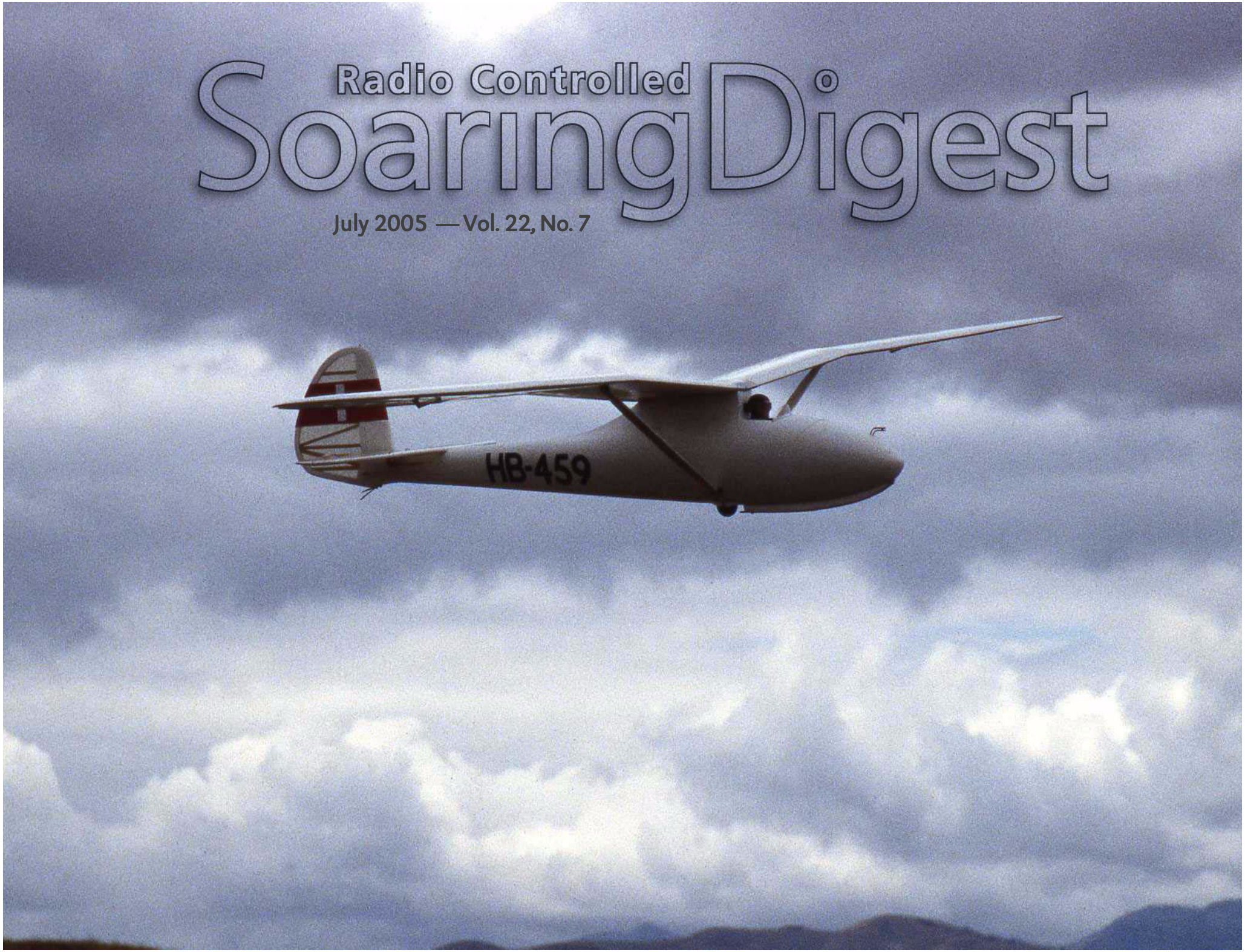
Radio Controlled Soaring Digest

July 2005 — Vol. 22, No. 7



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R/C Soaring Digest

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R/C Soaring Digest (RCSD) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January 1984. It is dedicated to sharing technical and educational information. All material contributed must be exclusive and original and not infringe upon the copyrights of others. It is the policy of RCSD to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of all articles are the opinion of the author and may not necessarily reflect those of RCSD. We encourage anyone who wishes to obtain additional information to contact the author.

This issue of *RC Soaring Digest* is a bit different than usual in that it incorporates a large amount of event coverage, and we hope this issue will provide motivation for readers to build and fly a scale model.

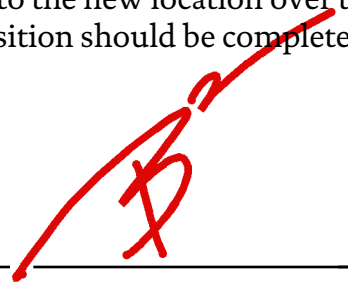
Don Bailey, Brian Chan, Ed Lockhart, Mark Nankivil, and Gregory Vasgerdsian (*Soaring High* columnist) all submitted photos for this issue. Choosing from this assemblage of more than 200 images was extremely difficult as we had so many fantastic images from which to choose.

On another front, our sincere thanks to everyone who has contributed to *RCSD* through the Donation button on the web site. As promised, we're using those contributions to improve the *RCSD* web presence.

As we write this editorial, we have completed two aspects of this long term internet project — *RCSD* now has its own domain name, **rcsoaringdigest.com**, and we've found a server to host the *RCSD* web site! Special thanks go to Dave Beardsley for his computer and internet expertise, for providing the necessary server accommodations, and for uploading the *RCSD* PDF archive for us.

