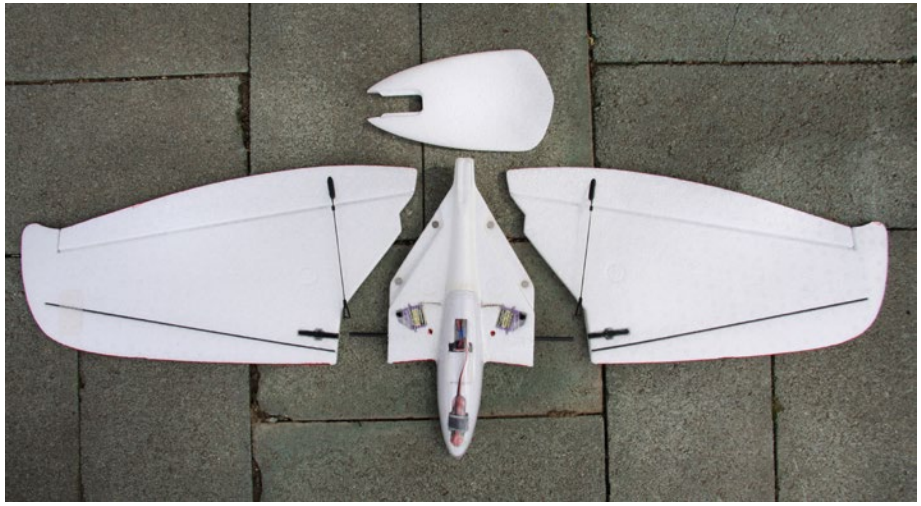
Dave's modification to battery pack lead to allow plug/unplug on/off switch at upper side of the model, rather than making a hole in the belly pan.

"Due to the Alula's small size and light weight, no switch will be used. We recommend simply plugging battery directly into the receiver for power. This is done via small oval cut-out located on the skid pad."

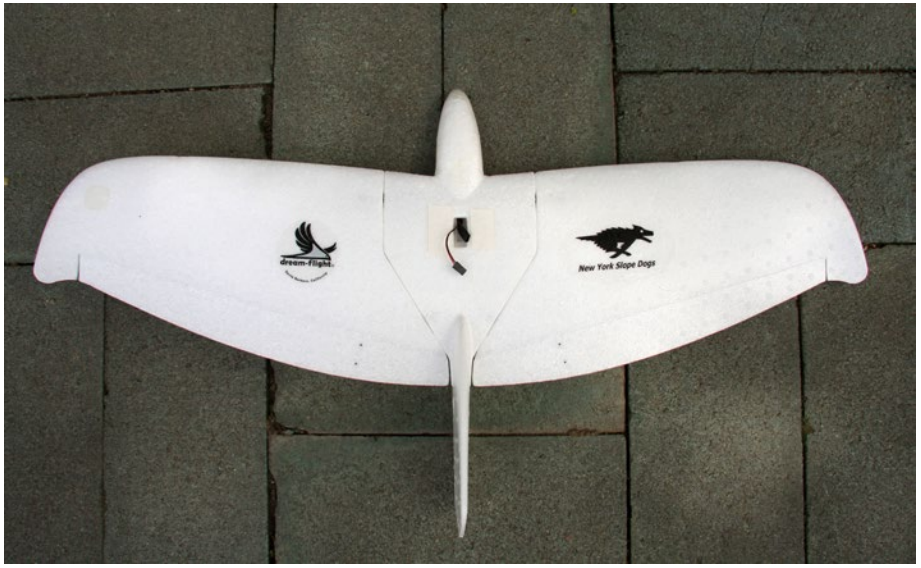
"Skid pad" means the tough, hard plastic belly pan which is taped in place on the under side to cover the battery pack, nose weight, and receiver. I could not bring myself to open a hole in the belly protector, on which the model touches down on most landings, and allow an opening for sand, dirt and debris. My solution was to lengthen the battery pack wires from four inches to six and a half inches, and to add a three and a half inch servo extension cable, and run both up through the molded opening at top center of the wing. Plugging the connectors together powers the receiver, and the belly pan remains intact.



Dave's plug/unplug on/off switch at top side of the model. Additional openings filled with epoxy mixed with microballoons and/or covered with white tape.



