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OPTION 55

Construction

C/L Sky Streak



Reviews

Seagull Models Z-50LS
ElectriFly F-20

143 MIDLAND TX 79706-4439
 621 1607 NCR 1136
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 P175 FM 79706 TURNBOW AP12
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- 315 Type 99 "Val"
- 316 CA-12 Boomerang
- 317 Vega (Air Express)
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Left **Seat**

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Jim Hiller is a consummate modeler, one who likes to design and create his own models. He's not one to quickly dash off model after model. Instead he carefully calculates the goals he'll set for the plane and how best to incorporate them in it. Well, this time Jim did it in duplicate. Let me explain.

First of all you have to go back to his *Option 120*, a sport/Pattern plane he shared with us in the July 2007 issue. His strong interest in Pattern competition explains the carefully considered design aspects of the model. When he first proposed it, he took his time and discussed all the essential design traits with Dean Pappas, then R/C Pattern columnist, and a gifted designer in his own right.

Even though the *Option 120* was a very successful design that met all his goals, Jim is always ready for a new opportunity. That accounts for the *Option 55* he presents this month. It was the introduction of the new OS .55AX 2-stroke engine that first inspired the new model. It seemed the perfect powerplant for a good sport plane to use in club competition events.

Since the original 120 version had proven itself so well, a downsize was perfectly feasible and would retain all the good qualities. That was the plan.

But you know that the best made plans often go awry. In this case they didn't; they just took a new tack which proved that Jim also knows a good name for a plane when he sees it. The .55 AX *Option 55* was built and ready to go but the emerging convenience and evolution of electric power suggested he offer that as an option.

So this month we present the *Option 55* and the *E 55 Option*. You can build the model either way, or if you really want to compare apples to oranges you can build both versions. Whatever you choose to do, you'll be guaranteed a superb airplane that flies more than quite nicely. Either option will prove an excellent choice.

And while we're on the subject of options, this might be a good time to mention former Associate Editor Chris Susicke's latest project, a review of the Seagull Models Zlin Z-50LS. Aside from the fact that it's a very colorful plane and its curvy lines are sinuous, it also provides the option—there's that word again—of using a .75-.91 2-stroke or an equivalent e-power setup.

To facilitate the latter option, the kit contents include what Chris terms a "secondary firewall". It's a mount for an electric motor that can adjust as needed for the proper spinner to backplate clearance. That makes the e-power setup much easier.

The real plane, designed and manufactured in the Czech Republic, was a staple of the aerobatic competitions and was used several times to win the World Championship decades ago. Not only did it look good it flew pretty good as well.

Chris, who is pretty nimble with the sticks, set the Zlin up for electric power with

an E-flite 60 motor and the appropriate E-flite ESC. With a 6S 5000 mAh battery he found that with the combo he would only pull 1500 mA out of the 5000 mAh pack.

More impressively he found that even with the some pretty potent aerobatic agility, it was pretty docile in slow flight, i.e. no warp speed approaches for landing. All in all he liked the performance and he also says the construction and finish of the model is quite good. You might want to look this one over carefully.

Well, we've got more "options"... okay, articles that are pretty interesting, one of which is a return of another consummate modeler, Larry Renger. So it's great to have him back. He's got a lot of models under his belt including a fair number of original designs. And his modeling pedigree goes back a ways which brings up the subject of the *Sky Streak* he shares with us this month.

It seems the model is an evolution of a Larry Scarinzi C/L design, the *Streak*, which 15-year-old Larry Renger fell in love with, maybe because it had a unique forward swept wing. Over the years, he built several versions of the plane.

Then, about eight years ago, he won a Brodak *Little Lightning Streak*. As is usually the case with inveterate modelers he had to add his own twist, or shall we say sweep to it. You'll have to read his article yourself to see how the story ends and with what he says about the plane's ability it may just incite you to building one yourself.

This month with have a tour de force from Greg Moore. Besides his monthly Fan Facts column, Greg has also provided coverage of the World Jet Masters tournament, and a review of the ElectriFly F-20 *Tigershark*. The prestigious World Masters was a first ever for the U.S. Up until now it was held in other parts of the world, and to host it, Roger Shipley, Dewey Davenport and the U.S. organizing committee worked hand in glove with Dave Thomas of the Air Force Museum to field an event that brought more than 60 spectacular jets to Wright-Patterson Air Force Base to join the competition.

Despite a weather glitch during the initial phase of the gathering, it turned out to be a huge success and perhaps a template for future Jet Masters. Greg, along with Bob Boswell got some great pictures for your enjoyment.

And hot on the heels of the Jet Masters, Greg went to his shop and quickly put together the F-20 *Tigershark*. With so many foam edfs from all kinds of sources available, it's hard to separate the good from the bad, in this case, Greg found that the colorful *Tigershark* not only looks good, but flies very well, indeed. See for yourself.

Finally, we turn to Jim Wiggin who got a chance to go to his field of dreams this past July, Geneseo, for the FAC Non-Nats. He went because I "ordered" him to go. If you believe that, then you had better read his report and find out why he really went and what he saw. —FRANK FANELLI



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SPECIFICATIONS:

Wing Area: 455 sq. in.

Wing Span: 50 in.

Length: 39 in.

Flying Weight: 26 oz.

Wing Loading: 8.2 oz. / sq. ft.

Cube Loading: 4.6

Power System: SA Sport BL450 (950K_v) / 30A ESC / 11.1V 1300 mAh Li-Po

The Full House 500 is \$169.00.

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The Hitec X4 AC Plus charger offers a complete charging solution for novice and expert R/C enthusiasts alike. The multi-tasking versatility of this new charger makes it a perfect fit for nitro and electric modelers, regardless of what you drive, hover, float or fly.

Hitec X4 AC Plus Four-Channel Multicharger with AC Power Supply has an estimated street price of \$219.99.

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The 9th Jet World Masters Video

The Jet World Masters is held every two years in a different country. This year from July 24th through August 6th, this first class international event was held at the historic National Museum of the USAF in Dayton, Ohio, making it to the USA for first time.

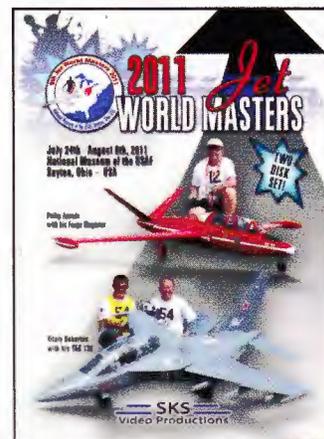
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The New Scale Blade® SR UH-1 Huey Gunship RTF

This is the SR UH-1 Huey Gunship RTF helicopter. The Huey was the first turbine powered helicopter to enter production for the US Military and is most famously known for its service in the Vietnam War. This scale licensed Huey body is based on that famous helicopter. It is a great helicopter for anyone who has flown a single-rotor fixed-pitch helicopter. It comes out of the box programmed to provide a softer climb, pitch and roll response around the center of stick movement. This, combined with the tough, two-piece mainframe and lower head speed, makes the Blade SR more forgiving and easier to master than most conventional CP helis. Plus, it's big enough to fly outdoors even if there's a little wind.



SPECIFICATIONS:

Type: Collective Pitch Electric Micro Heli

Main Rotor Diameter: 21.7 in (552mm)

Tail Rotor Diameter: 3.23 in (82mm)

Gross Weight: 14 oz (397 g)

Length: 19.1 in (485mm)

Motor Size: Brushless 3900 K_V (installed)

Rotor Blade Length: 245mm

The Blade SR Huey UH-1 Gunship RTF (BLH1700) will be available in late October for \$239.99.

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52 grams, APC 9x6E, 10.87V, 12.4A,
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BP A2217-9 Brushless Outrunner 200 Watts (950 RPMV)

74 grams, APC 10x7, 10.87V, 17.4A,
Thrust: 30.5 oz, 168W



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Wing Span: 41.5"
Fuselage length: 26.14"
Flying Weight: 8 oz



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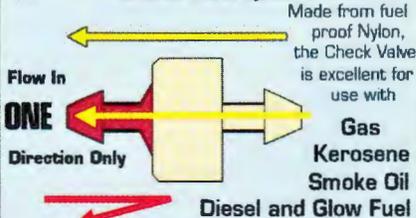
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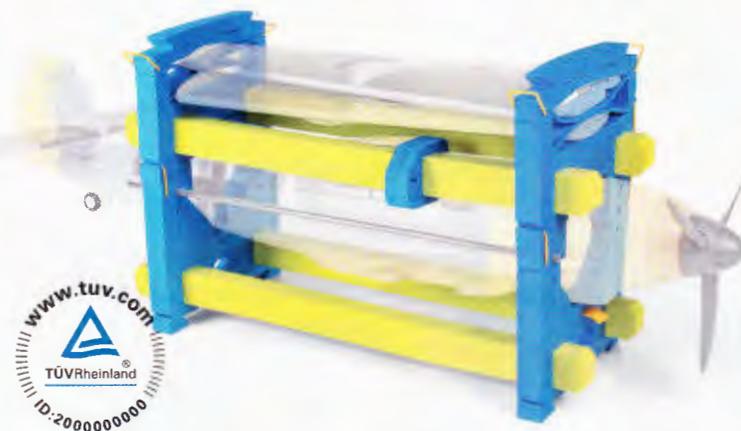
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SPECIFICATIONS:

Wingspan: 42.6 in (1080mm)

Overall length: 35.0 in (889mm)

Wing area: 565 sq. in. (36.5 sq. dm.)

Flying weight: 4.40 lb (2.0 kg)

Motor size: 32-size 1010 K_v brushless outrunner (installed)

Radio: 6-channel radio system minimum

Servos: 5 digital high-speed, high-power sub-micro servos;

1 digital high-power metal-gear mini servo (installed)

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The Balsa USA Student Trainer 4-volume manual, with over 750 photos, will take you through the basics of actually building a wooden model airplane from start to finish. Consider it a complete course in model building, and not just the instructions to a kit.



In this course, you will learn about the different glue and adhesives used in building a model, how to sand and shape the various pieces that make up a model airplane. You will learn to fit parts properly, build straight wings, a straight and true fuselage, and to align a model, plus a whole lot more. Not just the "how" but the "why" will be explained. You'll be offered options and choices with the advantages and disadvantages of each explained. Common problems and their solutions will be discussed and explained. In the end, you will not only have built this model but you'll have achieved a solid understanding of how to build most other models as well and be well on your way to becoming a true "model builder".

The kit features full size rolled plans and instructions, a jig and die-cut parts, pre-bent wire landing gear with nose gear struts, basic hardware package, removable one-piece rubberband-on wings.

SPECIFICATIONS:

- Wing span, 72 inches;
 - Wing area, 840 square inches;
 - Flying weight, 7-8 pounds;
 - Fuselage length, 55 inches;
 - Wing loading, 19-24 ounces per square foot;
 - Engine size, .40-.46 two-stroke or .50-.60 four-stroke.
- Balsa USA's Student Trainer (Kit No. 426) is priced at \$159.95.

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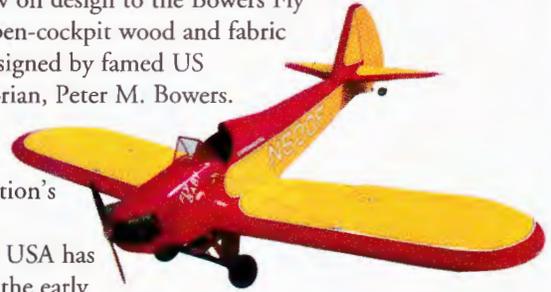
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The Fly Baby Biplane was a follow on design to the Bowers Fly Baby, a homebuilt, single-seat, open-cockpit wood and fabric low-wing monoplane that was designed by famed US aircraft designer and Boeing historian, Peter M. Bowers. The prototype Fly Baby first flew in 1962 and was the winner of the Experimental Aircraft Association's 1962 design competition.



Due to popular demand, Balsa USA has re-released the Fly Baby kit from the early 1980s. Although the kit is relatively simple to build and a true delight to fly, it is recommended for builders with at least some "large scale" model building experience under their belt.

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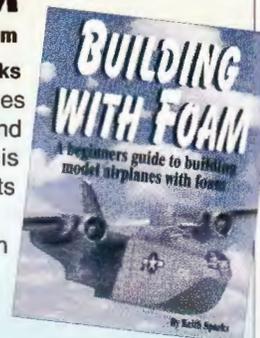
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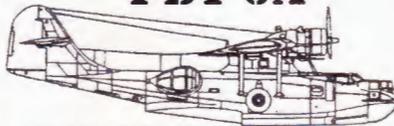
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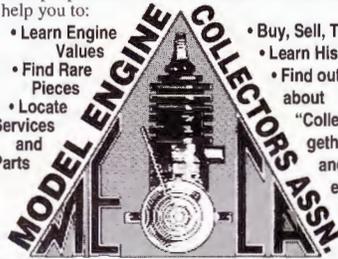


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Nicely done

The Boomerang article by Howard Dwyer in the most recent **FLYING MODELS** was outstanding. I have been a fan of "Booms" for a number of years and encourage any model builder to give one a try. They are great for tossing in-between model airplane flying or on days when you can't get out to the field. Boomerangs are indeed "magical" as Howard Dwyer writes.

To me the **FLYING MODELS** article was valuable on a number of levels. I enjoyed the technical discussion that Howard Dwyer included as it made the piece much more than a construction article. Also helpful were the references for more information included at the end. Wherever possible, I suggest **FLYINGS MODELS** continue this practice. The photos were clear and aided understanding. Finally, I applaud the continued practice of centerfold full-size plans.