We'll be transferring web pages and files from the *RCSD* portion of our b2streamlines.com domain to the new location over the next few days and weeks. The transition should be complete in time for the August issue.

Time to fly!



2005 JR Aerotow

Mark Nankivil, <nankivil@covad.net>

June in the Midwest means it's time to get packed up and on the road to Central Illinois for the JR Aerotow.

This is the third year the event has been held, each time at the Monticello/Piatt County Airport located on the south side of the beautiful town of Monticello which itself is located approximately 30 miles west of Champaign-Urbana in Central Illinois.

Monticello is surrounded by beautiful farmland and has a vibrant small town flavor to it. There's plenty for the family to check out and enjoy in town while the rest of us are out at the airport flying, seeing old friends and making new ones throughout the weekend.

Sponsored this year by Horizon Hobbies, JR, Sage Air and the Illini Glider Club, the JR Aerotow had a record 68 pilots registered for the event with many of these modelers bringing more than one model with them.

The Horizon Hobby Team was kept busy all weekend long towing scale sailplanes throughout the day. Also new this year was a scale sailplane cross country event.

Many in attendance also took advantage of soaring themselves as the Illini Glider Club offered sailplane rides in one of their Schweizer 2-33 sailplanes.

A BBQ Dinner was available on site Saturday night which made a fun setting for the raffling off of the many goodies donated by the event sponsors, with a JR XP9303 radio, various models and other goods, most everyone came away with something to enjoy and use.

The JR Aerotow is a go again in 2006 so be sure to leave your weekend's free in June and come join in on the fun!

Opposite: Andrew Jamieson's 1/4 scale Graupner *Twin Astir* being towed by Johnny Berlin's *Pegasus*. **Above:** A portion of the pit area on Saturday. Many also took advantage of the space in the hangar to keep and store their models throughout the weekend. All photographs by Mark Nankivil.

Clockwise from upper left: Peter Goldsmith's Piper *Pawnee* from the Bruckmann kit Ren DiLeo of San Diego California brought his scratchbuilt 1/4 scale Schweizer 1-26E. Andrew Jamieson's 1/4 scale Graupner *Twin Astir* being towed by Johnny Berlin's *Pegasus*. One of the sleek "glass slippers" in attendance.

Howard Keller of Greenville South Carolina brought his two year old ASH-26E to the event. From the LET kit, it spans 6 meters at 1/3rd scale and weighs in at approx. 25 lbs.

Opposite page: Tom Scully of Cadiz Kentucky flew this 1/4 scale Ka-8B built from the Flair kit.

Right: Jim Porter of Des Moines Iowa brought along this 5.4 meter span DFS *Reiher II* finished as a U.S. registered ship. This is from the LET kit and spans 5.4 meters.

Below: Rusty Rood brought his 40% scale, six meter span ASW-15 from the Fleckstein kit.

Opposite page: Scale model or full size? This is a 1/3rd scale ASH-26 circling in a thermal. Realism is the hallmark of scale aerotowing. **Above left:** The beautiful wood veneer wing stands out on this Mueller 6 meter span ASK-18 owned by Angelo Orona of San Diego California. **Above right:** There were two of these discontinued 2.9 meter span Graupner *Minimoas* flying at the event. Considered by some to be on the small size for aerotow, both of these models flew often and flew well in the somewhat blustery conditions.

Clockwise from upper right: The Illini Glider Club had rides available in this Schweizer 2-33 throughout the weekend. A number of the participants took advantage of the opportunity to check out the local soaring conditions. This 30% scale Grunau *Baby II* shows off its translucent covering even on a cloudy Friday at the event. This DAW Ka6E was modified to incorporate flaps. This is an excellent model to learn aerotowing with and in turn you have a fun model for thermal and slope flying as well. The kit is now available through Sky King R/C Products <http://www.skykingrcproducts.com>. Peter Goldsmith's *Super Cub* towplane was one of five towplanes in use throughout the event. Pilots usually did not have long to wait for a tow. Richard Ransom with his ASH26 from the Schueler kit - 1/3rd scale and 26 lbs.


N5707S


N5707S


N5707S


D-6249

A 1.3 scale ASH-26 passes overhead, sun gleaming off the fuselage.

Correction to Gregory Vasgerdsian's April 2005 "Soaring High" column:

I wanted to correct a few words from my last column in regards to the manufacturer of the SuperHawk. Brian Joder of the HobieHawk.com website pointed out to me that the SuperHawk is built not by Ross Models but by Tony Johnson up in the Seattle area. The Super Hawk is made with all handmade tooling of Tony's own design, while the only common/original part used is the molded dorsal piece which is obtained from Ross Models.

Gregory

FAI has ratified the following Class F (Model Aircraft) records:

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Claim number: 9950
Sub-class F5-S (Aeroplane, electric motor (rechargeable sources of current))
F5: Radio Controlled Flight Category
Type of record: N°174: Distance to goal and return
Course/location: Jacksonville, FL (USA) - St. Augustine and return
Performance: 68.9 km
Pilot: Giorgio AZZALIN (USA)
Date: 06.11.2004
Previous record: 54.30 km (04.07.2004 - Raymond COOPER, Australia)

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FAI congratulates the pilot on his splendid achievement.

Scale Soaring Medal Achievement Program

Sponsored by Scalesoaring.net

In keeping with the theme of a couple of the major articles in this issue, we're providing information on a soaring award program sponsored by John Derstine/Endless Mountain Models. Instituted in 2004, the program is now going strong.