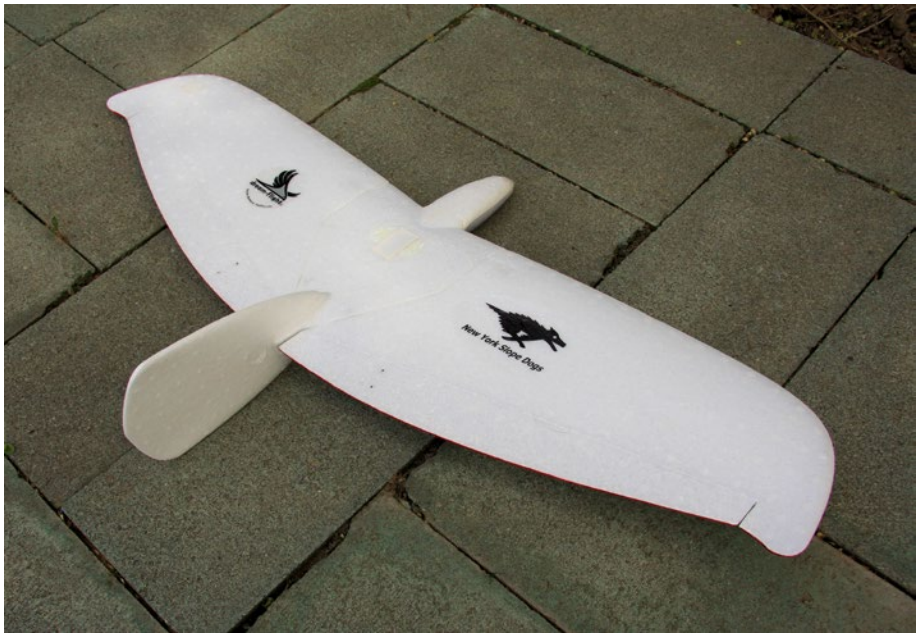
Alula Evo airframe disassembled for transport, under side.



Alula Evo completed airframe upper side.

Alula Evo airframe disassembled for transport, upper side.

Alula Evo completed airframe under side.



Alula Evo ready to fly. Top: Dave's plug-in receiver switch unplugged. Above: Dave's plug-in covered with white tape.

SPECIAL NOTE ON RADIO EQUIPMENT

Well known slope flyer Greg Smith is another hard core fan of the Weasel and he notes the following in his review on www.slopeflyer.com. Greg is writing about the Dream-Flight Weasel, but his comments apply 100 % to the Alula Evo.

"In order for the Weasel-pro to maintain the flight characteristics described above, micro size radio equipment is required to keep the weight down. The Weasel-pro is a very pitch sensitive aircraft and therefore requires dual rates or ATV (Adjustable Travel Volume) on at least the elevator channel (channel #2 in most cases). You will need to have the capability to reduce the throw percentages down to 20%. Most computer radios have this function. Unfortunately, the inexpensive 2 and 3 channel radios with just v-tail mixing do not have these sensitivity adjustments, making it difficult to fly this glider with them. So please invest in a radio with dual rates and/or ATV."

On the matter of antenna location for 2.4 GHz receivers, my instruction booklet dated October 2012 is silent. Step 36 on page 11 covers installation of a 29-inch long 72 MHz antenna, and notes that the one-piece fuselage option is required to install the full length of that size antenna. Now in the time of 2.4 GHz radio sets we need to locate a pair of six-inch antennas. My solution was to drill holes and glue a pair of clear tubes in the molded opening at top center of the wing and insert an antenna in each.

I cut my short tubes from an actual "antenna tube" material from the old days, but many types of small non-conducting

tubes could be used, including coffee stir tubes or control pushrod outer tubing. Sliding the antennas into tubes makes it much easier to remove the receiver from the airframe should that become necessary.

FOR HAPPY FLYING, CAREFUL SETUP

My only consternation with the design is that it's exceedingly sensitive to proper setup. Poor selection of balance point (CG), aileron throws or elevator throws will give you a glider that's not so fun to fly.

Lucky for us, slope sailplane wizard Steve Lange has provided a solution for us in his online article "Fine-Tuning a Weasel" available at <http://sbslopers.org/index.php?pid=10>. While Steve is writing here about the Dream-Flight Weasel, his approach to airframe setup and tuning applies to the Alula Evo.

Steve presents the setup and tuning steps in a logical order, and explains how too much or too little of each setup checklist item affects flight, and how each can be optimized to suit a pilot's flying style. In addition to the oft-cited dive test and inverted flight test, Steve adds the roll test as a final check on CG location. Steve introduces the loop test to gauge elevator throw. Thanks, Steve.

FLYING

When set up and tuned, the Alula Evo is a delight and a joy to fly. It launches easily, flys in wind from 5-15 MPH (or no wind for sidearm-launch thermal hunting). It is at the same time comfortably stable and highly maneuverable. Inverted flight is almost the same as upright. Inside loops are easy and pretty, as expected, fast and slow rolls are axial, and outside loops are possible in good lift with a preparatory dive.

In October 2012, the philosopher and flying buddy Jan Carstangen and I sat on a park bench together, flying in 12 MPH winds over the Cape Cod Bay in Truro, Massachusetts for hours. I asked Jan what he thought were the essential characteristics are of the sailplanes we most like to fly.

He replied: "They groove. They carve a turn like skiers, snowboarders, surfers. They are both stable and agile. They will fly hands off when you want a rest, and they are maneuverable enough for aerobatics when you want aerobatics."