The editorial for this issue calls the Boomerang article a "nice change of pace". I suggest it is really a continuation of **FLYING MODELS'** traditional pace of providing interesting and high-quality information on our hobby. Nicely done.

DAVID ZWOLAK
via e-mail

A source needed

While reading John Rutter's construction article on his *Arrow* in the July 2011 issue of **FLYING MODELS**, I noticed his fuselage building jig in the included illustrations. It appeared to be a commercially made product. Would it be possible to know its source?

I always look forward to each month's issue and marvel at the craftsmanship of the contributors.

James W. Bennett
Centennial, WY

The jig is by a British company, SLEC (www.slecuk.com). They sell the jig (Ref: SL054-S) as a sticky vinyl sheet with plastic L shaped supports and blind nuts with plastic bolts. You provide you own melamine sheet to fix everything to, but as this is easily found and relatively cheap (in the UK at

least), this isn't a problem. I was actually given mine in completed state by a friend who'd given up aeromodelling due to health problems but it seems pretty straightforward to assemble, if a little time consuming drilling all those holes! Not too sure about them exporting stuff to the States but it wouldn't hurt to ask.

—JOHN RUTTER

Hooked and happy

Wanted to send you a photo of a bunch of very happy kids. The photo shows the kids at our Summer Adventure Workshop on August 27, 2011 in the midst of building their 12-inch span profile P-51 models from the plans in the October 2009 **FLYING MODELS** magazine.



The kids had a blast and were totally amazed an "elastic band" model could fly so well. At 8 grams without rubber they could hardly do anything but fly!

That's where you guys come in. I'm an old stick, tissue and Ambroid guy and this model required foam dinner plates and we didn't have a lot of time to let the old white glue get dry. We had to get these models built, trimmed and flying in one afternoon!

When the guys at the model shop showed me the Bob Smith Industries CA that was safe to use on foam I was a bit skeptical, but your advertisements were in the **FLYING MODELS** magazine, so I bought a good sized bottle and another of accelerator.

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here. That stuff worked great and it did not have the wicked, eye watering sting of regular CyA and with the accelerator it worked like a dream. I know Ambroid smells bad too but that's got a lot of nostalgia built into it as well!

Seriously though. This CyA and accelerator has me hooked. It's great building that fast and no eye watering smell. We were able to build 17 models with the kids from the kits I had made up in a little less than two hours. And then we went flying and got to use the CyA for a little repair work!

Hey, the kids went home very happy; the local R/C guys came and did a demo for them and all my volunteers went home and slept very well!

Thanks for great product guys. Got an old dog here with a new trick!

ED MCGUGAN
Kincardine, ON, Canada

A wow moment

I read with interest Laddie Mikulasko's SR-71 article (August, 2011, plan #CD424), and I plan to build one soon. I had a *wow* moment when I read how he first flew the model as a glider in his backyard to determine c.g. location. The insight this tip gave me will help me greatly with a design I am working on.

I really enjoy your magazine and this is a good example of why I do.

ED MUNDY
via e-mail

Keeps him going

Love your mag for many years. It always brings me up. I look forward to it every month. I work as a rail gang railroad worker and have very little time to myself between excessive travel and long hours. So I love your small simple projects which still keep me in the hobby I love, till I can retire, if I make it alive!

I like old WWI fighters—so colorful and sharp. Would love to see a plan for an Eboneezer WWI or whatever, with trimming and flying tips, seaplanes, racers, home-builts, etc.

STAN DABROWSKI
Wilbraham, MA

Maintain the tradition

Your September 2011 issue contained six feature articles. One of these was about building a model airplane, three were about plastic ARF store-bought models, and one was a picture spread of a commercial model show.

Please review the format that has kept you in print for so long. I've read **FM** since 1952 when I bought it for 25¢ at the drug-store, and now having subscribed for the past 24 years.

Yes, if it were easy, anybody could do it! There are still model builders out here, and **FM** has been the only publication for a long time.

CHARLES JACOB
La Junta, CO

A pleasant coincidence

It was a very pleasant surprise to open the July issue of **FLYING MODELS** and see Ian Smith's *Hard Ship*, a clever Australian makeover of a vintage British control line design from 1950, the *Firebrand*.

And the reason for my delight? I had only very recently featured the original *Fire-*



brand in *Circle Talk*, the newsletter of Barton MFC, England.

The attached color photograph is of Graham Jubb, a friend since our schooldays, who is holding his replica of Ralph Cooke's original *Firebrand MkII* as published in *Aero Modeller* magazine, June 1950.

Before moving to the Northwest, Graham was also a junior club mate of designer Ralph Cooke.

PETER BRANIGAN
Liverpool, UK

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IT'S BACK!!! (And just in time for Christmas)



Remember when you were a kid and couldn't wait to get up Christmas morning to find a model airplane kit under the tree... Well, thanks to Bob Lang and Dave Acton of PAL Model Products, one of the greatest P-30's of all time... the **Blue Ridge Square Eagle** is back and better than ever.

That's right, guys, the **Square Eagle** is back with laser cut fuselage sides and machine cut ribs. Be one of the first ones to grab this part of history and be that kid again. The **Square Eagle** has won more contests than any other P-30. The price is right... only \$36.50 + shipping. Now that's a bargain.

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OPTION 55



Have it your way: a .55 nitro, or electric power. Either way the options in this sport plane make it a great, agile performance plane.

By Jim Hiller

PHOTOGRAPHY: JIM HILLER

When OS offered their 55-AX I just had to have one. It was immediately apparent that this could power a nice sport plane for club activities and it was easy to scale the *Option 120* CAD drawing (**FM** July 2007, CD319) to about 80%. Anticipating local interest I felt an all built-up construction would be more desirable than using foam cores. The convenience of electric prompted me to offer this design using either electric or glow power and I asked my friend, Bryan, at B&B Hobbies (<http://www.bandbhobbies.com>) to recommend suitable components. E-power has been a viable option for several years, and at 81 ounces, the E-55 is equal to the glow version (less fuel) and exceeds its performance. I liked the E-power version so well I sold the glow version I built two years ago. With the exception of the front fuselage formers the airframes are identical.

Parts preparation

Scratchbuilding can be a pleasant and rewarding experience so take your time cutting and preparing the parts. A materials list and part patterns for both versions are

on plan sheet 2, as well as a construction sequence guide to help organize building activities. Apply the patterns to the sheet wood with a light dusting of spray contact cement (3M-77). Allow the adhesive to dry until it barely sticks to your fingers before placing the patterns on the wood or they will be difficult to remove. I usually cut all the parts first in several short sessions to prevent fatigue and sloppy work. Many parts are cut in pairs by stacking the wood blanks.

The wing rib leading edge notches, alignment holes and the edges that receive the $\frac{1}{16}$ -inch balsa sheeting are the most critical. Extra material can be left on unsheeted rib edges to be dressed after assembly. I sand the fuselage former edges to the line with an angled sanding block to get a tight joint.

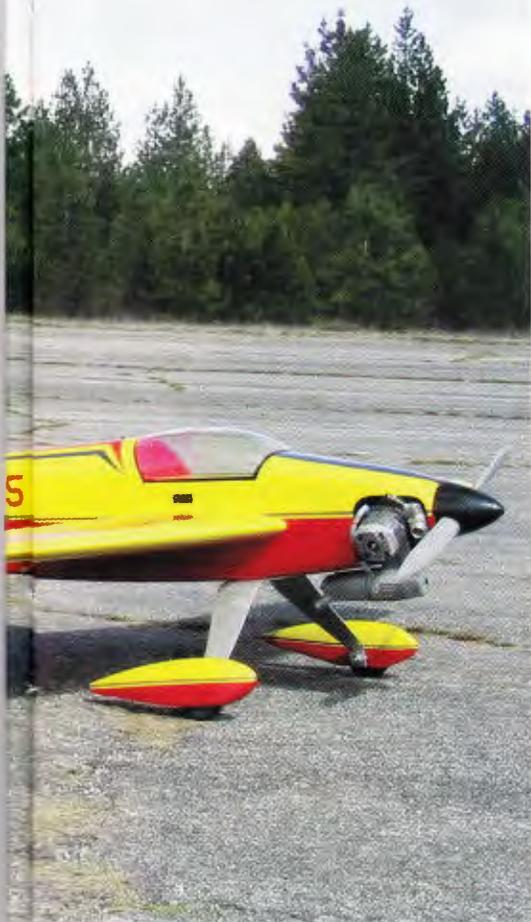
Trim an edge of a piece of scrap $\frac{1}{2}$ -inch balsa to 87 degrees and face it with 60-grit sandpaper. Space the formers on a piece of scrap when sanding. Label the formers when removing the paper patterns. Position the fuselage sides, doublers and formers over the drawing and use the extension lines as a guide to mark the centerlines and former locations. I preform the curved $\frac{3}{32}$ -inch

sheet balsa by wetting them and wrapping them with an Ace bandage on a cardboard tube (about 4-inch diameter) obtained from a carpet store.

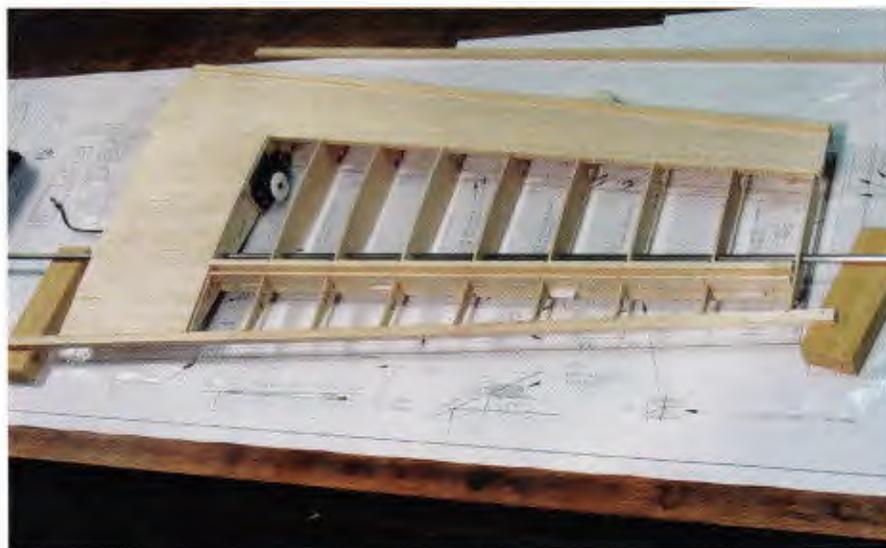
Fuselage construction

Prepare the fuselage sides by adding the doublers and edge sticks, front former locating keys and rear servo mount plates. Test fit the formers to both sides trimming the notches if necessary to align the centerlines. Fit the wing incidence adjuster assembly making sure the center of the brass tube is six inches from the wing tube center. Do not add the wing tube support donuts at this time.

Using the former angle gauge glue F-6 through F-11 to one side and flip it over and glue the formers to the other side. Position the sides above the drawing top view and block the sides to prevent movement. Using slow set epoxy, insert the adjuster assembly and add formers F-4 and 5. Bend the sides together and add the front formers and the triangles between the formers and sides, maintaining centerline alignment above the drawing. Trim the top $\frac{3}{4}$ triangles to match



The best way to start is to make up a kit. Jim starts the beveling of the aileron leading edge (above). The completed parts are all cut out ready for assembly (below). The author uses a spray adhesive to aid in the cutting of the individual parts using a copy of the full size plans. Text has details.



With the wing now sheeted, the trimming of the trailing edge, aileron spar and leading edge are completed just prior to final sanding. Thanks to the reliability of modern day servos, the servos can be mounted within the wing, giving the model a much cleaner, aerodynamic look.

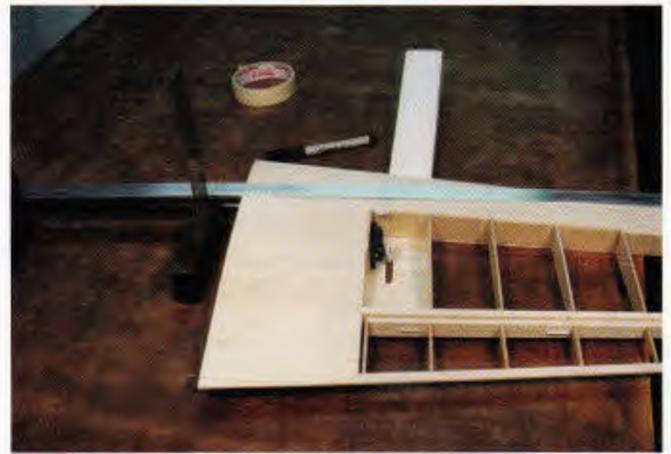
AT A GLANCE

Type:	R/C sport/pattern
Construction:	balsa and ply
Wing span:	55 inches
Wing area:	580 sq. in.
Airfoil:	symmetrical
Length:	55 inches
Weight:	5 pounds 1 ounce
Wing loading:	20.1 oz./sq.ft.
Prop:	APC EP 14-10 (electric)
Engine:	O.S. 55 AX
Motor:	E-lite Power 46
ESC:	Castle Creations Phoenix ICE-75
Battery:	Thunder Power 4400 4S 30C
Radio:	4-channel, 5 standard servos

Option 55



Final sanding of the trailing edge and aileron leading edge (above left). Location of the wing tube retaining screw is performed by extending tube edges



to top sheeting and just beyond rib R-1 (above right). A block of foam to keep the wing flat as well as a square and an aluminum yard stick aid in this function.

the curved sides and epoxy in place. The fuselage curve should now be stabilized and so it now can be removed from the drawing. Add the curved turtle deck sides, bottom front triangles and landing gear mount rails. Sand the top and bottom surfaces flush and add the bottom sheeting and wing incidence adjuster guide tubes. Add the remaining cap blocks and rough shape them.