The Scale Soaring Medal Achievement Program is to be considered a friendly competition with emphasis placed on bettering one's personal achievement. The tasks are not easy, but designed to represent meaningful accomplishment in scale soaring duration. Rules are determined by Scalesoaring.net as follows:

Awards: one medal per pilot per event.
For one 35 minute flight you receive a bronze medal,
for one 50 minute flight you receive a silver medal, and
for one 70 minute flight you receive a gold medal.

The pilot who earns three gold medals in separate events, not limited to one flying season, will be awarded a Diamond level plaque with his or her name engraved on it. In addition, Diamond level recipients will be eligible for 15% discount certificates on any Endless Mountain Models product. It is hoped that other suppliers and manufacturers will support this event in the future with their donations.

Modifications in the written rules: Procedure changes are published at the beginning of each flying season, February. The sponsor, Scalesoaring.net, reserves the right to modify rules. See <http://www.scalesoaring.net/EMM/scalesoaringgold.htm> for more information and up to date rules.

The 13th Annual

Los Banos Scale Fun Fly 2005

Coverage by Gregory Vasgerdsian
Photos by Ed Lockhart and Gregory Vasgerdsian

John Dvorak gives his nice 1/5-scale TG-2 a toss from the slope. Built from the *Model Airplane News* plan it spans 120-inches. John built this model in 1984! If you want to get into scale without spending a fortune, this is one glider that won't disappoint with its excellent flight characteristics. Photograph by Gregory Vasgerdsian. **Opposite:** Ahh, the beauty of vintage glider wing ribs when the sky lights them up from above. Photograph by Ed Lockhart.

Last May I once again had the pleasure of stopping in at the SBSS Scale Fun Fly. You know, if there's an event that feels like you' re visiting your favorite coffee shop the Los Banos Scale Soaring event is it. Friendly people, good food and good conversation — in short an enjoyable place to be. Like many, this is an event that started with just a handful of guys who'd meet in late spring to fly scale ships on the slopes of Los Banos Reservoir. Over the years it has waxed and waned in turnout and this year it was a real delight to attend. Now, how does that go? Oh, "It's the people that make the party", and this year the event really settled into a comfortable groove with a great mix of scale soaring enthusiasts and a well-structured field layout. The organizers set up a distinct "tow-zone" and landing strip that was separate from the slope and the "slope landing zone," and this made flying a pleasurable and relaxed affair. Slope lift, aerotow or winch, the 2005 event had all options available.

Lynsel Miller, Bruce DeVisser, Brian Chan and other members of the SBSS put a lot of effort into getting it all set up - thanks guys! Weather was a mixed bag with rain on Friday that pretty much washed things out while Saturday saw broken skies and plenty of thermals by 11:00 am. Unfortunately, towing tugs were few and this did put a bit of a damper on things. However, on Sunday the tugs weren't even needed as the wind came up early and pumped solid lift until dark... as usual Sunday was the best day for flying!

Gene Sorano launches this 1/3-scale Krause *Salto* owned by Ken Kaye of San Juan Capistrano. The Krause *Salto* is known for excellent handling and flies very well in light lift. Gene took the pilot's choice award in modern with his Schuler ASH-26. Photograph by Ed Lockhart.

Clockwise from upper left: Great looking Schweizer 1-26 built by Ren DiLeo at 1/4-scale. Photograph by Gregory Vasgerdsian A close look at Willy Grundler's SG-38. Lots of turnbuckles and rigging wire make it a little time consuming to assemble at the field, but what a sight when it is in the air! Photograph by Gregory Vasgerdsian A nice looking *Bergfalke* most likely built from the Traplet Publishing plan. Photograph by Ed Lockhart A close look at the front end of Brian Chan's 1/4-scale Kirby *Kite*. Photograph by Gregory Vasgerdsian.

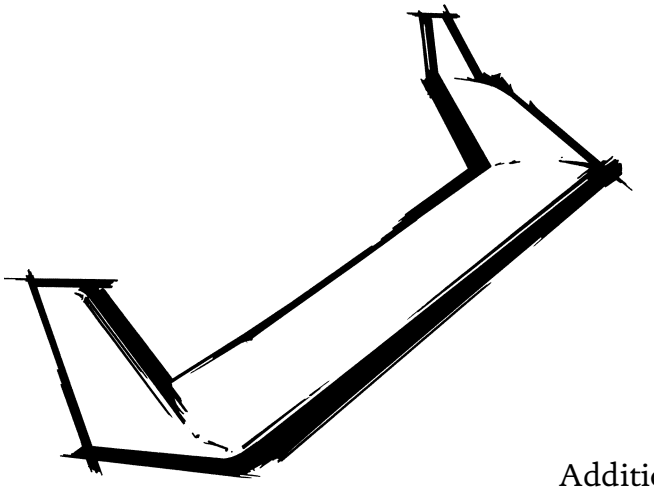
Willy Grundler's 1/4-scale SG-38 cruises by while Ren DiLeo's 1/4-scale SGS-1-26 flies in the background. The SG-38 is a Krick kit while Ren's is a one-off EPP ship. Photograph by Ed Lockhart.

ASW-15 with gear down and headed for earth. Photograph by Ed Lockhart
A close look at the cockpit of Brian Laird's DG-1000 *Elan* and the front end of Tim Neja's SB-9 by Valenta Models. Stunning! Photographs by Gregory Vasgerdsian.