Jan further said, "I have the most fun with a plane that you don't have to keep chasing. You put the plane in a bank and give it a little elevator, and it carves its own turn. It holds the turn until you roll it back out to fly straight and level."

We flew five different slope gliders that afternoon, and even swapped transmitters and flew each other's planes. The glider Jan was flying when he made those remarks: the Dream-Flight Alula Evo.

FUTABA 6J RADIO SYSTEM

For my Alula I used the Futaba 6J 2.4 Ghz six-channel transmitter and R2006GS receiver, which are shipped together as a radio set. I've used five six-channel computer transmitters over the last 20 years and none of them are as easy for me to program for a delta-wing glider as the "6J."

With this transmitter it was dead easy for me to fine tune the small elevator throw and the large aileron throw using the throw percentages method mentioned both by Greg Smith in his Dream Flight Weasel review and by Michael Richter in his Alula-Evo construction manual.

The Futaba R2006GS that came with the radio set required some foam carving to fit in the Alula Evo airframe. Very small receivers are a boon with this model. Builders might consider the Futaba R2106GF sub-micro receiver compatible with the 6J, although the micro is rated for indoor and close-in flying.

A very fine design feature of the Futaba 6J is its internal broadcast antenna. No external antenna to snag, poke, or break off.

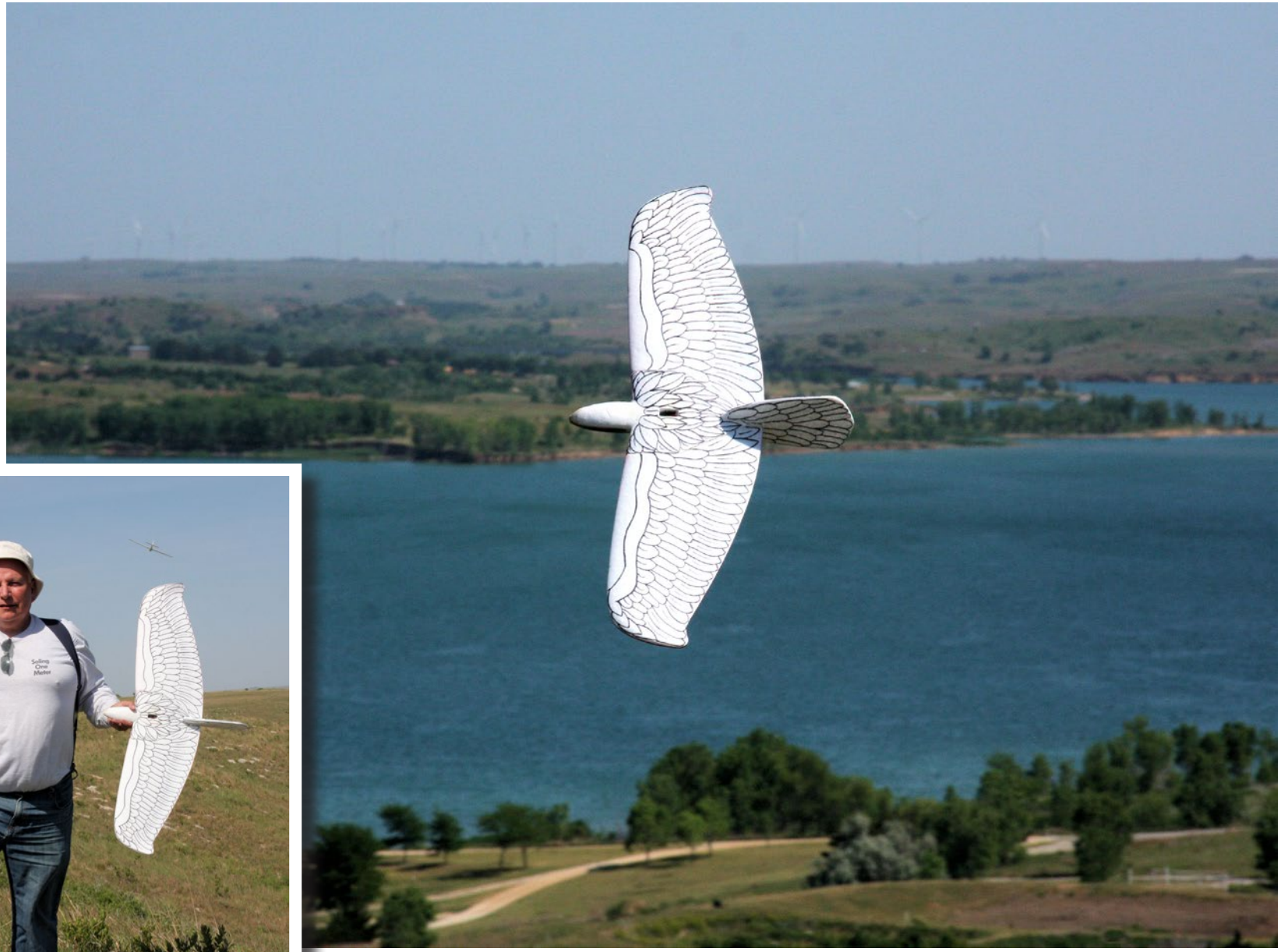
Traveling Alula

Traveling Alula reassembled after shipping and ready to fly again.