Before final shaping we need to install the motor and mount the spinner to mark the nose for final shaping. For the glow version use the engine cutout template to cut an initial opening. Install the engine mount and trim the opening as necessary to install the

engine. The electric motor will need the shaft positioned for front mounting and can be installed through the open hatch. Slipping a brass tube over the shaft helps guide it into position.

Canopy construction

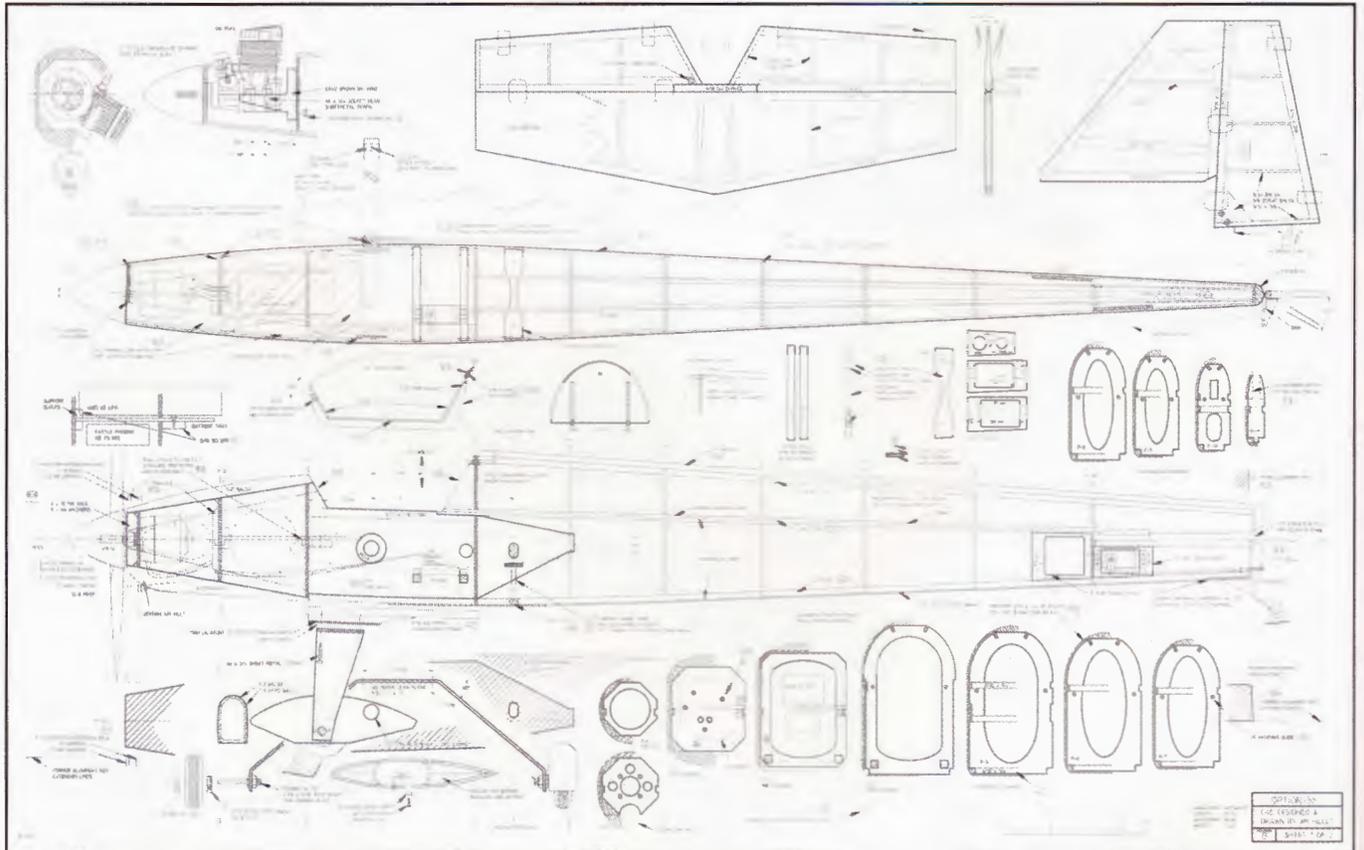
Fit and glue an oversize $\frac{3}{32}$ -inch balsa canopy floor blank to the plywood frame rails and trim the front and rear of the fuselage opening to match the plywood frame. After fitting the hold down cleat and adding the canopy ends you can trim the edges to match the fuselage. Leave a little extra on the top edge to accommodate the canopy an-

gle. After installing the latch, fit a $\frac{1}{16}$ -inch plywood reinforcement washer.

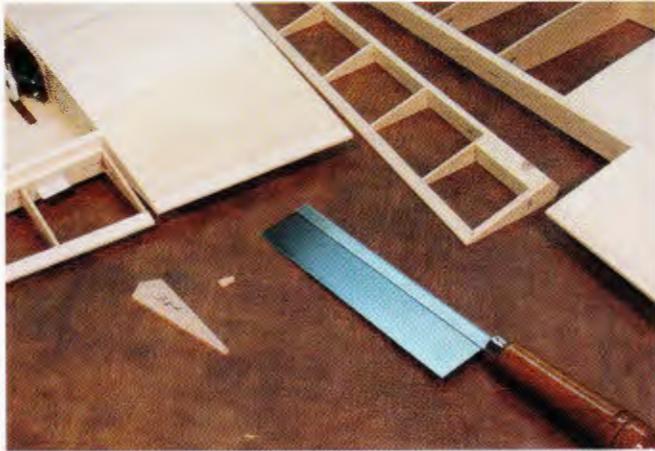
Rough cut the canopy and press the base assembly into it using a backup block against the plywood frame to prevent twisting. Cut the canopy slightly oversize all around and glue it with foam safe CyA and carefully trim the excess material flush.

Wing construction

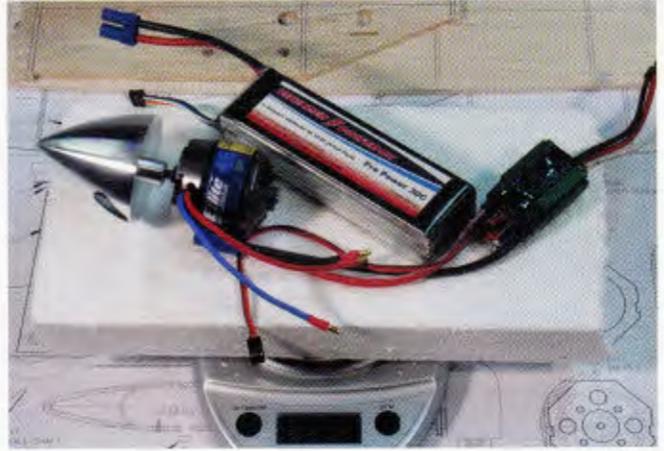
A few passes with a coarse sanding block makes quick work of beveling the spars and the aileron leading edge angle can be trimmed using a block plane. The drawings on sheet 2 show the setup to get the proper



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Aileron removal after finish sanding. Using a razor saw, carefully cut both ailerons free from the wing (**above left**). An E-flite Power 46 brushless motor,



Castle Creations Phoenix ICE-75 ESC and Thunder Power 4400 4S Li-Po power the electric version with an all-up weight of 33.2 ounces (**above right**).

angle. Preparing and hinging the ailerons before glue-up keeps them aligned during final sanding. Add centerlines to both sides and cut the hinge slots. The rib notches can be cut with a few strokes of a sanding stick made by gluing 60-grit sandpaper to the edge of firm 3/32-inch balsa scrap.

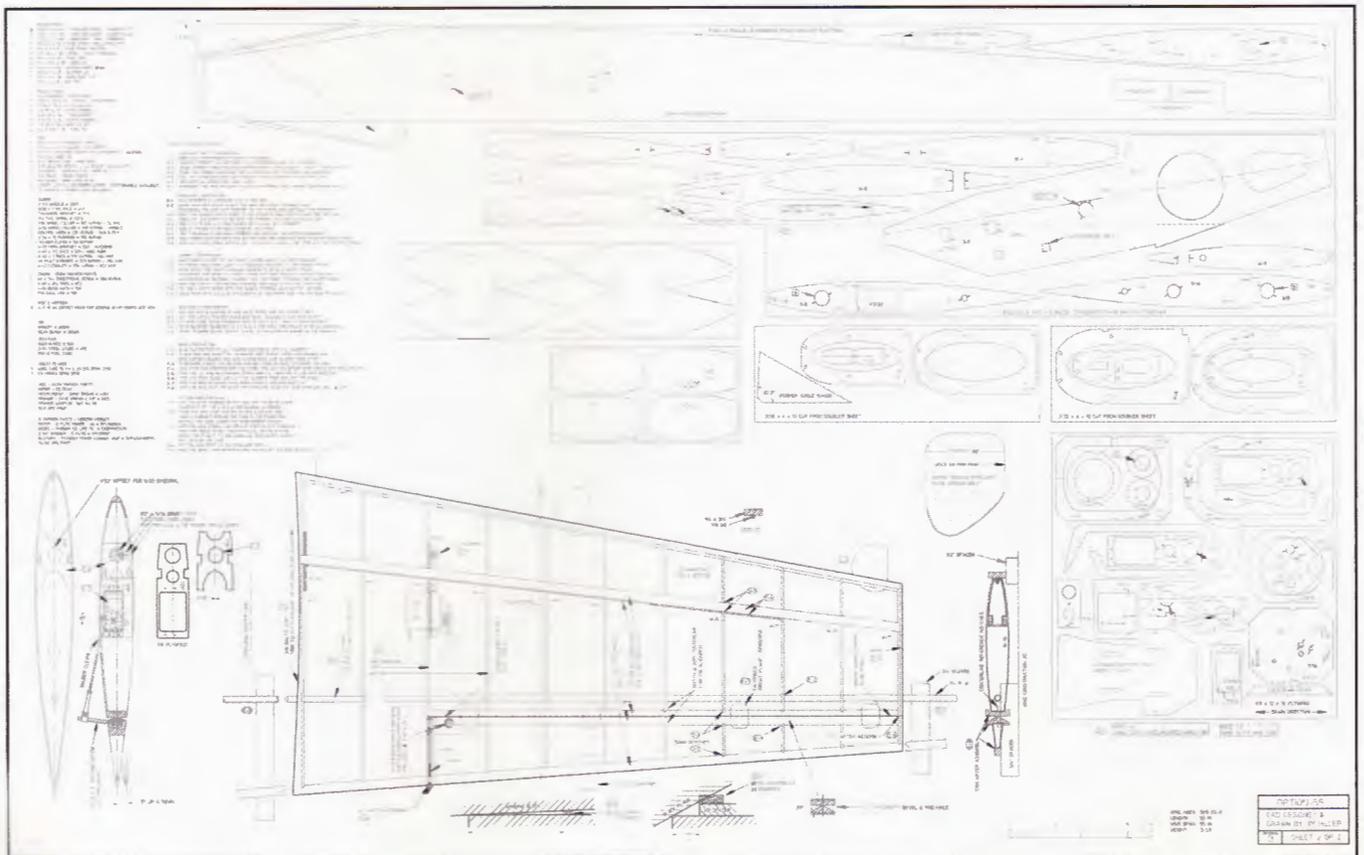
An adjustable incidence mid-wing design is desirable in an aerobatic airplane and worth the extra effort. Wing dihedral is built into ribs 1 through 3, which have a top/bottom orientation. Over the years servos have gotten so reliable and trouble free that I just build them in. Be sure to power-up the servos and center the rotation before installing

the arms. I should mention that it's easier to add the plywood rib doublers before assembling the wing panels. Fit the wing tube with minimum clearance and, if they get loose, simply paint the edge of the hole with epoxy and re-sand the fit. The tape wrap on the wing tube allows additional clearance in the wing root ribs and fuselage sides to prevent binding when inserting the tube.

Thread the ribs onto a 1/4-inch rod spacing them over the drawing and support the rod on 3/4-inch blocks. Add the leading edge assembly supported on 1/2-inch blocks and install the aileron hinge spar aligning the centerline with the centerline saw cut in the

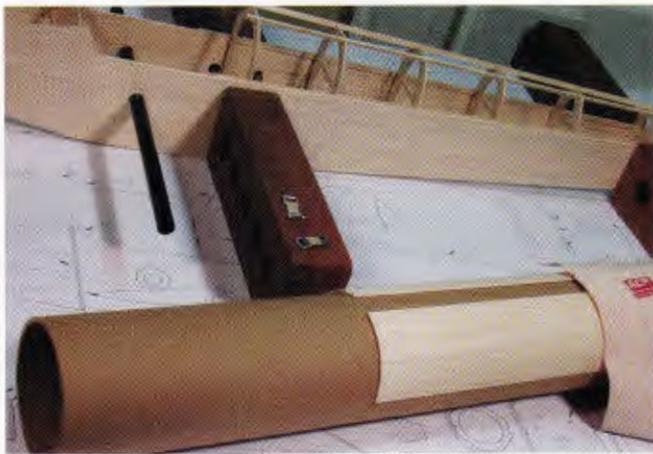
ends of the ribs. Next insert the aileron ribs in the aileron leading edge notches, aligning them against a flat surface such as the edge of your bench and secure them with thin CyA. Insert the hinges but do not glue them until after covering. Center the ribs in the trailing edge material. After adding the 1/16-inch top sheeting flip the wing panel over and reposition the support blocks and install the bottom spar, shear webbing and sheeting. Build the left panel over the drawing being sure to position ribs 1 through 3 with the top edge down.