Clockwise from upper right: This Bowlus *Albatross* and *Bergfalke* were hard to miss in their attractive and bright colors. The winning model in Vintage was this DFS230 German military glider. With plenty of stringers running down the fuselage John Dvorak's TG-2 is another beauty. Lynsel Miller's TG-3 is one colorful ship, and although it has been photographed many times over the years it is always great to see again! All photographs on this page by John Dvorak.

Five meters of SB-9 soar across the slope. This high-aspect-ratio beauty of Tim Neja could really cover ground and did well in light lift. However, Brian Laird's DG-1000 appeared to hold more altitude in the same air. Photograph by Ed Lockhart.

Lynsel Miller's TG-3 ranging out at sunset. Photograph by Brian Chan.



On the 'Wing...

Bill & Bunny Kuhlman, <bsquared@themacisp.net>

Construction and preliminary test flying of our second Alula *is now complete.*

Before we talk about the test flying and compare this new 'ship, *Alula2*, with the earlier version, we'll go over the last of the fine points of the construction process.

Completing Construction

Spray adhesive Rather than 3M-77, we used Clearco 877 Adhesive Spray, an aerosol adhesive which does not use acetone in its formulation. We'd heard that Clearco 877 has a longer working time than 3M-77, but we didn't notice any difference in that regard.

Additionally, we found Clearco 877 to be noticeably less tacky than 3M-77, and the tape covering does not seem to stick nearly so well.

Also, the Clearco 877 does not seem to respond to low heat like 3M-77 does. That is, the adhesion is not reactivated to the same extent.

Hinge tape We initially used a medical tape to hinge the control surfaces, rather than the specially selected Scotch tape (Extra Strength Crystal Clear, 34-8505-5627-4) we've used before. This medical tape is much more stretchable and seems "soft" across the hinge line. While it sticks extremely well, it does not seem to hold the control surface in place as firmly. After initial test flying, the medical tape was replaced with the Scotch brand we've used previously.

Elevator system Because the elevator halves are driven by a single servo through a split pushrod, there was need for only one pushrod channel in the fuselage bottom. We made this a little wider than needed so it's right on the fuselage centerline.

As expected, the elevator differential is extremely small, not easily discernible to the eye and certainly not noticeable in flight.

Miscellaneous The control surfaces span the entire 17.25 inches of the trailing edge. Our *Alula2* has the inner 6.5 inches devoted to elevator, the remainder to aileron. The elevator span is therefore 13 inches, and each aileron spans 10.75 inches. There was no math involved in this proportioning, just what looked good when we made the decision.

All three servos were wedged into close-cut sockets and then securely held in place with small dots of Goop. We did not remove any mounting tabs, instead inserting them into appropriately placed slots in the foam.

Rather than using tape covering on the sheet balsa control surfaces, we opted to simply put on a coat of dope. This does not add much strength to the balsa, but it does make it resistant to moisture. We're toying with the idea of cutting slots at 90 degrees to the grain and inserting small pieces of hardwood to improve durability.

This EPP construction project is our first to incorporate Goop "paint" as the fuselage finish

Catching the *Alula2* after a flight and getting ready for another toss into the skies above 60 Acres. The smile says it all. Photos by Brian Kloft.

instead of an iron-on covering material. This method of finishing EPP foam was presented in the February 2003 issue of *RC Soaring Digest* in Gordy Stahl's "Gordy's Travels" column.

Our methodology is a bit different than that presented by Gordy. We used toluene to thin the Goop, starting with a very watery consistency and making each subsequent coat slightly thicker.

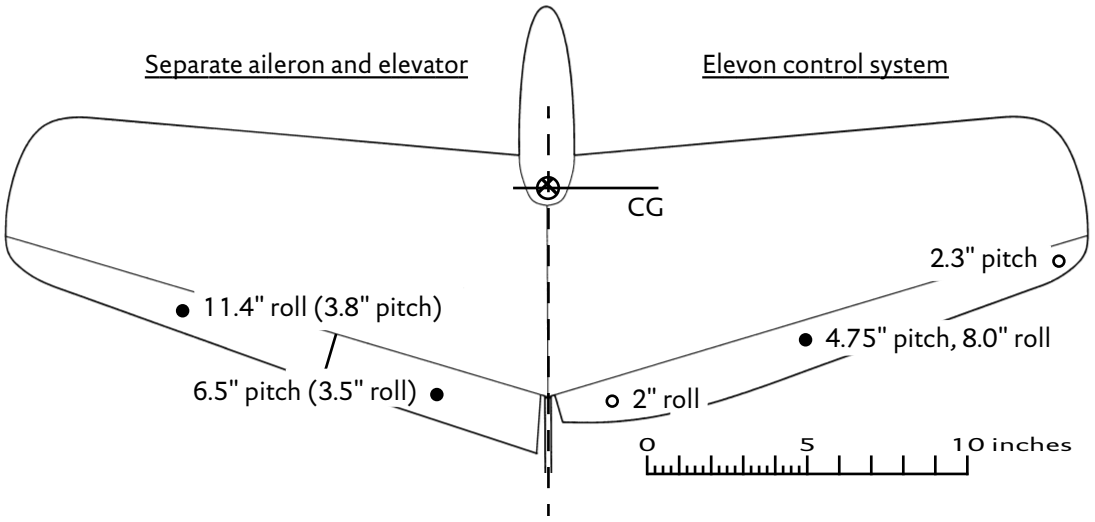
In all we applied eight coats at the front end and five coats at the rear. The thin initial coats filled the pores of the foam, while the coats of thicker consistency built up a rigid shell.