Dave with an Alula at Ellwood Bluff in Santa Barbara, California on the day after the 2012 Weasel Fest.

Above: Alula on a beach run. Cape Cod Bay, Truro, Massachusetts.

Right: Dave with traveling Alula at the Atlantic Ocean. In the background is Cape Cod Bay, Truro, Massachusetts. Photos by Jan Carstanjen.



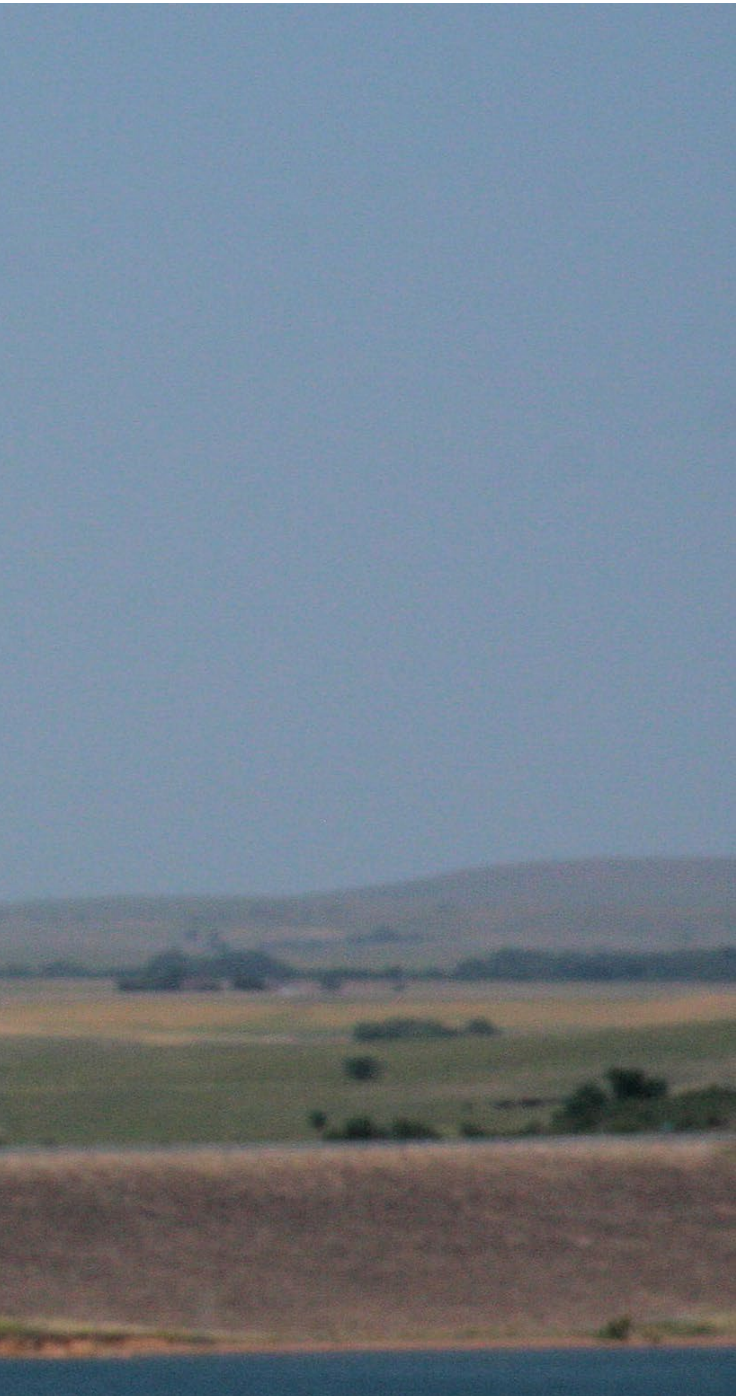
Above: Alula over Wilson Lake. Lakeside camp ground 200 feet below main hill in Lucas Park. Left: Dave with traveling Alula and favorite Futaba T6J transmitter at Wilson Lake, Lucas, Kansas during 2012 Midwest Slope Challenge. Photo by Joe Chovan.

Left: During inverted flight testing, OFB Joe Chovan found he liked the CG further back. The dark circle on the fin is a taped on quarter.

Above: Dave with traveling Alula at the Susquehanna River at Breezy View Park in Lancaster, Pennsylvania.

Left: Dave in the Taconic Mountains on the New York - Massachusetts border. The tip-launch capability of the Alula was welcome and used to get over the tree line which has grown up at this site. On the other side of the tree line is an 800-foot slope. "Taconic" is from a Native American word meaning "in the trees." Gotta have a reliable and well-trimmed sailplane to fly at Petersburg Pass.