Trim and finish sand the wing panels before cutting the ailerons free. Final blend-



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Option 55



The smooth lines of the *Option 55* turtle decking is achieved by pre-forming the sheet balsa before fitting to the fuselage by using a cardboard tube (above left). Once dried, the preformed upper fuselage sides can be applied to the turtle deck



(above right). Fitting front corner triangles (below left) which will be sanded after the installation of the electric components. Motor, Li-Po battery and ESC in the final position (below right) prior to closing in the front of the fuselage.



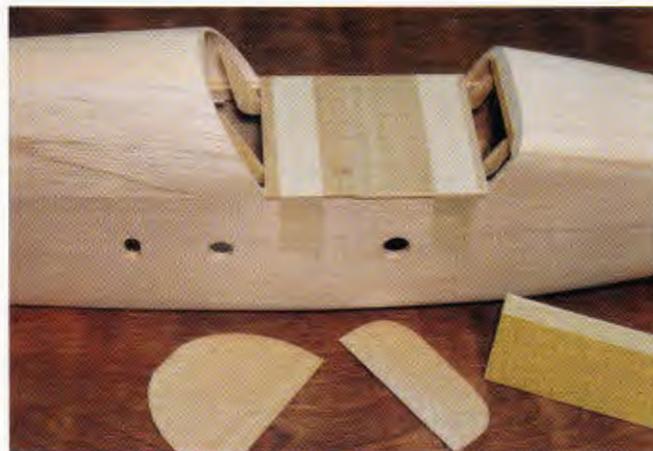
ing of the oversize ribs is easier if the panel can be held with both hands and moved against an abrasive surface. An 8-inch x 4-foot shelf board covered with 100-grit sandpaper works well. Dress up the ends and add the doublers. You will shape the root cap material to match the fuselage curve and drill and tap the wing tube retaining screw holes after alignment with the fuselage and stab.

Wing and stab alignment

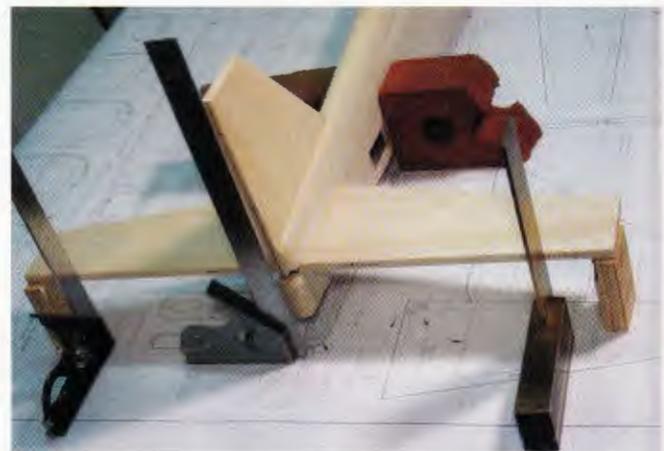
Okay, the hard work is finished. After mounting the stab it's time to align the wing. Position the fuselage over the drawing top view and install the horizontal stab using the hinge line reference marks to square it up and add the vertical stab. Before trimming the wing root caps, align the wing assembly with the fuselage centerline and set the wing tube. To prevent installing the

wing assembly multiple times, sand extra clearance where the wing tube passes through one side of the fuselage to allow movement of the wing assembly.

Mount the wing assembly, sliding the plywood donuts over the tube as it passes through the fuselage. The wing root rib and plywood donuts should be a snug fit over the tape wrapped tube. The slightly larger diameter of the taped tube simplifies inserting



The fitting and construction of the canopy base is shown here (above left). Notice the plywood frame rails which provide both rigidity and aid in alignment.



Horizontal and vertical stab alignment is aided with the use of a few blocks, squares and two bricks to keep the fuse from moving (above right).



COMPARATIVE WEIGHTS AND COSTS

	E-POWER		GLOW POWER	
	Weight (oz)	Price	Weight (oz)	Price
Motor	10	\$ 90	18.5	\$160
Motor Mount	N/A		1	\$ 5
Battery	17	\$165	4	\$ 18
BESEC	2.4	\$120	N/A	
Fuel Tank	N/A		5	\$ 5
Servo	N/A		1.5	\$ 11
Spinner	3	\$ 27	1.5	\$ 7
Total	32.4	\$402	31.5	\$206

The completed *Option 55* is held by its creator and is ready for its first flight (at left). With such smooth lines, the *Option 55* will certainly get a lot of attention and will stand out from all those Almost Ready to Fly airplanes, so common at the flying field. A comparison in cost and performance (above) shows that electric technology has come a long way. Performance is close to consistent with either option.

the tube without binding. Insert the 1/4-inch dowels, but do not glue them, and adjust the incidence. Block the wing tips until they are level with the horizontal stab by viewing the two from directly behind the fuselage. Measure from the vertical stab hinge line to the aileron hinge spar at the tip, adjusting as necessary to get equal measurements and recheck everything.

When satisfied with the alignment, epoxy the plywood donuts in place being careful not to glue the tube. A small bead of epoxy near the outer edge is sufficient. Rotating the donuts against the fuselage sides spreads the epoxy nicely. Finally, mark and fit the wing root caps and glue the 1/4-inch dowels.

Trimming and flying

Before leaving the shop balance the assembled airplane laterally by adding weight

to the lighter wing tip and longitudinally to get close to the recommended c.g. location. Adjust the wing incidence and left and right as well as up and down aileron travel to be equal. The easiest way is to use two transmitter channels and adjust the endpoints. I've always found that a little more down than up elevator travel is desirable to get a more equal stick feel. The control deflections shown on the drawings should get you in the air uneventfully provided the travel direction is correct, double check it.

The 34% c.g. location shown on the drawing is a good starting point. Elevator neutral trim can vary between models due to weight, c.g. location and flying style. Adjusting the wing incidence easily re-centers the elevator and aileron neutral position. For example, if right roll trim is needed clear it by reducing incidence on the right wing panel. If up elevator trim is needed, add wing incidence by

adjusting both wing trailing edges down the same amount. A half turn on the adjusting screws should be noticeable but not excessive.

E-power info

I used the Castle-Link to review current draw running several different props on the ground, installing an APC 13-10E for initial test flights. The vertical performance exceeded the glow version without exceeding the recommended motor amperage leading me to believe this prop, although adequate may be a little conservative. I'm currently running a 14-10E using about 3000 mAh, 70% of the battery capacity in an average 10-minute flight. The power system is running cool and comfortable. I didn't try to get by with inexpensive or marginal components and this is where it paid off.



Two completed *Option 55*s—the electric version in the foreground and the O.S. 55 AX in the background. Both aircraft perform the pattern with the electric version having a slight advantage in vertical performance.

Cross *Files* by don ross

You can reach **Don Ross** at 817 Ames Hill Drive, Tewksbury, MA 01876, or via e-mail at flywords@comcast.net

More bad news from Superior Props. Harold Davidson writes to tell us that he has waited over six months for an order that has yet to be filled. Others have said the same. I've talked with the proprietor and he offered some explanations but so far, no props. Fortunately, a new kid has just arrived on the block and he seems to have a lot of the stuff we need. He operates under <http://hobbyspecialties.com/index.php>. I was incorrect in a previous column when I listed him as hobbyspecialists—my bad.

Alan carries lots of good F/F stuff including hand carved props, spoked wheels and timers. He lists no street address so you computer challenged oldsters will have to get your grandkids to help. You can also e-mail him at alan@hobbyspecialties.com.

More bad news. Don Butman writes to tell us that Alan Hunt is now a "No Reply". Alan had some fine plans that were not available anyplace else. We'll miss him. I'll write and try to find out what happened.

Jack Sarhage writes to ask about a flight log for his *Beautiful Bess*. A flight log is an item that can be very useful and can even save your airplane, but first let's talk about a "Reward for Return" label.

Over many years I have lost some 22 F/F models (real men don't use D.T.'s, they go get the model) and got 18 or 19 back—two from over 6 miles away! I buy some Avery adhesive label sheets at the local Staples and make up a label that reads REWARD FOR RETURN with my name, address, phone number, e-mail address and AMA number in small type. I then print up a whole sheet (Staples will do this for you if needed), laminate a clear sheet on top and stick this on each model and wait for a call.

On one occasion, it took three months, but I got the *Sparky* back and am still flying it.

PHOTO: CHARLES YOUNG



PHOTO: JOHANN VAN ZYL

Here's Johann Van Zyl launching his P-51, from a *Tailspin* newsletter plan. He says it flies left-left. Would it fly right-right in the Northern Hemisphere?

This whole project takes less time than making up and lubing a rubber motor and costs less than \$5.00.

Now to a flight log. First the heading should describe *all* the details of your model. Weight, wing area, wing loading, prop pitch and diameter, rubber or other power and initial incidence and thrust adjustments. Then start some columns like date, weather, wind (your best guess) glide tests and initial results. If you have my book on rubber power, make sure you follow the proper sequence of flight trim steps—Weight, Balance, Incidence, Flat Glide, Torque, Turn, Stop Watch.

The reason for this sequence is that most

trim adjustments are interrelated so if not done in the proper order, adjustment #3 might undo adjustment #1. For instance, if you increase the wing incidence to flatten the glide before balancing the model fore and aft, you are looking for a stall and crash under power. To help you remember, try "Why be in far Germany to trap some whales". The first letter of each word tells you the steps.

Now, list each flight including number or turns, adjustments (measure your adjustments such as "added 1/16 under wing L.E.", etc. Describe the flight results (try to avoid "O.O.S.") as it shortens the list. Before your next flight, analyze the previous results and



PHOTO: JOHN MCCORKLE

Ken Fisher is in his 80s and can still chase F/F models. Here he is (at left) with his *Big Pussycat*. The plan comes from Darcy Whyte's web site. John McCorkle loves the *Sparky* (above), as does Don. He has built several and all fly well. His latest sports a 12-inch folder.

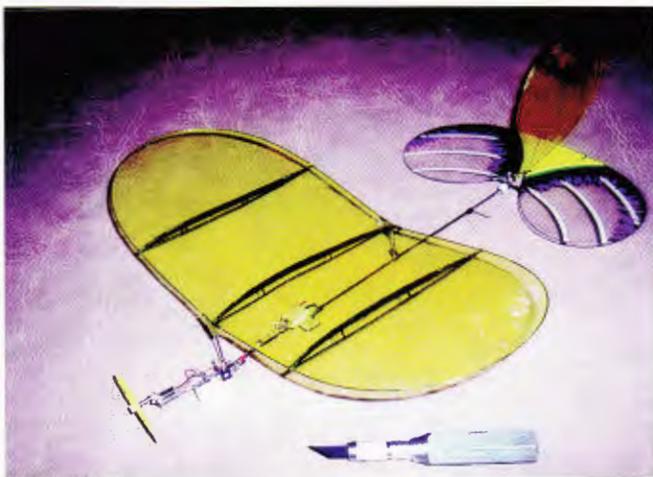


PHOTO: JOHN KRULSE

John Krouse reverses history with his R/C *Vapor* converted to a F/F *Vaporette* (above). He has cleverly designed equipment that produces a model 30% lighter than the original with good flight characteristics. Curtis O. Moss is a new contributor and has lots of models to show. His "Pink" J-3 *Cub* (yes, they made them in colors other than yellow) spans 50 inches and is scratchbuilt for two-channel R/C (at right top). To show his versatility, Curtis sent three endurance models: (at right) .049 powered *Mini Pearl* on left, 80% *T-Bird* for .020 by Campbell, original .020 by Curtis.



PHOTOS: CURTIS MOSS



decide what new adjustments might be needed. I generally make three adjustments at the same time which often makes Rich Fiore laugh a lot.

Try to avoid warping the wing or stab as this is hard to repeat until you get some more experience. Each flyer ends up with his own flight log according to his habits and preferences. The late Tony Peters' logs were quite extensive and his flights were usually spectacular.

I think a flight log will make anyone a better modeler as well as flyer because you tend to build in the kind of adjustments you prefer to make before you fly. At first put in all the info you can think of, then later modify or shorten to taste.

Several have asked how to get in touch with Dan Kuenzel. His e-mail address is dmkuenzel@comcast.net.

Next, John McCorkle sends his newest *Sparky*, (one of my very favorite airplanes). It has a 12-inch folding prop and flies on six loops of $\frac{1}{8}$ -inch Tan rubber. At a weight of 85 grams, it should be a fine flyer (mine is 30 years old, lost twice, covered twice and can still top two minutes). Tying into the upper paragraph on flight trimming, the *Sparky* is a good subject. It is stable, forgiving of bad launches and reliable.

You have seen many of Charles Young's flying efforts. Now, he shows us Ken Fisher with his *Big Pussycat*. Ken is in his 80s and has built many scale stick and tissue models over the years. Now he is trimming out the *Pussycat*. It is a stock model with a 6-inch gray plastic prop from Peck, two loops of 2mm rubber a bit longer than prop to peg.

Charles uses sequins from the dress department at Walmart for prop washers; he says they cost about a dollar for a thousand. He also likes Gorilla Glue for modeling. The stuff foams a bit which helps fill gaps. Charles also recommends Darcy Whyte's EndlessLift site for very good building info.

Charles has been flying indoors in the County Ice Arena building. We tried that on Long Island once when Rich Fiore helped get the site. However, we found the cold had a bad effect on the thin rubber of EZ-B's and other light indoor models. The heavy air didn't help our times much either.