Once all of the painted layers dried, we put the airframe back on the balance stand. Three grams of lead were removed from the nose to keep the CG in the proper location. The overall aircraft weight remained at 4.8 ounces.

Test flying

CG location Our balance stand was put to use in order to get the CG correctly located. Michael Richter's instructions recommend the CG be at 25 mm behind the leading edge at the wing-fuselage junction. Initial tosses were performed with this CG location.

The trick to trimming the *Alula* is in balancing the CG location with the absolute minimum of reflex in the control surfaces. Ideally, the aircraft should travel in a nearly straight trajectory after launch and until momentary



Control surface leverage in pitch and roll

Since the *Alula* control surface hinge line sweeps forward, it is aerodynamically advantageous to separate the elevator and aileron functions.

Separating the control surfaces creates a larger lever arm for the elevator in pitch and for the ailerons in roll.

The elevon configuration creates excess drag with roll input as the inner portion of the surface has little leverage. The outer portion of the elevon is relatively ineffective in pitch because it lies so close to the CG.

As points of comparison, note in the table below the deflections of the control surfaces versus their relative areas.

Alula Versions Comparison

	Richter R/C Kit	*Alula*	*Alula2*	Jason Brinley's *Alula*
Control surfaces	Elevons	Elevons	Elevator & ailerons	Elevons
Aileron span (hinge)	44 cm, 17.25"	44 cm, 17.25"	27.25 cm, 10.75",	44 cm, 17.25"
Elevator span (hinge)	44 cm, 17.25"	44 cm, 17.25"	16.5 cm, 6.5"	44 cm, 17.25"
Servos	2 x Cirrus 5.4	2 x HS-50	2 x HS-50, 1 x HS-55	2 x Cirrus 6.2
Weight	119-130 g, 4.2-4.6 oz	127 g, 4.5 oz	136 g, 4.8 oz	122g, 4.3 oz
Wing loading	2.6-2.8 oz/ft^2	2.8 oz/ft^2	2.9 oz/ft^2	2.6 oz/ft^2
Elevator deflection	4-5 mm, $^1/_8$-$^3/_{16}$"*	5 mm, $^3/_{16}$"*	5 mm, $^3/_{16}$"* up, 4 mm, $^1/_8$"* down	7 mm, $^1/_2$"* with expo
Aileron deflection	10-12 mm, $^3/_8$-$^1/_2$"*	12 mm, $^1/_2$"*	10 mm, $^3/_8$"*	12 mm, $^1/_2$"* with expo

* These English System measurements are approximate; the associated metric values are more accurate.

down elevator is given at the top of the climb to level out.

If the CG is even slightly forward, excess reflex is required to offset the nose heavy condition. On launch, the aerodynamic force generated by the reflex causes the aircraft to pitch upward.

If the CG is slightly too far to the rear, the aircraft will pitch downward on launch and be extremely pitch sensitive.

The line between reasonable sensitivity and downright uncontrollability is very fine one on an airplane this small.

Transmitter programming Our PCM 10 transmitter was set up so that channel 2 (aileron) controls the right aileron and channel 4 (rudder) controls the left aileron. Mix 1 puts channel 2 into channel 4, and Mix 2 puts channel 4 into channel 2. Channel 3 (elevator) controls the elevator alone, as would be expected.

This setup allows the right stick to control both aileron and elevator functions, while the left stick can be used to control the ailerons alone if desired. (See the part about post-launch vertical rolls later on in this article.)

Rather than make the Mix trims active, we left those settings on INH (inhibit). With this setting we can adjust the neutral of either aileron independently from the other.

Alula2 is currently flying with the ailerons exactly lined up with the elevator. Launches have just a hint of a climb, and it can cover a surprising distance with good cruise speed and a low sink rate.

Control throws Our original *Alula* uses the recommended elevon control throws — elevator 4-5 mm total, aileron 10-12 mm total. *Alula2* can use elevator throws 5-7 mm up and 4-5 mm down; aileron throws can be set for 5 mm to 10 mm with no differential. We usually fly with the lower elevator setting and a middle aileron setting which gives 7 mm travel up and down.

This means we're using the same elevator deflection and slightly less aileron deflection than recommended for the elevon version.

Launching Progressing from light hand toss to full power SAL took only a few trim clicks on the transmitter and no change in CG location.

Comparisons So, how does this modified *Alula* fly? In a word, "Fantastic!"

We now have over 400 flights on the airframe, and it's been piloted by an ever growing number of fellow SASS members as well as ourselves.

The roll rate is fairly rapid, but is still fine enough that four point rolls are possible.

In an impromptu "contest," pilots found two vertical rolls after launch to be pretty easy, three somewhat difficult but not impossible. With a true discus throw (the kind where all of the blood in your arm goes to your hand) we're fairly sure you could get four.

Our first *Alula* has the tendency to run out of elevator authority as the angle of attack increases. When this happens, the nose drops slightly and any turn quickly straightens out. The aircraft then drops down at about a 30 degree angle with the fuselage about level with the ground.

It is also possible to apply a little less up elevator and witness a rapid bobbing in pitch due to stall hysteresis.

The *Alula2* behaves in similar fashion, but everything happens in a much more predictable manner. Major differences? *Alula2* flies more smoothly and has better "legs" when covering distance.