Alula turns and burns over Wilson Lake, here performing a roll. Lakeside camp ground 200 feet below main hill in Lucas Park.



CONCLUSION

The most important themes in this article are that the Alula Evo is a wonderful glider, superbly designed and manufactured, and also that it's important to pay close and careful attention to airframe balance, and control surface setup. Without it, you will find yourself flying a nasty nugget, wondering why so many other slope and HLG pilots praise its performance. Get it right and you'll have a sailplane that dances like a ballerina.

For successful setup, start with the instructions in the construction manual, refer to Steve Lange's article if needed, and pay close attention to fine tuning your own setup.

If you fly in light lift, fly hand-launch, and travel with a small sailplane, I'll bet you will be happy to have an Alula Evo.

Alula over Wilson Lake, Lucas Kansas. Wilson Dam in background.

RESOURCES

Dream-Flight (Alula Evo kit)
<http://www.dream-flight.com>

Futaba (Futaba 6J radio system)
<http://www.futaba-rc.com/systems/futk6000.html>

Alula-Evo build thread on RC Groups
<http://www.rcgroups.com/forums/showthread.php?t=1065996>

Steve Lange "Fine-tuning a Weasel"
<http://sbslopers.org/index.php?pid=10>

Greg Smith "Special note on radio equipment - PLEASE READ"
<http://www.slopeflyer.com/soaring/weasel/weasel-pro.html>

Software review

Bill Kuhlman, bsquared@centurytel.net

Danny Chapman is a photographer, musician and RC soaring enthusiast with an array of computer skills and a formal background in meteorology. Put all of those skills together and over a relatively short period of time the combination evolves into the production of an RC flight simulator with the moniker SSS (Slope Soaring Simulator).

As a member of the SSS Yahoo! Group <http://games.groups.yahoo.com/group/slope_soaring_sim/>, I have been following the development of this piece of software over the last several years.

Written for the Windows OS and distributed under the GNU General Public License scheme, SSS is primarily what its name implies, a slope soaring simulation. Interestingly, SSS is built using a number of components - aerodynamics, physics and graphics - with each component open to either modification or replacement. The latter capability is especially impressive, as parts of the Charles River RC simulator, CRRCSim <http://groups.yahoo.com/group/crrcsim/>, are relatively easy to import.

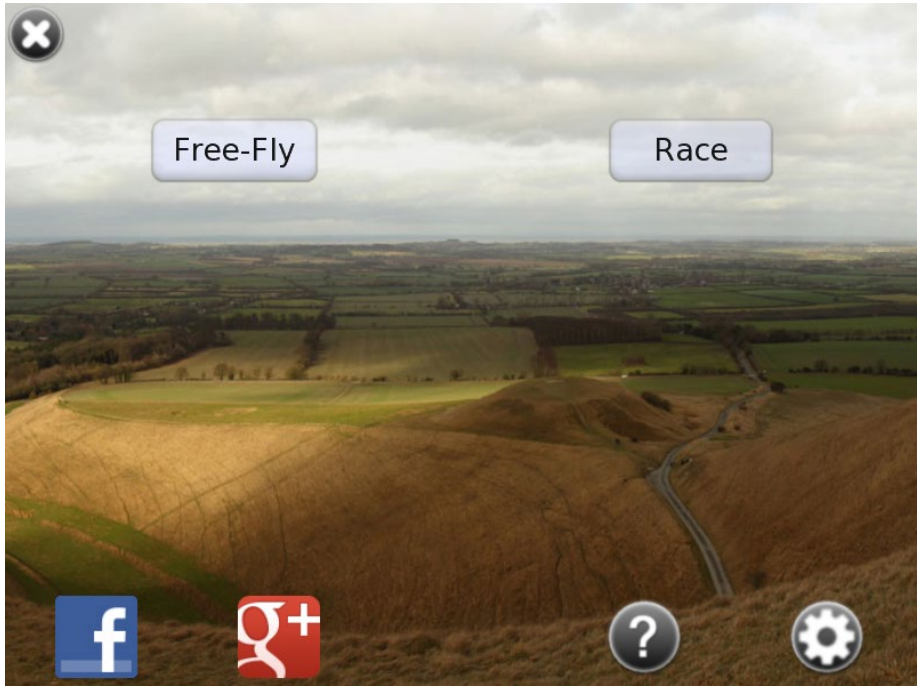
SSS is also impressive in that there are a number of flight regimes, in addition to scenery options and aircraft choice. Dynamic soaring, slope racing and thermal soaring are possible, with control by either mouse or joystick.

SSS is available in the Files section of the SSS Yahoo! Group <http://games.groups.yahoo.com/group/slope_soaring_sim/> page.