Next, some news from South Africa. Johann Van Zyl shows us a launch of his P-51. The photo was taken at a flying site about 50 km from Capetown. The P-51 is from the *Tailspin* newsletter. (These club newsletters travel all over the world and are worth having on any builders desk.) The P-51 flies in a very stable left-left pattern.

The 3-bladed prop comes from Niel Anderson via his son, Garth. It utilizes a custom-molded 3-blade fitting that uses standard plastic blades, probably from K&P and pitch can be easily changed. Johann has also finished a Diels P-40 that we'll show soon.

John Krouse has reversed history. He has taken the *Vapor* indoor electric R/C and converted it to indoor electric freeflight! He has reduced the weight from 15 to 10.5 grams, resulting in a very low wing

loading of 0.70 ounces per square foot. John says the plane has excellent flight characteristics with a steady, gradual climb followed by a very slow power-off descent. If you are interested in the details, you might contact John at JBKrouseHouse@aol.com. John may do an article on the project in the future.

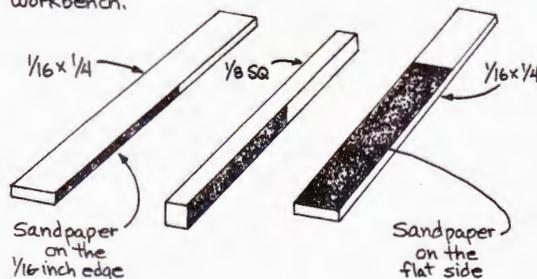
Every once in a while I get a letter from a new builder who tells me how he or she has been building since the 1940s. They also include much of their personal history and that makes great reading. Curtis O. Moss is one. He taught advanced electronics and physics in the Air Force for over 20 years. He is also a licensed A&P and avionics technician who liked working on the older and homebuilt aircraft. Curtis sent me a lot of pictures and for now, I'll show you a couple. He also mentions that he has developed several helpful things for builders and may be able to send sketches for the column. Curtis, we all look forward to any ideas you may have. The three F/F endurance models show Curtis's fine building ability and the J-3 at 50-inch span for gas R/C shows his versatility. Curtis is another who learned to fly full scale in a *Cub*.

On a final note, we hear from Copter Concepts that his *Commuter* rubber heli kit will become available by October 30, 2011. 

Chuck's Choice

FROM THE WORKSHOP

Paint small sanding sticks a bright color so they are easy to find amid the usual clutter on the workbench.



Sanding sticks can be hard balsa or bass wood.

ILLUSTRATION: CHUCK WENLOCK

Oldtimer *Topics* by mike myers

You can reach **Mike Myers** at 911 Kilmory Lane, Glendale, CA 91207, or via e-mail at mikemyersgh@charter.net

As I write this, I'm getting ready for the SAM Champs held the first week of October. Like everyone else getting ready for a big contest there's a flurry of activity in the shop. While many contestants in the 1930s finished their models the night before the contest—the Champs is five days long—and I plan to get some sleep between contest days.

Alternating the Champs between Muncie and Boulder City means that, every year, the Champs will be a long way away for somebody! Karl Pfister and the boys in Indiana organized a two-day Old Timer contest in June to accommodate the Eastern guys who couldn't make the long trek to Boulder City. There's a picture of the Indiana guys having fun at that contest in this column. Karl, the CD, supplied the photo.

One good thing about the Champs is that you are flying on big fields. There's room to "let the big dogs eat" in the unlimited duration "bet your plane" old time F/F events on El Dorado Dry Lake. It's a long way to "off the field" at El Dorado Dry Lake so the boys have lots of fun, and some very long flights.

In today's society, big fields are hard to find. Four of the pictures in this column show models that can be flown on small fields or city parks. Your columnist has flown in the annual *Cloud Tramp* mass launch (held on the first Saturday in August) for 8 or 9 years. Modelers fly in it all over the world—at the same hour. Peter Michel's photo of his *Cloud Tramp* is proof that you can build a *Tramp* from a single 3 x 36-inch sheet of 1/16-inch balsa, plus odds and ends from your scrap box.

Two weeks after the photo was taken, Peter and 30 other English modelers launched their *Cloud Tramps* at Epsom Downs outside. At the same moment modelers were putting their *Tramps* in the air in New York, Virginia, Alabama, Texas, Montana, Arizona, California and Alaska—to your columnist's personal knowledge—plus a whole



PHOTO: KARL PFISTER

The boys in Indiana organized a two-day Midwest SAM Champs event in June. Karl Pfister was the CD and he sent this photo of the boys who flew at the contest.

bunch of other places that your columnist can't vouch for.

Van Wilson of Alaska was one of those *Cloud Trampers*—but the photo here shows him letting go of a *Cadet* towline glider using a small high start. He said the *Cadet* had a great flight on that launch. The high start for freeflight towline gliders isn't a new idea. See page 160 of the *1938 Zaic Model Yearbook* where Frank describes the technique and calls it a "catapult launch". If, like me, you've lost a step or two of foot speed, a catapult launch is the way to go. You can launch a light F/F towline glider of 36-inch wingspan or so using just a 25-foot strip of 1/16-inch rubber and 100 feet or so of kite string.

There are also pictures of two Speed 400 Scale flyers for the new event at this year's Champs. The Curtiss *Robin* and the Stahl *Interstate Cadet* have long been favorite subjects for the F/F Rubber Scale and Gas Scale events and either one would make a great park sport flyer. Glenn Poole built his Curtiss *Robin* for the R/C event from the start. Bud Matthews started his *Interstate Cadet* in the mistaken belief that there would be a F/F Speed 400 Scale event. He used an ESC for speed control and motor shutoff, but planned to use the radio only to trigger a servo actuated dethermalizer. When he discovered the event would be R/C only, he made up two tails for the airplane. One has rudder and elevator controls. The other will



PHOTO: PETER MICHEL

Peter Michel, of Epsom England, says that a *Cloud Tramp* (above left) is as much fun as you can have with a 3 x 36 sheet of 1/16 balsa and some bits from your scrap box. He's right. Van Wilson, of Alaska (above right), is "caught in the



PHOTO: VAN WILSON

act" of releasing a towline *Cadet* glider—pulled up in this case by a small high start. A small high start made of 25-feet of 1/16-inch rubber and 100 feet of kite string, can easily launch a 36-inch wingspan F/F towline glider.



PHOTO: GLENN POOLE



PHOTO: BUD MATTHEWS

Glenn Poole, of Illinois, built this Curtiss *Robin* (above left) for the new Speed 400 Scale Duration event that will be flown at this year's SAM Champs. One of Bud Matthews' favorite scale subjects is the Stahl *Interstate Cadet*. He's built

them in several sizes. This one (above right) is set up for this year's Speed 400 Scale Duration event. Dr. George Shacklett, from Tennessee, always builds a "tasty" looking model, and this Lanzo *Racer* is no exception (below).

PHOTO: GEORGE SHACKLETT



be a F/F tail—no rudder, no elevator and DT only.

Bud is on to something here. There has been pressure to have electric powered F/F Old Timer events. There is a special Electric *Tomboy* F/F event at this year's Champs. It's sort of the "electric camel" slipping its nose under the OT F/F rules tent. The 2010 Official SAM Rulebook already allows the use of a 2.4 GHz radio to "initiate a dethermalizer action" in SAM freeflight events. Right now it's possible to get a cheapo full range 2.4 GHz radio in some of the discount hobby shops out here in California for under \$50. The ability to trigger a DT when it looks like your F/F model is going to do a flyaway on a small field is a great thing. It wouldn't be a surprise if the next revision of the SAM competition rules included some F/F electric events—even though the spark ignition and rubber power boys may scream "heresy".

But let's leave that argument for a future day. Dr. George Shacklett down in Tennessee sent a picture of a proper sized Lanzo *Racer*—none of that small "parky" stuff for our George, or at least not in this photo. His note said he built the *Racer* for the Foxacoy event.

Kudos go to long time FLYING MODELS advertiser Micro Fasteners. They learned that some Marines in Afghanistan needed a supply of small parts and fasteners to build models. They sent a few "lifetime supplies" worth of stuff to the USMC modelers free of charge. SAM 2009. Dick Fischer, learned of

the story and told me about it. I visit Micro Fastener's booth at the AMA Convention every January and stock up for the year. They've got good stuff.

Andrew Curl from England wrote of his success in using UHU "kiddy glue"—the kind that comes in a pen—to cover with tissue. Quoting Andrew, "It sticks quick, doesn't cause discoloration, it stays put when you

water shrink it, and if you stuff the covering up, you can just chuck the offending part in a sink of warm water and you can get the tissue straight off, too.

"I've got my wing covering technique to the point where I can do both surfaces at once with a single sheet now. Never used to be able to do that. Glue to the trailing edge, put glue on the leading edge and let it dry. Pull the sheet right around and secure to the trailing edge again, water shrink, then if things look okay activate the leading edge glue with warm water from a brush before doping"

Bob Langelius has been supplying very nice small reproduction engines for quite a while. He's now branched out with some partners to form Pal Model Products. Their website is www.palmodelproducts.com. What caught my eye about the new company is that they will be supplying the famous Blue Ridge Models *Square Eagle* P-30. The *Square Eagle* was a very competitive P-30 in its day. Blue Ridge cut their kits only when they could find excellent quality light balsa wood. No good wood—no *Square Eagle*! I sometimes had to wait a year to find a replacement *Square Eagle* kit on the local hobby shop shelves after a flyaway. **CC**



PHOTO: JIM ALLING

The new compressed air motors offer some great possibilities for scale models. The F4U *Corsair* was sometimes referred to as "Old Hog Nose" and that long snout neatly surrounds the air tank in this "bones shot" of Jim Alling's model.

Seagull Models

ZLIN Z-50LS



By Chris Susicke

Nitro or electric, this .60 size sport scale model is an agile hot rod!

PHOTOGRAPHY: CHRIS SUSICKE

The Czech aircraft company Zlin is probably best known for their trainers, and their line of high-performance aerobatic aircraft. The Z-50, which first flew in 1975, was no exception. Flown in several World Aerobatic Championships, it carved a name for itself by taking home the gold in 1978, 1984 and 1986. Respectable placing was achieved in several other years as well.

Several variants have been produced (mostly different powerplants), including the LS as seen in this review. Although outdated by today's first-class aerobatic standards, many Zlin Z-50s still fly, perform and wow the crowds to this day.

I have always thought that the Zlin line of aerobats have a certain curvaceous beauty to them, but have never had a chance to get in some stick time on one. So when I was offered the chance to review Seagull Model's rendition, I couldn't wait.

Adding to my excitement was the fact that this is not the first Seagull model which I have had the pleasure of reviewing. Back in the March, 2010 issue of **FM** I reviewed their *Gee Bee Z*, which totally impressed me with both the quality of the finish, build and the superb flying experience I got from it.

The Seagull Models Zlin Z-50LS is a larger model, spanning 67.5 inches and falling into the .75 to .91 2-stroke class with a prospective flying weight of 8.6 to 9.7 pounds. For this review, I was provided an E-flite Power 60 brushless outrunner, E-flite 60-amp ESC and an E-flite 6S 5,000 mAh Li-Po. With nearly 1,500 watts of power possible with this setup, I was hoping for spirited performance. Since I find myself

lately moving away from glow due to the mess and cost of fuel, and toward larger electric and gas power, this was right up my alley.

When I began to unwrap the Zlin, I found myself impressed with the covering job (which does represent a few full-scale Zlins). Since the real aircraft was all-metal construction, the majority of the ARF is silver, with some nice red and black trim. What really stood out is that the silver portion has panel lines/rivets and other details printed right onto it. The fuselage is particularly nice, as all of the roundness and curviness of the full-size is well captured in balsa.

As usual, all of the surfaces are pre-hinged and just need glue. Of particular interest is that both the canopy and cowling (which is perfectly painted) arrived wrapped not only in plastic, but also in waxed paper. This is totally appreciated by a modeler like myself, who has pulled scratched canopies out of new kits in the past.

Construction begins by hinging all of the flying surfaces. There were no surprises here. The included CyA hinges are of superior quality, and the pre-cut slots accurately centered. Some precision gluing tips (which I always swear by) make thin CyA drips a nonissue here. It is worth noting that all of the flying surfaces have a fairly dramatic bevel on them, allowing for some serious travel. Being an aerobat, I figured this would come in handy.

Next up is the installation of all of the control horns. All of the Seagull Models aircraft I have worked with have the same style horns, which consist simply of a long machine screw, a few washers and a nut. This

AT A GLANCE

Type:	R/C sport scale
Construction:	balsa and ply
Wing span:	67.5 inches
Wing area:	780 sq. in.
Airfoil:	symmetrical
Length:	49 inches
Weight:	8.9 pounds
Wing loading:	15 oz./sq.ft.
Prop:	EP 9-6
Motor:	.75-.91 2-stroke; .91-1.15 4-stroke (E-flite Power 60 provided for review)
Battery:	6S 5000 mAh
ESC:	60-amp
Radio:	4-channel, 4 standard servos (5 for glow)
Manufacturer:	Seagull Models
Dist. by:	Horizon Hobby 4105 Fieldstone Road, Champaign, IL 61822 217-352-1913 www.horizonhobby.com

setup is both strong and simple to install. I certainly don't miss three-screw plastic horns after working with these!