Jason Brinley, a fellow SASS member, had just completed his *Alula* when we met with him at 60 Acres. Jason uses two servos which drive full span elevons, as per standard practice. He was having a grand time with his 4.3 ounce *Alula*, flip-flopping it around like a 3-D electric, doing pylon racing turns around willing collaborators, and pretty much having more fun than anyone is entitled to have with a $50 foamie.

We let him fly our *Alula2* and he was pleasantly surprised. While it won't do all of the fancy (and sometimes erratic) maneuvers his is capable of performing, Jason says it's a smooth flying airplane in comparison to his and will be a great thermal machine.

When flown together, Jason's is very slightly slower and has a barely noticeable better sink rate. Both of these characteristics are to be expected because of the slight weight difference and resulting wing loadings.

Dave Beardsley, who has flown all manner of sailplanes, electrics, helicopters and aerobatic aircraft, definitely prefers the *Alula2*, with its separate control surfaces, to the elevon version. He says it is far better in the areas of predictability and efficiency.

Long term wear and tear issues Our original *Alula* now has several hundred flights on it, and the tail began slipping out by a very small fraction of an inch on each launch. The tail boom flexes quite a bit on launch, so this is probably a matter of the boom "walking" out of the Coroplast socket.

This potential problem was virtually cured by rubbing bees wax on the carbon rods. This provides just the right amount of stickiness to prevent the slipping, but it doesn't at all affect removal of the tail for transport.

The Goop paint treatment has done an excellent job of protecting the fuselage. Gordy's article points out that one of the initial layers can be painted or covered, and then clear Goop applied over the colored layer. We'd like to hear from anyone who has a method for actually coloring the thinned Goop, particularly if the coloring can be transparent.

Still experimenting One trick we've been fooling is the use of the Snap Roll button on the transmitter during the initial climb phase after release. When the Snap Roll button is depressed, the ailerons are set for zero deflection and the elevator is set to 8% down. This gives an absolutely straight trajectory until the button is released.

Conclusions As you can probably tell, we LOVE this airplane! While the elevon version flies extremely well, we feel the three servo option, with separate aileron and elevators functions, is both a viable and exciting alternative, especially if you're a flat land flyer who wants to explore small newly formed thermals rather than perform megaradical maneuvers on the slope. The three servo version, by all accounts from those who've flown it, is noticeably more efficient while maintaining essentially the same maneuverability.

An *Alula* kit is $45 plus $5.50 packaging and shipping from Michael Richter at Richter R/C, <http://www.dream-flight.com>. If you plan to build a three servo version, make sure you order a second hardware set, too.

The kit itself is quite complete, with all necessary hardware included. Missing are tape, adhesives, and color. All you have to do is construct the airframe and add your own servos, receiver, and battery pack.

We do suggest you purchase a roll of covering tape along with the kit, however, as finding a roll of suitable lightweight tape on your own can be quite time consuming.

If you want to see the standard *Alula* in severe action, and in some interesting slope soaring environments, go to <http://www.lavawing.com> and download the "Pop Fly" QuickTime movie. This is a large file (17.6 MB), but it's well worth the download time required if you're on dial-up like we are.

Brian Kloft recently visited the Seattle area on a business trip and spent several Wednesday evenings at 60 Acres. Brian was able to use his digital still camera in movie mode and capture some video of our *Alula2* flying under the dark skies present at the time.

We've placed one of these videos (MPG) on the *RCSD* web site. Look for a link on the *RCSD* home page and on the highlights page.

Is it possible to have too much fun with an *Alula*? We certainly don't think so.

Don Bailey

Aerotowing!

Ted Hendrickson's Hall *Cherokee* prepares for take-off. Look at that nice runway!

Yakima Spring Warm-Up, May 7th-8th

I had already maidened my *Minimoa* at Yakima in eastern Washington two weekends before, in some of the strongest lift I have ever experienced. All that open prairie and hot sun really churns up the lift. We fly off a grass landing strip, on George Glessner's homestead, which sits on top of a long bluff just outside of Union Gap.

Gene Cope calls it "Disappointment Field." Don't be fooled! The lift here can suck the paint right off a good pair of wings, and you can easily find yourself praying the spoilers don't tear away in your terminal dive out of a boomer.

We had a good handful of new and not-so-new pilots in attendance on Saturday, May 7th. I performed the maiden flight on my new 3.4m S2G *Minimoa*, and soon found myself relaxing in a chair, and flying the *'Moa* between billowing cumulus clouds in the open sky while daydreaming about nothing.

Fred China brought out his brand-new Spalinger 15 for the first time, and it flew beautifully, which was a surprise to no one. It sure looked pretty up there against that desert blue sky, with the sun shining through the clear-doped wings.

Harold Ochs showed up with his 3.4m Krick *Minimoa*, and he and I had a good time comparing our two identically-sized *Minimoas*. While mine is an ARF kit, which I built in three days, Harold had to build his model piece-by-piece over the period of almost a year. The decidedly better scale detailing of Harold's *Minimoa*, however, was immediately apparent.

Ted Hendrickson performed a maiden flight on not one, but two, models: his new Hall *Cherokee II*, and a newly-finished Flair Ka8b. Both flew fine without any need for adjustments.

I had to leave to get back for Mother's Day, so I couldn't stay and fly on Sunday, but I hear it was also a great day of flying.

Upper: My S2G *Minimoa* reposes in front of Harold Ochs' Krick *Minimoa,* waiting for the next tow. **Lower:** Fred China prepares his Spalinger 15 for its maiden flight at Yakima

Left: Ready for take-off, the big Cmelak is prepared to tow an awful lot of airframe weight and drag, with two sailplanes on the line!
Right: An aerotow first! Three airplanes in a "train tow," all three have cameras mounted on them.