In mid-November of 2012 Danny announced that a completely re-written version of SSS was being released for the iOS (iPhone 3GS, 4, 4S and 5, iPad, and iPod touch 3rd generation and above) and Android. In late November he announced availability of a Windows version (Windows XP and above). And, because this was a re-coding from the ground up, it was given a new name - PicaSim.

We downloaded PicaSim onto a first generation iPad from the Apple iTunes Store and had it up and running very quickly. A short while later we did the same with a third generation Retina screen iPad with the same results.

Starting PicaSim on the iPad brings up an initial basic setup screen which asks if you want to free-fly or race. If you've run PicaSim previously, any aircraft and scenery settings previously saved



The initial opening screen once PicaSim starts.

Pressing the Gear logo at the lower right of the screen opens this scrolling list of available basic settings. Pressing the Advanced button opens a new screen with a plethora of variables open to manipulation.

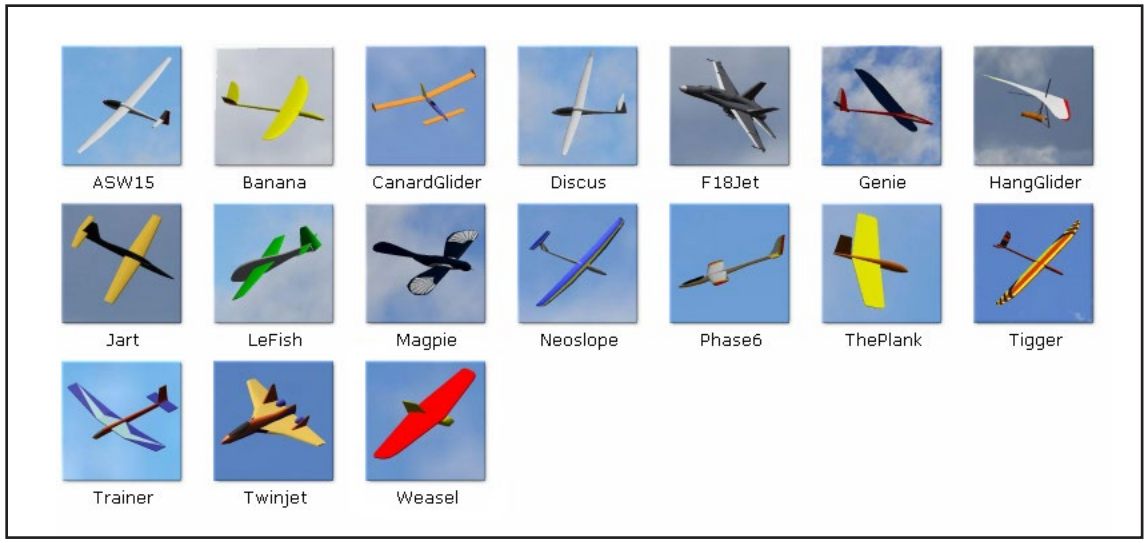
are used immediately. The gear logo in the lower right corner is used change aircraft, scenery, and other settings and parameters, and we'll start there.

Tapping the Gear logo brings up a screen with six buttons along the top - Options, Aeroplane, Scenery, Lighting, and Controller. (The Joystick button in the illustration does not appear in the iOS version we reviewed.)

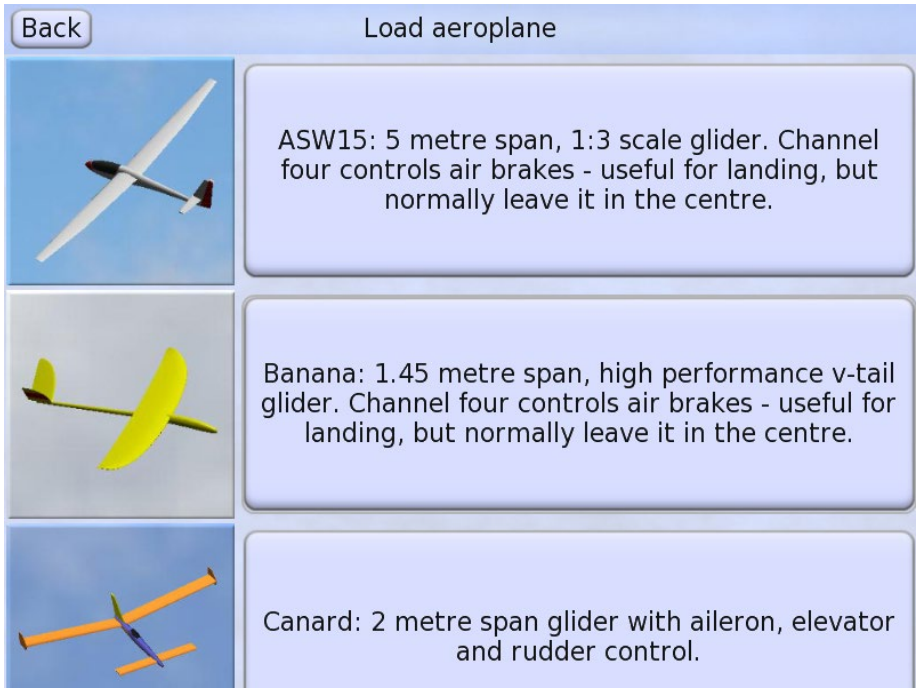
Each of those buttons opens a scrolling menu with various settings and parameters listed, along with a slider scale or check box. These menus include what can be considered "basic" settings. Advanced settings are also available for many of these. As an example of this, tapping the button Controller opens with simple sliders for trim settings. The Advanced screen includes the option of none, one or two sticks, aircraft control surfaces, and movement settings for each stick.