Powerplant installation comes next. Instructions are provided for both glow and electric power. Seagull Models is most certainly aware of the ever-growing popularity of larger electric-powered aircraft, as a separate radio tray, motor box and battery tray are included for that purpose. A template is included that indicates where to drill the



Unpacking the Seagull Models Zlin reveals an expertly covered model and high quality hardware (above left). Chris used an E-flite Power 60 brushless outrunner, 6S 5,000 mAh E-flite Li-Po, and 60-amp E-flite ESC for power (above right). Rx



is a Spektrum AR7010 DSMX and servos are JR DS821 Digital Sport. A hinged aileron showing the available travel (below left). Note the counterbalance. A typical Seagull Models control horn, here on the rudder (below right).



firewall for your choice of power setup.

Since I was given an E-flite Power 60 brushless outrunner, I went and mounted the electric motor box to the glow firewall with bolts and blind nuts. The "second" firewall of the electric motor box has slots allowing it to be moved fore or aft about 3/4 inch to accommodate electric motors of differing dimensions. For the Power 60, I found that sliding the firewall as far aft as it will go gets you closest to the 140mm distance from firewall to thrust washer dictated in the manual. Included balsa tri-stock is cut to fit and reinforces the firewall with some epoxy.

Next up is ESC and battery placement.

Although the manual suggests mounting the ESC to the outside of the motor box, this does not allow for enough slack in the leads to be able to easily plug and unplug the battery. Mounting it inside the fuse close to the front of the wing saddle is a much better choice. There are enough openings in the motor box to allow cooling air to pass over it. The battery, which in my case is an E-flite 6S 5,000 mAh Li-Po, gets attached to the plywood battery tray. Some self-adhesive hook and loop and two hook and loop straps keep it secure. The tray has a tongue that slips into the backside of the firewall, with the aft end secured with two wood screws for

relatively quick removal for charging.

Fitting the cowl required some minor trimming to clear the landing gear legs. My cordless Dremel with a cut-off wheel made quick work of this. Once fitted with the motor centered in the cowl, I found that one of the lower red stripes did not line up well with the lower painted stripe on the cowl. A simple solution was to trim the stripe on the fuse with a sharp straight-edge razor. Four wood screws hold the cowl on. Note that these only go through balsa sheeting, so hardening the holes with some thin CyA will stop the screws from loosening up.

Back to the wing: I installed the aileron ser-



Seen here is the electric motor mount in bare plywood (above left) with the E-flite Power 60 outrunner bolted to it. Note how the secondary firewall is slid aft

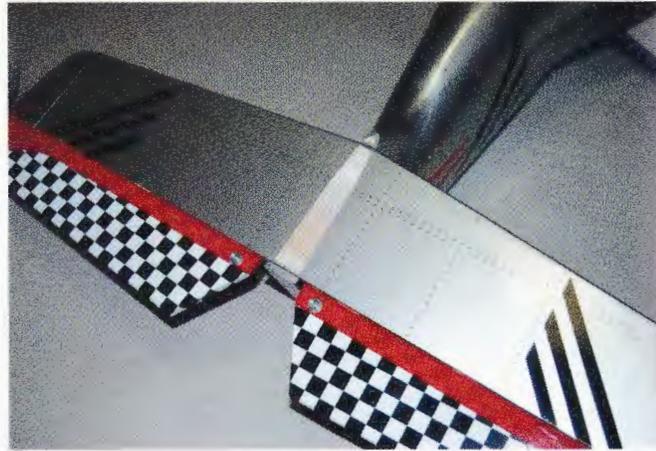


in the notches. One of the JR DS821 servos gets attached to an aileron servo hatch (above right). The mounting points are pre-glued on the hatch.

Zlin Z-50LS



The Zlin utilizes an aluminum wing tube (above left) that allows for the wing to be separated into halves for easy transport. Small machine screws hold the



halves to the tube. The horizontal stab has had the covering removed at its center (above right) to allow adhesion to the fuselage and the vertical stab with epoxy.

vos (JR DS821 digital sport servos in my case). They each get mounted to a flush-fitting hatch to preserve the sleekness of this airframe. These guys provide a healthy 88 ounce-inches of torque on 6 volts, and have given me much trouble-free service in the past. When rigging the pushrods, I found that the longest servo arm provided with the DS821s was still too short to achieve maximum travel.

The wing, which is two pieces, utilizes an aluminum wing tube. While I was expecting to have to epoxy the halves together, I was surprised to find that it is designed to be broken down for easy transport. Knowing this, I found that using one JR Y-harness and one 6-inch extension on one servo allows enough play to slide one wing half off of the wing tube and still be able to plug/unplug the servos. Pre-drilled holes in the wing guide you to drill into the wing tube and thread in two machine screws.

The stabs on the Seagull Models Zlin are now glued into position. Screwing on the wing provides a great point to measure from. I was amazed to find that the horizontal stab, which gets attached first, required no sanding or shimming for a perfect fit. The vertical stab and rudder get attached next. Again, no sanding or cutting was required for a square stab. Kudos to Seagull for having such an accurate fit, as I have had much pricier ARFs that required significant tweaking to square up.

The full-scale Zlin has beefy "Y" braces on

the underside of the horizontal tail, and Seagull doesn't skimp. They come with shortened CyA hinges on each end of the Y, and slide into slots in the stab and fuselage. This is an interesting way to attach a brace, to be sure. The slots are pre-cut in the balsa, and fit well with a slight lengthening of the slot in the fuselage. A few drops of thin CyA hold the struts firmly.

Moving to the inside of the fuselage, a problem was revealed when I tried to fit the radio tray for the e-version. The Zlin has no external hatches, so the wing needs to be removed to get to the battery before and after each flight. This is inconvenient, but I can deal with it. However, installing the electric radio tray per the manual does not leave enough room to install or remove the battery. The radio tray is held in with two machine screws on the aft end, and slots into the fuselage on the fore. It seemed as if the tray is meant to be unscrewed and slid out each time the battery was removed, but with servo pushrods installed and wires run, it was clear that this needed to be reengineered.

A simple solution was to flip the radio tray 180 degrees, so that it now faced aft while still using the same bolt holes. I used a piece of $\frac{1}{4} \times \frac{1}{2}$ -inch hard balsa from my own stock as a brace for the rear portion of the tray. Now, the huge 6S 5,000 mAh Li-Po battery could be installed and removed easily.

The pushrods for the rudder and elevator go in next. Seagull excels here again as the

pushrod guide tubes are preinstalled. Since my radio tray was now about three inches further aft than in the manual some very slight bending was required on the elevator dual pushrods. Everything was moving smoothly and fluidly, so I moved on. The Spektrum AR7010 receiver I was provided with was also installed, with special attention being paid to mounting the satellite receiver properly.

Along with the detailed covering job on the Zlin, Seagull throws in a matching pilot bust. Now I am one of those guys who never puts pilots in his planes, as I normally find them to be rather cheesy looking. But this guy matched the plane and looked so good I couldn't help but throw him in. A plastic instrument panel, complete with maneuver routine, also gets glued into place. The canopy, which is both crystal clear and perfectly pre-trimmed, tops it off. I have never liked using screws on canopies, and whenever possible use canopy glue. Since the canopy fit the contour of the fuselage so well, canopy glue it was. I taped it up and let it dry overnight.

After peeling off the tape and bolting on the wing, I got a good look at the Zlin, and does it ever look sweet. Loaded with curves, huge surfaces and a cheeky cowl, it has a look all its own. Adding to this already stunning model, a pitot tube, antennae and extra decals really polish it off. It is one of those models with so much detail that you really need to look at it for a while to take it



A finished wheel and wheel pant assembly (above left). The installed pilot and instrument panel are a very nice touch (above center). The radio and battery layout in the Zlin, ready for its maiden flight (at right). Note that the radio tray has been flipped over toward the rear to facilitate effective battery access.





PHOTO: JENNIFER ALLAN

Chris's lovely fiancé and flight-shot expert, Jenn, models the Zlin Z-50LS in the bright summer sun (at left). Note the pitot tube on the port wing and antenna aft of the canopy (above).

all in. I installed my prop (an APC 16-8E prop) and the included spinner. As hard as I tried, I could not get the spinner perfectly true and it retained a slight wobble.

Prior to flying the Zlin I did all of the pre-flight checks. First, I weighed it. The weight range in the manual is 8.6 to 9.7 pounds, and, from my experience, that usually tends to be optimistic. Considering that e-conversions tend to weigh more than their glow counterparts, I figured 10 pounds ready to fly was a fair guess.

To my amazement, my Zlin, with battery, weighed in at 8.9 pounds. The recommended rates seemed rather tame for an aerobatic plane this size (10-12 mm elevator, 12-15 mm aileron), so I programmed my JR X9503 with those recommended low and high

rates, plus maximum deflection just to see. With the 6S 5,000 mAh Li-Po as far forward as it would go, the Zlin balanced just slightly aft of the recommended starting point.

Time to hit the field! As I had anticipated, bringing an airplane stand (in my case an inexpensive foam Robart job) was invaluable when handling the Zlin and installing the battery, since my other option was to lay it on the ground. Once armed and ready, I performed some quick taxiing tests. Although a little touchy, it tracked well. Time to go for it!

With my timer set at 7 minutes, lift-off was achieved at a little over half throttle. Just a few clicks of up elevator had my Zlin flying level hands off. Some quick hands-off inverted flying showed that the c.g. (which

was slightly further aft than called for) was just about right for my tastes.

I was quick to find that, because of the necessity of flying shots, the Seagull Models Zlin Z-50LS's low-speed characteristics are excellent. With all that wing area, tight, banked turns at very low speeds were no problem with no tendency to snap out. This was surprising, as the Zlin is rather short coupled. As I had expected, the recommended rates are very humble (for me) with maximum travel more befitting an aerobat like this. I even plan on fitting my Zlin with extra long servo arms to make full use of the travel available in the surfaces.

The power to weight ratio with the E-flite Power 60 was very good, with unlimited vertical performance on tap. The large 16-8 prop provides plenty of torque and thrust for hovering, snaps and torque rolls. The Zlin lands as nicely as it flies, with no tendency to drop a wing or do anything unexpected. I put two flights on the Zlin on maiden day with a total flying time of about 8 minutes. Post-flight charging showed that this only took about 1,800 mAh out of the 5000 mAh pack.

Overall Seagull Model's Zlin Z-50LS is not only a great looking model, but is a truly excellent flier. It has everything you would want in a sport-scale aerobat; it flies light, tracks on rails, and you can really throw it around when jamming the sticks. The only complaints about this ARF would be that the spinner is difficult to get true (I will end up replacing mine) and that the thin black plastic instrument panel distorts almost immediately in direct sunlight. Other than that, you will be hard-pressed to find a model that looks and is as capable as the Zlin is. This is my second Seagull Models plane, and I can say that they really delivered a winner. ☑

PHOTO: JENNIFER ALLAN



The Zlin Z-50LS has all the flying characteristics you'd want in a sporty low-winger. Superb low speed handling, precision control at speed and plenty of surface area for wild aerobatics...all in a great looking package!

Small **Talk** by pat tritle

You can reach **Pat Tritle** at 10313 Snowheights NE, Albuquerque, NM 87112 or via e-mail at patscustommodels@aol.com

One of the things that I've noticed with smaller models is that in an attempt to keep things light, we avoid adding a lot of detail. Actually, a fair amount of detail can be added without a significant weight gain. There are lots of things out there that can be used that are not only very light, but are also easy to obtain, and they don't have to be expensive.

Adding cockpit details

The main area we tend to avoid is the cockpit. I know I'm as guilty as anyone of this, but adding a pilot is the quickest and easiest way to bring your model to life. It can be as simple as taking a profile photo of yourself against a plain backdrop from mid torso up and sending it over to Callie at www.calliegraphics.com with a height dimension and have her print them on vinyl in mirror image so you'll have both sides. Then stick the vinyl onto clear acetate, cut it out and mount it in the cockpit. For something a bit more 3-dimensional, Sparky has vac-formed pilot busts in several sizes and types on his web site at www.parkflyerplastics.com.

Next up is the instrument panel (IP). You can take a photo of a panel, print it to size and stick it to the IP bulkhead in the model. For something a bit more sophisticated, you can build up a layered panel using styrene plastic or 1/64-inch ply. Cut holes in the panel, then back it with clear acetate and glue the instrument dials to the back. A quick Google search will bring up several reference sources for dials and panels.

The switches, buttons, throttle levers and such can be made up from various sizes of brass wire, styrene rod, or pins with the appropriate size ball ends. Drill the panel with a pin vise and glue the pieces in place with white glue. You can even add small ball ends with a drop of white glue such as Liquid Stitch or Tacky Glue. Then once the panel is completed it can be glued in place on the IP bulkhead.

Now, if you're looking for a full cockpit arrangement, make the floor from the ap-



PHOTO: BILL BRADLEY

Bill Bradley's original design Halberstadt CLII is living proof that just because a model is small doesn't mean that it needs to lack detail to fly well.

propriate thickness of balsa or Depron® foam. The rudder pedals can be made from either Styrene sheet or rod stock, or aluminum tubing. Same goes for sticks or yokes. There are several different shapes and styles throughout the industry, so look for photos of your specific airplane and work from there. They don't have to be exact, a good approximation is close enough, so apply your "artist's license" as anything is better than nothing.

And last but not least are the seats. For those, Depron® or blue foam would be an excellent choice. Carve, or better put, *sculpt* the seat cushions using a good sharp X-Acto knife and medium grit sandpaper. Once the seats are shaped, add the piping around the edges with styrene rod or fine insulated electrical wire. Seal the foam with a coat of water based varnish and paint with something like Model Master acrylic paints or artists acrylics to finish them up. They won't weigh anything, and will look terrific.