The Spring Warm-Up is supposed to usher in the start of the aerotow season in the Northwest region, but most of the time it ends up being the best event of the year for thermals—though I don't doubt the big September end-of-season event will also be a great time at "Disappointment Field." Put that one on your calendar for September 9-11th, if you can. You won't be disappointed!

Mission Aerotow, May 20th-22nd

The early morning drive from Seattle to British Columbia was a mixture of clouds and drizzle, with brief bursts of warm sunshine piercing through to the lush valley floor. I opened my thermos of hot coffee, and punched through all the radio buttons, searching for local forecasts. Looking out ahead to the north, I tried to see what the weather was doing on the other side of the Canadian border.

By the time I got into Mission, it was cloudy and dry. Winding along the highway that follows the shoreline of the Fraser River, I could see a large break in the weather up ahead, and by the time I pulled into Anderson's Sod Farm and parked among the line-up of cars and vans, I could tell it was shaping up to be a beautiful day of flying.

There was already a good crowd of guys setting up their sailplanes by the time I arrived. Everyone crowed about how hard it had rained the day before. Apparently, only one tug and a few sailplanes had gotten a flight in before the black mass of cold rain and hail crashed down on the gathering. I didn't feel so bad about having to work that day.

However, this day, Saturday May 21st, was becoming sunny and nice, with light breezes and good lift developing in all quadrants. I could hardly set up my small fleet of sailplanes fast enough.

Fred China is the host of the Mission Aerotow event, which has been an annual event for over five years now. Fred is a native Canadian, from Vancouver, and he is a master craftsman in the field of vintage, all-wood sailplane models, having churned out nearly a dozen original designs built from 3-views. He brought his newest creation, a quarter-scale Spalinger 15, which had made its debut at the Yakima Spring Warm-up two weeks earlier. Among Fred's fleet of beautifully hand-crafted vintage sailplane renditions are the Slingsby *Falcon*, the *Profesor*, the *Karakan*, the *Nemere*, the Avia 41P, the Polish CW-5, the Slingsby T-35 *Austral*, and the Slingsby *Kirby Kite*; each one with its own foam-lined plywood carrying box. Fred's easy-going personality set the tone for a laid-back, enjoyable event, with lots of flying and socializing, and plenty of lift for everyone.

Frank Smith showed up with his most recent project—a quarter-scale Schweizer TG-2 in Army primary colors. It had a pronounced low-frequency aileron flutter, attributed to excessive play in the linkages, so the maiden flight was cut short. It is a nicely crafted model, and once Frank resolves the linkage problem, the big TG-2 will be a real success.

Steve Dentz and Arend Borst get ready for Arend's first ever aerotow.

Bob Craig got the credit for the longest flight, of just over one hour, with his 4.2m Rodel ASK21. Erik Eiche was there with his gorgeous *Senior Albatross*, plus his *Kranich* and his enormous OBS glider, each one exhibiting impeccable scale detail.

Ted Hendrickson brought his new Hall *Cherokee II*, built from the Dave Smith plan, and though it ended up in a tree after a frequency pin mishap, it was retrieved the following day, none the worse for the wear. Dave Smith came all the way from his temporary job assignment in Italy to fly his Krick Grunau *Baby* and his new 3.7m HF DG1000. Dave was gracious enough to let me fly his DG1000, and true to form, Dave had it dialed in perfectly on its first day out.

Clockwise from upper left: Erik Eiche's huge OBS glider waits for the next flight. Note camera platform on wing strut. Frank Smith's nicely done 1/4 scale TG-2. Flightline set-up area, lots of beautiful sailplanes to see. Bob Marchi sets up his big 40% Pilatus B-4.

Dan Borg did most of the towing with Gene Cope's *Mule* towplane, with Gene Cope as a relief pilot. Steve Dentz brought his amazing Airworld *Cmelak* tug, with the big 5-cylinder RCS 215 radial engine in the nose. That 13.5 horsepower engine can haul just about anything behind it, and to prove the point, a "train" tow was performed on Sunday, with the giant 30-lb. OBS being towed behind the *Cmelak*, and a *Lovesong* camera glider being towed up behind the OBS.

This is the first time I have ever seen this done—it may be a first in the hobby for all I know. Arend Borst did the job of flying the *Lovesong* at the tail end of the chain. It was his first time ever at aerotowing, and he did just fine, which is what you might expect from a World Champion F3J pilot.

That camera glider was there for a reason. Erik's son, Michael Eiche, was at the event, taping digital video cameras to all the tugs, the OBS, and the *Lovesong* camera glider. Michael also had an assistant with a tripod-mounted video camera, who took lots of footage of the action from the ground, including the chatter of the pilots while they were flying. Michael is planning on making a short DVD movie of the aerotowing scene, and from the looks of it, it should be really good.

Sunday turned windy and cold by afternoon, but I managed to get a few good flights in during the morning hours with my new S2G *Minimoa*, and Dave Tanner and I had a good time flying our matching Flair Ka8b gliders in the same thermals.

When you live in the Pacific Northwest, one good, full day of flying in the spring months is considered a huge success!

Dave Smith's 3.7m HF DG1000.

