Michael Richter shows off his brand new Alula (prototype #1) on the hillside behind his home. The maneuverability of the relatively small Alula makes it possible to fly around trees, shrubs and other obstacles in search of light lift.

On the ’Wing... #181

As regular readers of RCSD know, we wrote a kit review of Michael Richter’s Weasel and miniWeasel just over a year ago. We were impressed with the quality and completeness of the kit contents, the ease of construction, and the ruggedness and performance of the completed aircraft.

While writing the review, we were of course in contact with Michael Richter. In one piece of correspondence he included a photo of a test vehicle he had designed which sported forward swept wings and a fixed fin at the end of a long slender boom. Its rather unique planform intrigued us, and we encouraged Michael to put out a kit. (The photo appeared in the article.)

We’re eagerly awaiting the appearance of that design, but in the meantime Michael has developed another sloper with forward swept wings named Alula. Richter R/C’s spokesman, Steve Lange, placed some photos and a brief description of Alula on the <flyWeasel> Yahoo group, and we immediately contacted Steve in an effort to obtain more information.

Alula is a compact lightweight EPP foam machine with forward swept wings which excels at “slermal” (slope thermal) flying. The very light wing loading, maneuverability, and small size make it ideal for taking advantage of light lift conditions and tight spaces.

With that as background, we turn over this month’s edition of “On the ’Wing...” to guest author Steve Lange.

Photo above: The organic Alula silhouette contrasts beautifully with the overhead cloud base.

INSIDE THE RICHTER R/C SKUNKWORKS: PROJECT ALULA

by Steve Lange

One of the great things about living in the same town as Michael Richter is that you get to go over to his shop and take a peek at what he's working on. Usually he's busy filling Weasel-pro and miniWeasel orders (see RCSD 2/03 for details), but from time to time he gets a break in the action and a chance to do some R&D. That's when the REAL fun begins!

The latest creation to come out of the Richter R/C "skunkworks" is an ultralight tailless forward swept EPP glider named the Alula, scheduled for release in the early summer. If you consult your dictionary, you'll see that the word "alula" refers to the thumb feathers on the leading edge of a bird's wing. These feathers serve a similar function to the leading edge slats used on full size aircraft, helping to delay the onset of a stall and keep the airflow attached the wing surface. Given the impressive low speed performance of the Richter R/C Alula, this name suits Michael's newest glider perfectly.

The Alula is a classic example of a designer "scratching an itch." Michael enjoys flying small tip-launched gliders around his home in the foothills of Santa Barbara, where his backyard frequently enjoys a soft up-canyon breeze and small thermals. On the downside, there are tall trees and scrub brush everywhere, making retrieval of downed planes a non-trivial affair. Having a durable and highly maneuverable glider is of key importance when your landing pattern frequently involves a downwind approach beneath a tree branch, over a creosote bush and touchdown in an outstretched palm!

Happily, the same features that make the Alula an outstanding performer in Michael's backyard also make it great for ultralight slope lift and slermal (slope thermal) conditions at "normal" flying sites. The forward swept planform is incredibly agile, allowing the pilot to slow forward flight to nearly a walking pace without any fear of stalling. Steeply banked 180* turns can literally be done around a wingtip. It also makes for some of the prettiest thermal turns you're ever likely to see from an R/C glider; high in a thermal, the Alula looks much more like a small soaring bird than an airplane.

Photo above: On final approach, the Alula looks very bird-like. Slow speed behavior is exceptional.

Like the rest of Richter R/C's offerings, the Alula is made from EPP, with one major difference: except for the competition grade balsa elevons, it is not taped or covered in any way. Leaving the airframe uncovered results in two immediate benefits: the plane's all up weight is significantly reduced, and building time is cut by half or more. At the low Reynolds Numbers at which the 32" wingspan Alula operates, it is questionable whether or not the rough surface of the raw EPP actually inhibits performance; it may actually improve it. Since the plane is so light (3.5oz./100g AUW) durability remains good. My prototype has been flying regularly since the end of 2003 and it is still going strong.

This photo demonstrates some of the difficulties inherent to flying around Michael's house, especially if you have reflexes which are a bit slow. This Alula, one of Michael's prototypes, is still flying, and very well!

The Alula uses similar construction techniques to the Weasel-pro and miniWeasel. The wing halves are joined using Weldwood contact cement or 3M77, the carbon spars are installed using thin CA, and the servos are held in place with a dab of hot glue. The fin, a unique symmetrical design that extends both above and below the wing like the NCFM Bluto, is made from Depron and features its own carbon spar. As mentioned above, the elevons on my prototype are competition grade balsa and covered in packing tape (the production version may feature Depron elevons; the design is still being finalized).

Michael and I have been flying our prototypes using the same sub-micro gear that the miniWeasel employs. My prototype uses two Cirrus CS-5.4 servos, a Cirrus MRX-4 Mk.1 single conversion receiver, and one of Michael's 150mAh NiMH battery packs. With that setup the Alula can be flown continuously for a little over an hour. As mentioned, the AUW with this gear comes out to about 100g, which results in a wingloading of approximately 2.3oz./ft.^2 (7g/dm).

As most of our flying sites here in Santa Barbara feature hills of one sort or another, I have yet to test the Alula in truly flat field conditions. Tip launches are not exceptionally high, probably averaging about 40 feet. Obviously the Alula is not meant to compete with 1.5m handlaunch gliders; its forte lies in the ability to be flown in cramped locations where maneuverability and durability are key, as well as slermal and ultralight slope conditions. Low cost will be another

attractive feature; Michael has indicated the kit will most likely retail for less than US$50.00. That will make it less expensive than any other EPP SAL glider on the market with the exception of the miniWeasel.

Overall, I've been very impressed by the Alula's performance, and especially its durability. I expected the uncovered plane to be much more fragile, but so far it has held up to my abuse extremely well. The forward swept planform looks cool, and more importantly it works. I have yet to see anything that is as maneuverable and controllable at low speeds and in tight spaces as the Alula. It outclasses both the Weasel-pro and miniWeasel in this regard, and has definitely become one of my favorite airplanes. Hopefully, the Alula will meet the desires of the many Weasel-pro and miniWeasel owners who have been clamoring for a more thermal-oriented airplane. I know I'm satisfied!

Michael ready to launch his Alula on its maiden flight.
Because of its light wing loading and forward swept wing,
Alula excels in light “slermal” lift.

Alula Prototype #2 Specifications:

Wingspan: 32in. (813mm)
Wing Area: 217in.^2 (14dm)
All Up Weight: 3.5oz. (100g)
Wingloading: 2.3 oz./ft.^2 (7g/dm)

Links:

Richter R/C, Michael Richter
1250 Northridge Rd.
Santa Barbara, CA 93105
http://www.dream-flight.com/

flyWeasel Yahoo! Group:
http://groups.yahoo.com/group/flyWeasel/

Short Alula flight movie (2.5MB, Quicktime MOV format):
http://sbslopers.org/movies/alula/project_alula.mov

Steve Lange's plane, prototype #2, with some super-extra-custom Sharpie penwork providing the Alula "logo."