Then to put it all together, make up the pedestals for the seats with anything that works, glue all the components in place, and mount the assembly into the fuselage. Mounting the assembly can be a bit cumbersome, so plan ahead and don't finish the fuselage beyond your ability to access it and add the cockpit during the framing process. Or, mount the floor board first, and assemble the components in the fuselage after the basic framing is done.

In the words of that famous philosopher Red Green, "it's just that simple". However, like every other modeling skill that we have acquired over the years, adding these kinds of details does take some practice to perfect, so take your time to develop your own techniques and see what you can come up with.

Builders are busy building

Considering that we're not into building season yet, there's been a lot of building going



PHOTO: DAVID PAYNE

David Payne built his C-172 in the lesser known T-41 variant (above left). The markings are homemade on an ink jet printer, and the prominent corrugation on the flying surfaces was represented with artists paper. Again, big detail with only a small weight penalty, and flight times are still 30 minutes with a 1600 3S



PHOTO: LEN ROZAMOS

battery. **Len Rozamos** built his T-6 *Texan* (above right) from the old Housh Balsa kit. A Rubber Maid bowl serves as a cowling around the Irvine .20, quieted by a Tatone manifold style muffler. And the bright color scheme should keep the model in plain view against the bright sky backdrop.



PHOTOS: JOHN POMROY

John Pomroy really nailed that "classic model airplane" feel with the sun shining through the translucent cover of his Dumas Taylorcraft (**above left**). Somehow that freeflight style structure coupled with modern electronics is the



perfect mix of the old and new. Biplanes have a style all their own, and there's just nothing like the elegant lines of the Waco ARE (**above right**). John Pomroy's Dumas ARE really captures that classic style of a by-gone era.

ing on. There's some terrific stuff come our way this month, so let's get started.

We'll begin with David Payne's 1:8 scale Cessna T-41 built from the PCM C-172 short kit. The 53-inch span model has an all-up weight of 25.6 ounces using a Turnigy D2830-11 1000 K_v motor, 20A Turnigy ESC and an APC 9-6 prop. Cover is UltraCote Parklite with decals made on an ink jet printer on white tissue paper and mounted with polyurethane varnish. The corrugated panels are fabricated from artist paper. Antennae are made from miniature steel control cable so they're flexible and won't break off. Servos are HXT900 9g with the pull-pull system made from Spider line. Flight times are about 30 minutes with 1600 3S battery. Very nice, and definitely not a color scheme you see every day.

In a completely different vein we have Len Rozamos' T-6 *Texan*. Len just finished the model from the old House of Balsa kit, and used a Rubber Maid #7 container bowl for the cowl. Power is provided by an Irvine .20 with a Tatone Manifold muffler. If the T-6 flies half as good as it looks it'll no doubt be a real jewel.

Next up we have the Taylorcraft and Waco ARE from John Pomroy, both built from Dumas kits. The 40-inch Taylorcraft

came first, built last winter. A FrSky 2.4G 4-channel Rx and two 9-gram HXT servos guide the model, powered by a Hextronik 16-gram 1700 K_v outrunner with a 6A Turnigy Plush ESC. Power is from a 2S 360 mAh Rhino Li-Po battery. Covering is Litespan. The model tips the scales at 6.4 ounces with battery with durations of around 10 minutes. John has about 50 flights so far, mostly in the front yard, and it flies wonderfully.

The second project is the 35-inch Waco ARE, recently finished with only about five flights logged. Again, the FrSky 2.4G 4-channel Rx was used, along with a Hextronik 24-gram 1300K_v outrunner, a Turnigy Plush 10A ESC and a 3S 500 mAh Zippy Li-Po battery. A pair of 9-gram HXT servos run the rudder and elevator controls. Covering is Microlite with Krylon paint for blue trim. The model flies for nine minutes on a charge and weighs 9.5 ounces ready to fly. Like the Taylorcraft, the Waco flies beautifully. Very nice!

And then we have Bill Bradley's original design Halberstadt CLII. This model just goes to show you just how detailed a Park Flyer can be. The 40-inch model is powered by a Rimfire 10 with a 35A ESC, 10-5 prop and a Rhino 1750 mAh 3S battery. Guidance is by way of HXT900 servos with pull/pull

control for the rudder and elevator. Flying weight is 44 ounces.

Cover is Polyspan with printed tissue over the Polyspan. The fuselage was airbrushed with latex. The engine and cowl are vacuum formed units from Park Flyer Plastics, and short kits for this incredible model are available from www.manzanolaser.com.

Then we have Robert Miller's 40-inch *Airtractor* built from an original PCM plan. The model is powered by an E-flite Park 250 outrunner, 10A ESC, and 7-3.5DD prop with a 400 mAh 2S battery. Cover is Coverite Microlite, and at 7.5 ounces the little 4-channel duster flies really well.

And last but not least is Tony Moore's Curtiss-Wright XP-55 *Ascender*. It's no secret that Tony has a flair for the unusual, and this model is no exception. This is the prototype for Tony's design, and looks like it's going to be a good little flyer. The model has gone together quickly, and we'll definitely keep you posted with more on this very unusual model as things progress.

Well guys, this one filled up quickly, so till next month, keep the terrific projects coming. And for you bush pilots out there, next month we'll talk a little about the techniques used to side slip your model into a short field. **CC**



PHOTO: ROBERT MILLER

Robert Miller's 40-inch span *Airtractor* (**above left**) looks right at home at the local **strip**. And in keeping with a good scale appearance, the battery loads through the chemical hopper door in the scale location. Tony Moore has been a bit notorious in his choice of unusual airplanes. The way Tony sees it, if nobody



PHOTO: TONY MOORE

else does one, do it yourself. And that's just what he did with his Curtiss-Wright XP-55 (**above right**). This is the prototype for Tony's design, and it looks like it's going to be a good little flyer. Tony's track record is pretty good, and Pat can't wait to hear how this one turns out.

F/F Sport

by Larry Kruse

You can reach **Larry Kruse** at 18 NW Heatherstone Drive, Lawton, Oklahoma 73505, or via e-mail at aircats@att.net

"I am all about recycling my old things and finding new and interesting ways to use them."—MAURIZIO MARANGHI

This month's column is loosely arranged around how we make use of models that have been with us for some time, but continue to bring us pleasure for their simplicity, durability, and potential for adaptation.

John Krouse has been a frequent contributor to these pages with his elegantly tiny models that use cutting edge electronics as their propulsion systems. This month, John has re-cycled his semi-scale 1913 Rumpler *Taube* from its original existence as a rubber-powered No-Cal to an electric powered indoor ship. Built as a traditional No-Cal with a profile fuselage and single-covered surfaces, John's *Taube* served him for several years as a rubber band powered indoor ship.

His electric conversion extended its life by the substitution of a 6x12 pager motor for its original loop of rubber. The mini-motor spins a direct-drive BP 56 mm diameter prop, trimmed to 51 mm (two inches). The flight profile is controlled using a 2-function (speed and duration) Nick Leichty electro-mechanical timer, manually adjusted prior to launch. The motor starts "about 5 seconds after the 50 mAh Li-Po Bahoma battery is magnetically attached to the DIDEL connector." John's 16-inch span *Taube* now weighs 10 grams with its new power system.

Several interesting low-tech features of the conversion are shown in one of the accompanying photos as John used a paper clip as the motor mount for independent adjustment of side and down-thrust angles, and two rubber bands and a piece of office tape to keep the wires snug to the fuselage! Readers interested in following John's lead can find the necessary electronic parts from Bob Selman at www.BSDMicroRC.com and at Nick Leichty's web site www.MicroFlierRadio.com.

Paper airplane propulsion

Reader Carl Dowdy of the Carolina Area



PHOTO: JEFF ENGLERT

Jeff Englert built this nicely done Taylorcraft BC-12 from fellow club member Bill Schmid's plans. The plane spans 30 inches and features a 10-inch Paulownia wood prop up front.

Free Flight Association (CAFFA) had an "Aha!" moment recently when he stumbled onto our next item while surfing the web. The "Power Up" electric power module provides a pusher propulsion unit for one of the oldest and most revered flying models—the paper airplane! While paper airplanes have been part of everyone's life while growing up, the only practical power solution has been the time-honored hand toss to get them in the air.

Now, Tailor Toys' electric power module for paper airplanes provides what appears to be a viable alternative, complete with both a construction (if you can describe folding a paper airplane with that term), and an action video on their web site with its accompanying links at <http://www.tailor-toys.com>.

The conversion kit consists of a capacitor that clips onto the plane's nose, and a pusher propeller that is mounted at the end of a carbon fiber shaft running along the bottom crease of the fuselage. The capacitor accepts a 20-second charge from a separate battery pack containing three AA batteries. One

charge provides approximately 90 seconds of run time.

The inventive nature of the freeflight community will immediately see uses for this power unit beyond paper airplanes, I'm sure. Given that it won't take modelers long to figure out how to reverse the unit's polarity, both tractor and pusher applications will be standard in a very short time.

Apparently, the units are primarily being sold on e-Bay and Amazon, but there is a special price of \$17.49 from Tailor Toys here in mid-August as this is being written. Check out their web site for current pricing. I'm looking forward to publishing a photo or two of someone's adaptation of this new power system to one of their stick and tissue models. Thanks, Carl, for passing the information along!

Charles Hampson Grant

Charles Hampson Grant was both a pioneer and an icon of model aviation in its earliest years, noted for his extensive writing about model aerodynamics and model airplane design. He became the editor of the

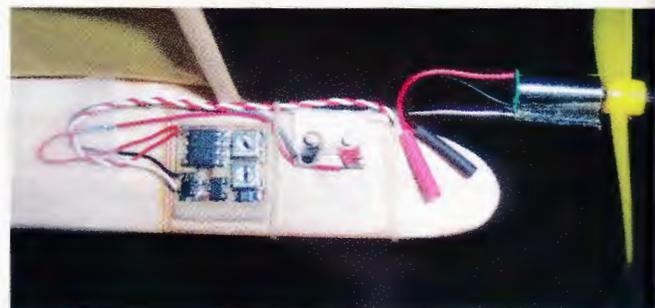


PHOTO: JOHN KROUSE

John Krouse re-cycled his traditional stick and tissue semi-scale Rumpler *Taube* No-Cal (at left) by using miniature components to change it from a rubber-powered ship to an electric one. The close-up photo (above) shows the arrangement of the timer, connector, and the motor mounted on a paper clip for easy thrust adjustments.



PHOTO: BILL HANNAN



PHOTO: CAITLIN HANNAN

Bill Hannan's venerable Peanut-size *Cloud Tramp* rests atop his son, Ken's, full-size model (at left). Both were flown in the 17th Annual *Cloud Tramp* World-Wide Mass Launch dedicated to the achievements and memory of Charles Hampson Grant. Granddaughter Caitlin Hannan catches her grandfather Bill's Peanut-size *Cloud Tramp* (above) as it climbs for altitude during this year's 17th Annual *Cloud Tramp* World-Wide Mass Launch.

fledgling magazine *Model Airplane News* in 1932 and boosted its circulation from 21,000 to over 300,000 readers when he handed over the reins in 1943. During that time he published his book, *Model Airplane Design*, and also published his best known design, the *Cloud Tramp*.

Some seventeen years ago, Canadian Jim Moseley organized a postal contest in honor of Charles Hampson Grant using the *Cloud Tramp* as the subject of a most unique and simultaneous world-wide mass launch on a specific day in both hemispheres and across all time zones. This year's organizers, Pete Money in this country and Mike Parker in the UK, set the event for Saturday, August 6, 2011 with a launch time of 1700 hours British Summer Time (GMT + 1 hour), which translated to 1200 hours Eastern Time and 0900 hours Pacific Time in the US.

Bill Hannan was kind enough to send this entertaining account of his family's participation in the event. "Our crew consisted of son Ken, granddaughter Caitlin, Joan and yours truly. We had perfect weather with zero wind at the school athletic field, however two unanticipated problems materialized: While we were practicing, two dogs—one large and another tiny and speedy—appeared and showed excessive interest in our activities. Fortunately, their mistress was friendly, understood our apprehensions, and took her mascots elsewhere.

"The next potential problem was the automatic sequential watering system, which began approaching us disturbingly close to the 9 a.m. launch time! Luckily we managed our flights before getting wet, but with little time to spare..."

Bill says the two photos he included show Ken's full-size *Cloud Tramp* with his Peanut version setting on top of it. Beneath them are two photos taken by John Worth, showing the late Charlie Grant enjoying himself, "joyfully launching one of his originals." The second photo, provided by Bill Warner, is of the Hannan Peanut version in flight and was taken by the Hannan's granddaughter, Caitlin.

At this point in the 2011 *Cloud Tramp* mass launch reporting process, 118 people world-wide have turned in their flights, representing Australia, Canada, the Czech Republic, France, Germany, Sweden, and the USA.

Just for fun

Mentioning the joy evident in the face of Charles Hampson Grant, encapsulates what freeflight is all about. The last two photos illustrate both the joy of creation and the joy of flying a venerable design for over two decades. The photo of the nicely built and finished Bill Schmidt-designed Taylorcraft BC-12 is the work of Jeff Englert, the editor of the Wichita Historical Aero Modelers

(WHAM) club's newsletter. Jeff sent it along as evidence that "someone else in Wichita builds models", other than Bill, whose work has been featured here on many occasions. And, while Jeff's creation is new, it has every chance to stay in his flying stable for a long time.

The second photo is from competition/duration flyer, Mark Troutman, down in south Texas who says, "Yesterday I went out and flew my 1942 Earl Stahl *Ercoupe* powered by an OK Cub .14—no timer, just fill the tank—and it goes for about 45 seconds." Mark built the model over 20 years ago and usually flies it in the mornings in calm air.