The Tool Room

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HiPURformer™ Polyurethane Bonding System

Recently I decided to build a DAW* EPP Ka6 sailplane for an upcoming flying vacation in Switzerland. Flying in the Swiss Alps is a fantastic experience, one not to be missed. However, landings are a real challenge. A typical approach is downwind to the uphill side of a mountain slope. And that's a fast downwind approach as the air is thinner at 4000-5000 feet and planes move a lot quicker.

If your timing is less than perfect, you wind up flying right past your LZ or worse... burying a small hole in it with your shiny pride and joy. This year I'm determined to master the fine art of landing in the mountains and figure an EPP sailplane should survive long enough for me to acquire some basic skills.

The first step in completing the Ka6 was to glue wood spars in the slots of the EPP wing panels. The instructions recommended using hot melt glue. I was a

The components of the HiPURformer™ Polyurethane Bonding System: heater base, applicator, hot melt MP75 polyurethane glue cartridge.

bit skeptical as my past impressions of hot melt glues were not very positive.

After a bit of research, I stumbled upon a relatively new hybrid glue that combines the convenience of hot melt with the adhesive qualities of polyurethane glue but with none of its downsides. It's called the HiPURformer™ Polyurethane Bonding System. The glue is made by Franklin International (think Titebond®). The gun is made by Steinel®, a well known German manufacturer.

My experience using this hybrid system has been very positive. Unlike hot melts of the past, this new glue has a very generous open working time before it sets up. The MP75 glue formula I choose has an open time of about 75 seconds, has a medium viscosity, bonds a wide variety of dissimilar materials with a strength of 900 psi after 24 hours.

Once the glue cools and sets up, the polyurethane begins to react to moisture in the air, cross-links and strengthens. According the literature, this process takes anywhere from several hours to several days. The bond strength increases dramatically over time. However, unlike most pourable polyurethanes like Gorilla Glue, there is no foaming mess to contend with.

What impressed me most is the tremendous *flexible* strength of this glue. Once cured, it was next to impossible to remove from the wood spars short of grinding it off. It clings tenaciously in a manner similar to Goop or PFM but never lets go. I can't think of a better glue to use on a material like EPP where you want great penetration and flexible strength.

I also ran some brief wood to wood glue tests. The resulting adhesive bonds are amazingly strong and the working time of

about a minute gives you the opportunity to align the pieces precisely, then hold them briefly until the glue sets up hard enough to release clamping pressure.

I believe this glue system could be useful in traditional kit construction, especially with hardwood and plywood parts that usually require slow curing epoxies. It might also be useful to tack glue hardwood parts, then follow-up with a more traditional glue once the framework is aligned and assembled.

Another potential application is applying thin plywood skins to wood fuselage frames as typically found in the construction of a Grunau Baby and similar vintage sailplanes. And because this adhesive has a hot melt base, it can be removed by reheating to 280 degrees using a hot air gun.

I'm not suggesting this hot melt system is a replacement for more familiar general purpose adhesives like CA, epoxy and yellow glue. It's a more specialized glue that will excel in certain applications, especially bonding dissimilar and/or flexible materials.

There are, in fact, some downsides to this system that may dissuade many potential users. For starters, it requires an initial investment of about $107. This cost pays for the glue gun, heating stand and several cartridges of polyurethane hot melt glue. All components are packed in a fancy looking plastic ammo box that looks cool but is way too big.

Each cartridge of hot melt adhesive costs about $8, not exactly cheap, but it's claimed you get about 71 linear feet of 1/16" bead. It takes about 10-13 minutes for the gun to heat up. Once at temperature, the gun can be left off the heater base for about 20 minutes before it needs to be brought up to operating temperature again. If a glue cartridge runs out during construction, a replacement cartridge must be heated for at least 12 minutes. The shelf life for an unopened cartridge is one year.

The instructions highly recommend wearing gloves while using the system. I did at first but quickly stopped as it's just too clumsy to work with

Cartridge and packaging, the oversize plastic ammo storage box.

them. The glue is not hot enough to burn you. It just sticks like crazy unless you wipe it off before it cools... no big deal.

The cordless hot melt gun is very similar to a calking gun. You twist it open, drop in a cartridge, then place it on the stand to heat up. A green light goes on to alert you it's at the correct temperature. A ratchet trigger advances a plunger that delivers the glue. There's really not much to it.

So there you have it. An interesting new adhesive to consider that excels for certain bonding applications where a relatively quick set plus high flexible strength are required. The HiPURformer™ system does a fantastic job with these applications.

If you'd like additional product information, visit <http://www.steinel.net>.

For sales, you can do a Google search or log onto <http://www.woodworker.com>.

Regards from the shop,

Steve Richman

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* Note: DAW sailplanes are now manufactured and distributed by SkyKing RC Products, <http://skykingrcproducts.com>.

IN A FUTURE ISSUE

Mark Nankivil found a rare Schweizer SGM 2-37 motorglider, USAF designated TG-7A, at the Selfridge ANGB 2005 Airshow in May of this year, and couldn't resist a photographic walkaround for *RC Soaring Digest*. It might be a good scale candidate for electric power.

This particular aircraft was originally in the Air Force inventory but is now owned by the Tuskegee Airmen National Historical Museum, Inc. of Detroit, Michigan <http://tuskegeeairmen.org>.

Back cover photo: John Diniz flew this 40% scale Airworld *Swift,* owned by Peter Goldsmith, during the 2005 JR Aerotow. A very nice aerobatic sailplane which John and others showed off to good effect throughout the weekend. Photo by Mark Nankivil. Coverage of the aerotow event starts on page 4 of this issue.


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