Danny has created a number of aircraft for this initial release of PicaSim (see the matrix at the top of the next page). This selection includes two powered craft, a full size hang glider, a bird, and 13 RC sailplanes of various types. The Trainer is the default choice until you have loaded an alternate.

The Advanced Aeroplane menu allows you to add ballast, increase drag and size, add a variometer, change the launch speed and angle, and manipuklate the chase camera settings.



Available aircraft for the current PicaSim release.



The scrolling list of available aircraft.

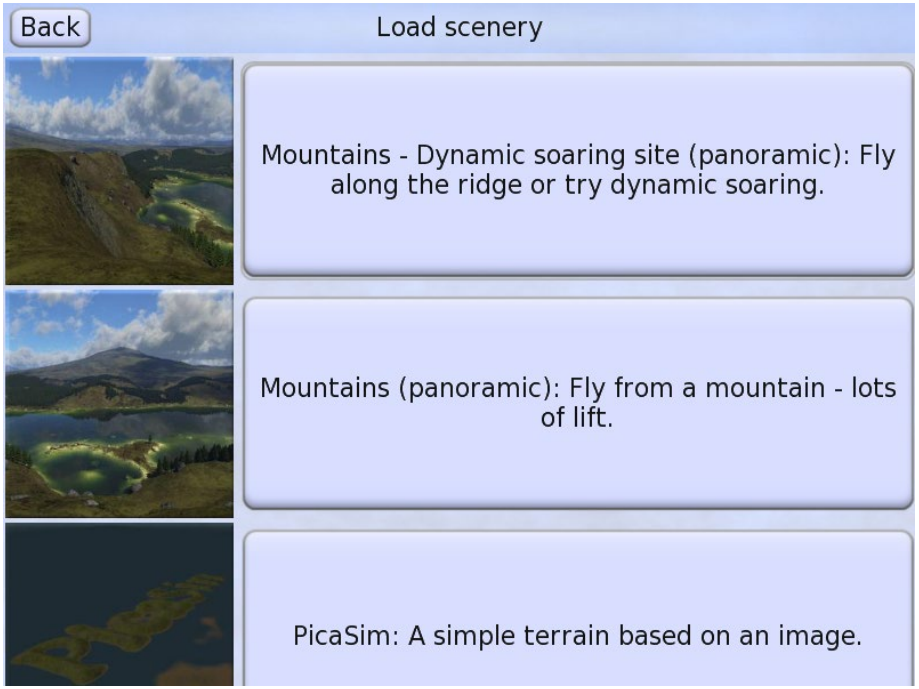
The entire PicaSim environment can be changed to suit your own personal taste.

Once flying, aircraft size depends on distance, but there are zoom settings and there is a small window in the upper left corner of the screen which shows the plane's orientation in a constant size. This is extremely beneficial when you are flying at a distance and the screen resolution cannot provide enough information.

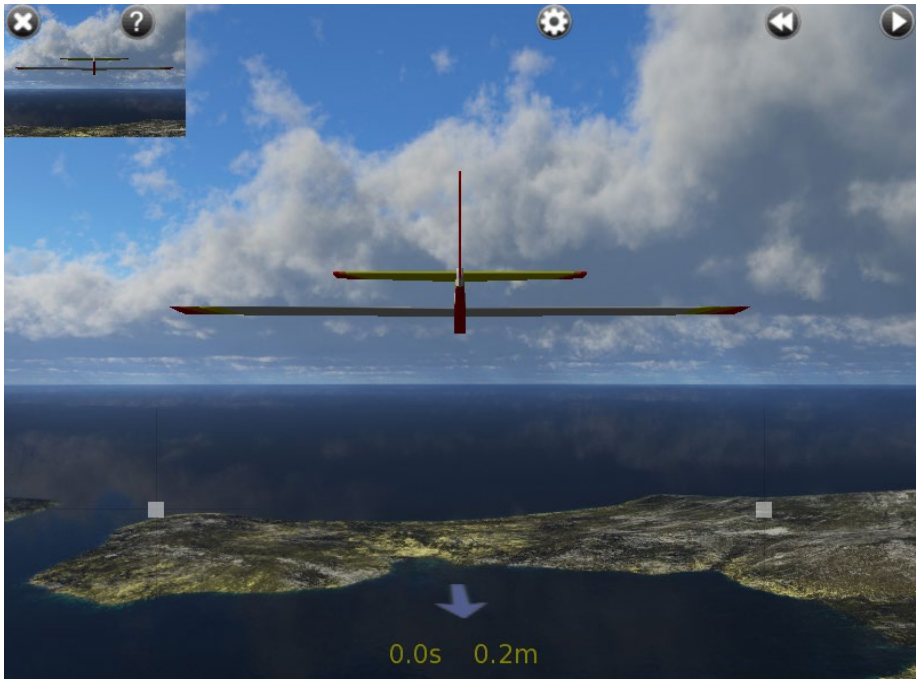
Options available to the user include wind direction and arrow size, time scaling, physics accuracy, the size and position of the "sticks" on the screen (by default these are small white squares located in the lower corners), wind noise volume, visible thermals, display of velocity, altitude and/or ascent rate, and the "beep" volume when racing. You can also adjust the position of the sun, thermal activity, and the darkness of the terrain. There's even an adjustable turbulence level, a good option for practicing slope soaring in adverse conditions.

Of the aircraft available, there were several which had surprises for us. The ASW 15 and Discus were very smooth flyers, the F-18 and Twinjet were surprisingly fast. The Dream-Flight Weasel was a real kick to carve around the slope. The LeFish is capable of some pretty extreme aerobatics, including knife-edge flight and tumbling. Of particular interest was the flying characteristics of The Plank. This aircraft embodies the planform we've been flying for the past 25 plus years and didn't disappoint. It's astounding how much of the feel of it short-coupling comes through in this iPad app. The Plank has a much different feel than say the Banana, and this comes through the virtual interface with obvious clarity.

The Race option is pretty cool and is as close to being "real" as is possible with a simulator. The demonstration video



The Scenery menu. There numerous options, including cliff, mountain, and flat land (with and without snow).



Press the arrow at the upper right of the Launch screen to start flying. "Sticks" and wind direction are easily seen here.

shows the racer turning just as the signal is heard, but as is evident is videos of F3F races, pilots make the turn so the aircraft just brushes the plane extending from the pylon. With practice, those leaderboard times can be beat.

Speaking of high speed flight, PicaSim can be set up dynamic soaring! Some of the Aeroplanes provided perform well, but we're extremely eager to see someone add the ThunderTaker or Kinetic 100v2 or something similar to the collection.

It should be noted that both the Android and Windows versions of PicaSim may not be compatible with all hardware. Some phones will not run the app, and some Windows hardware configurations may be problematic. Check the PicaSim forums for more specific information; there may be a note which applies to your situation.

There is a YouTube video showing how to hook up a transmitter on a Windows machine running PicaSim.

In all, PicaSim is a fantastic flight simulator – particularly on the iPad where after a short time it's like having a real transmitter in your hands – and Danny is sure to be making it even better over time, given user feedback.

PicaSim is free, or very nearly free – 99 cents for iOS, free or $3.21 for Android, $2.00 for Windows, yet has the quality, realism, and options of the much more expensive commercial offerings available.

Hard to beat that! Thanks, Danny

The Discus flying along a mountainside.

The Phase 6 turning into the wind.

Resources:

SSS information and download
<http://games.groups.yahoo.com/group/slope_soaring_sim/>

SSS YouTube video
<http://www.youtube.com/watch?v=ThV0ecTWJbw>

PicaSim information
<http://www.rowlhouse.co.uk/PicaSim/index.html>

Videos on the PicaSim web site
<http://www.rowlhouse.co.uk/PicaSim/information.html>

Overview of PicaSim capabilities video
<http://www.youtube.com/watch?v=Of8rtIoJOVY>

Le Fish in PicaSim video
<http://www.youtube.com/watch?v=llR-R-HdGfY>

Dynamic soaring in PicaSim video
<http://www.youtube.com/watch?v=Nim4PtlSQjw>

PicaSim F3F racing video
<http://www.youtube.com/watch?v=1snr3U_rfDU>

Setting up a controller in PicaSim video
<http://www.youtube.com/watch?v=f91szj4rFbk>

PicaSim download links
<http://www.rowlhouse.co.uk/PicaSim/download.html>

Finding Lift on a Cold Day

Larry Dunn, ledunn@centurytel.net

Don't let anyone tell you that you can't find lift on cold, nasty winter days. Today when I went out with my new Bubble Dancer. It was 39 degrees, dead calm, solid heavy overcast and light sprinkles. I was desperate, so I flew a couple of flights anyway and guess what? There was lift out there! I could have stayed up much longer on the first flight but it started to come down heavier so I brought it back and hit the spoilers. Of course, by the time I was down it quit raining, so I went back up and it started again! My transmitter was getting pretty wet so I called it a day.