"It flies slowly," he relates, "and in tight circles like a control line model. It never seems to get higher than 100 feet, after which it just rolls out and lands beautifully on its tricycle gear...It was built strictly for fun and after 20 years has more than lived up to the designer's and builder's goals. Take a tricycle gear low wing twin rudder freeflight model out to the field and watch all the contest boys stop what they're doing and watch...free-flight the way it was meant to be. Pure fun."

That's a great way to finish up this month's column. We'll get back together again next month with some more outstanding models, building tips, and projects for your workbench. Happy Thanksgiving to everyone!



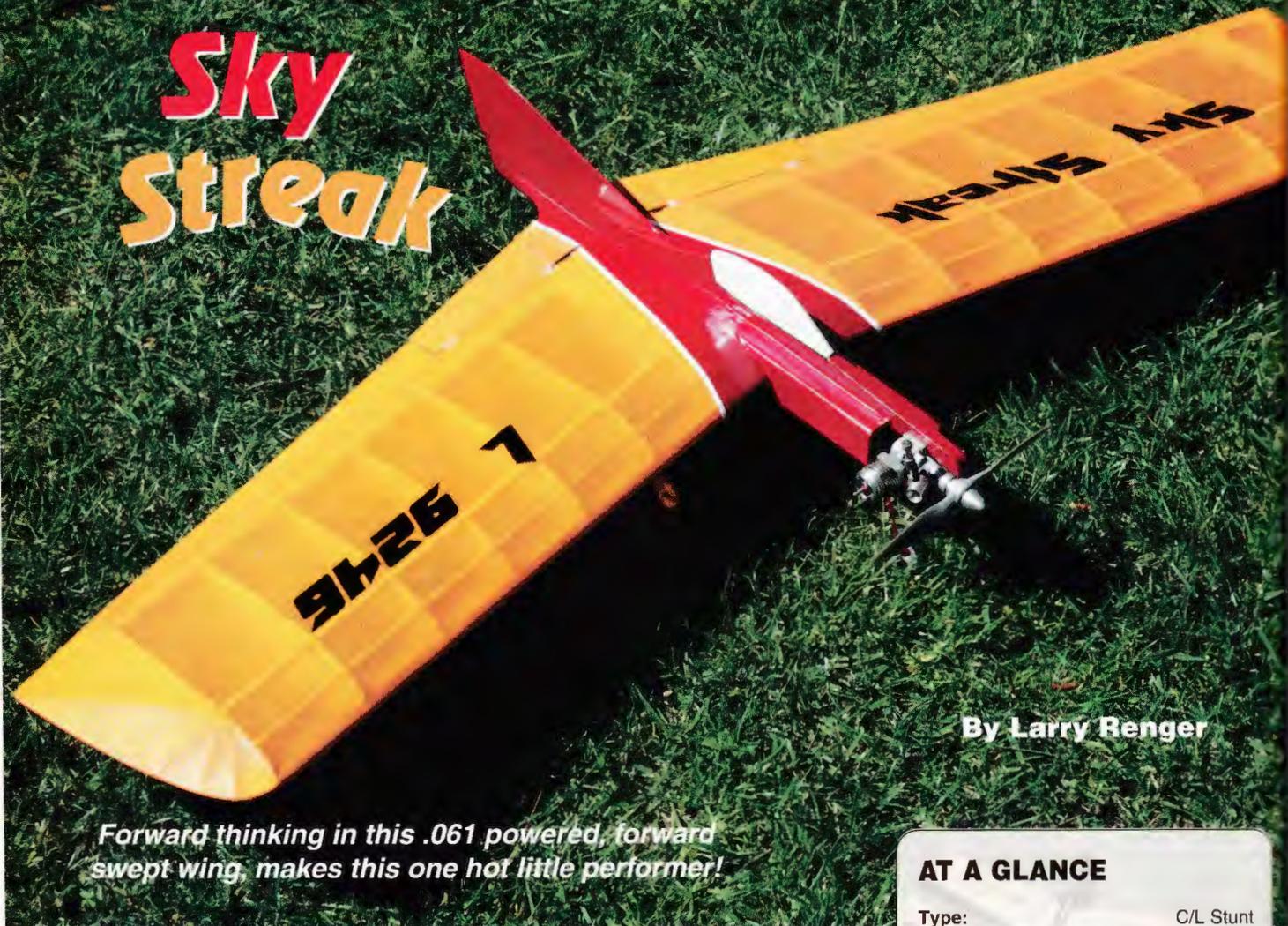
PHOTO: MARK TROUTMAN

Competition flyer, Mark Troutman has enjoyed leisurely flights with his Earl Stahl designed, *Ercoupe* (above) for over twenty years. The model is powered by a venerable OK Cub .14, which provides just enough power for realistic early morning flights before the breeze comes up. Taylor Toys is the supplier of a new integrated propulsion module consisting of a capacitor, motor, and prop intended to power traditional paper airplanes, but offering many other possibilities for small electric freeflight models (at right). Details in the text.

PHOTO: TAYLOR TOYS



Sky Streak



Forward thinking in this .061 powered, forward swept wing, makes this one hot little performer!

PHOTOGRAPHY, LARRY RENGER

By Larry Renger

About 50 years ago, Larry Scarinzi published a design called the *Streak*. It was in published *Model Airplane News*, an outstanding general purpose model magazine at the time. His *Streak* was an Atwood Shriek powered, forward swept, flying wing sport model. I was 15 at the time and fell in love at first sight!

Well, over the years, I have knocked off the design in various forms and sizes. About eight years ago, I won a Brodak *Little Lightning Streak* kit in a club raffle. Our Rafflemeister, Mike Fox, proposed a prize for the best model built from one of the kits at that particular Christmas Party raffle. I thought the basic kit was *boring!* So, I cut the tail off and modified it to be a forward swept flying wing, the *Frite Streak*. Power was a Golden Bee .049, and the performance proved excellent. Who'd a thunk?

Well, thus encouraged, I enlarged the model from 150 square inches to 180 square inches, improved the structure, powered it with a Black Widow and won a 1/2A contest at Woodland, CA. It took two pit stops and I had one second left on the time, but made it! Having Brett Buck for pit man may have helped the image.

Further stoked by this performance, I decided to "*do it right*". What is presented here is the third variation on a theme, and it is just getting better and better! This model

was designed from the ground up to use the AP Wasp .061 that has proven a competitive powerplant in 1cc and Leprechaun aerobatics. The power is reliable and awesome; the durability of the engine is enhanced by bronze bushed crankcases. To me, it is the engine for small Stunt.

The size was boosted to 250 square inches and the fuselage redesigned for beam mount engines and floppy balloon tanks (more on them later). Final result is a model that weighs in at 7.4 ounces dry, sports a 37-inch wingspan and flies on 48-foot x .008-inch steel lines.

Yes it flies, no it isn't hard to fly, and yes, you really need to have one of your own! It does the full aerobatic pattern in a manner such that only the pilot is the limiter on possible score. You can see all three models in one of the photos and get an idea about the trend in size and power.

The reasons for the exceptional performance are a variety of benefits from the forward swept configuration. First, forward swept wings initially stall from the center. It is almost impossible to stall the tips in normal flight. No weird tip wiggles and you can drive the wing to its limit of performance.

Second, the sweep lets you have a reasonable nose length to allow for an engine and tank. The balance point is ahead of the wing leading edge. Third, with wing area both for-

AT A GLANCE

Type:	C/L Stunt
Construction:	balsa and ply
Wing span:	37.5 inches
Wing area:	250 sq. in.
Length:	11.5 inches
Weight:	7.5 ounces (dry)
Wing loading (3D):	.0008 oz./cu.in.
Engine required:	.061-.049
Lines:	42-48 feet

ward and aft of the c.g., the model is well damped against hunting. It turns hard but then stops without a bobble. As a result, the *Sky Streak* is remarkably smooth. Next, since the center section is in the rear, the rear mounted elevator is very effective without creating a lot of drag with excessive deflection. Last, but not least, in the air, it looks *way cool*.

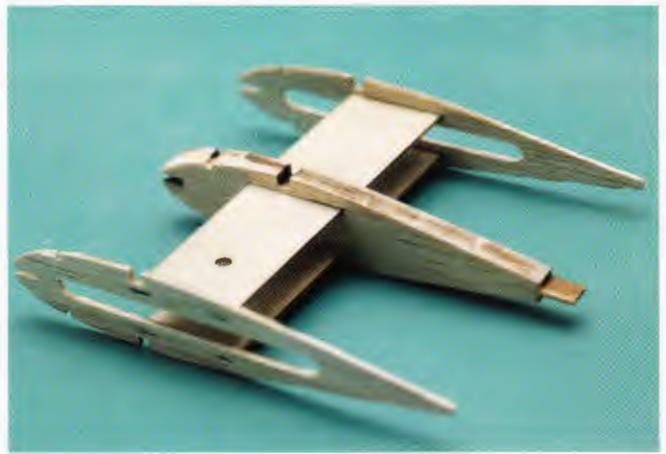
The odd thing is that I have never built an exact replica of Scarinzi's original design. I do, however, have a copy of the plans and article for a "someday" project. And I have a *very hot* Atwood Shriek to put on it.

To the bench

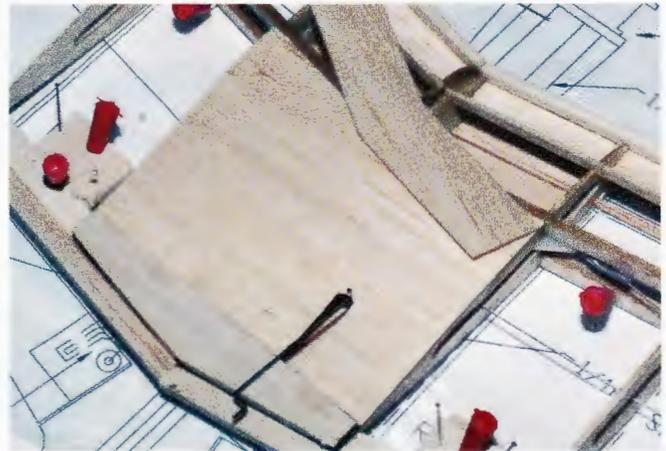
Let's prepare all the parts for assembly. Identify them all so that there's no chance for mis-assembly.



Three stages of development (above left) from casual fun model to competitive 1cc aerobatics. Counter-clockwise from bottom right, 150 inches²/Golden Bee, 180 inches²/Black Widow and finally the 250 inches²/.061 "beast". The center module (above right) is the heart of getting all the alignments right on this model. Bellcrank installation at this stage is easy. The bellcrank goes on the



inboard side and the pushrod out the bottom! Supporting the trailing edge/flap (below left) with lots of weights assure correct alignment. Re-align inverted when doing the bottom sheeting to assure the straightness is locked in. Two details worth noting (below right): the way the sheeting is cut to fill in between the spars and the filler blocks at the trailing edge center for extra strength.



Glue the eight pieces of trailing edge levers together so that each of the four supports has the grain in crossed orientation for plywood-like strength.

Laminate the left wing tip from four pieces with the cut pieces in the center to allow the leadouts to pass through.

Assemble the tip weight box. Assemble the leadout guide.

Prepare the bellcrank with the inner leadout ends and the pushrod. Install this assembly on top of one of the 1/32-inch plywood sup-

port plates. This plate will be the lower one. Look at the cross-section of the fuselage center to see how the nuts and bolts go together. Use nylon locknuts to hold the bellcrank in position on the bolt. Leave a slight amount of slack so the bellcrank rotates freely.

Assemble the two elevators with their 1/32-inch ply cover panels. The left one also has the control horn glued to it. Study the plans carefully and get all the orientations right. This is a "do it once, do it right" situation that can't be easily fixed!

Wing construction

Slide rib R4 onto the center of the two bellcrank support plates. The bellcrank goes on the left side. Set ribs R3 onto the ends of the ply support plates. Square it up and glue the ribs to the plates.

Bevel the center portion of the lower 1/4 x 3/16-inch spars and pin over the plan on your building board. Place the center rib/bellcrank assembly onto the spars. Add all remaining ribs. The pushrod is to come out the bottom of the wing.



The bellcrank is entrapped on a long screw (above left) and positioned with nylon locknuts over and under. Leave just enough slack for free movement.

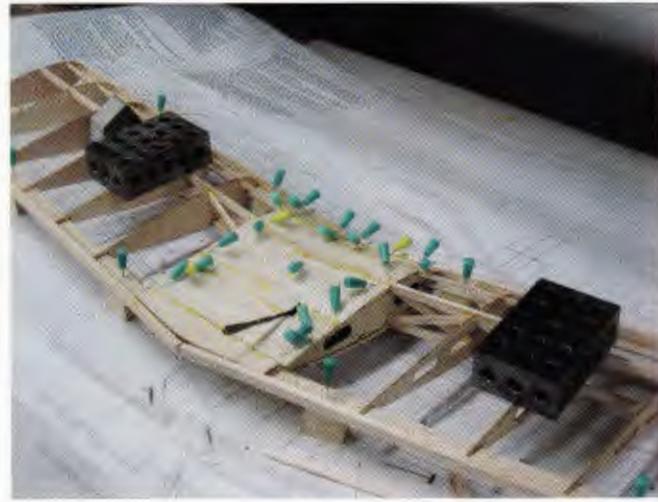


Pins! You gotta love 'em. You certainly can't use too many (above right). Since the sheeting has to form compound curves, make sure it stays put.

Sky Streak



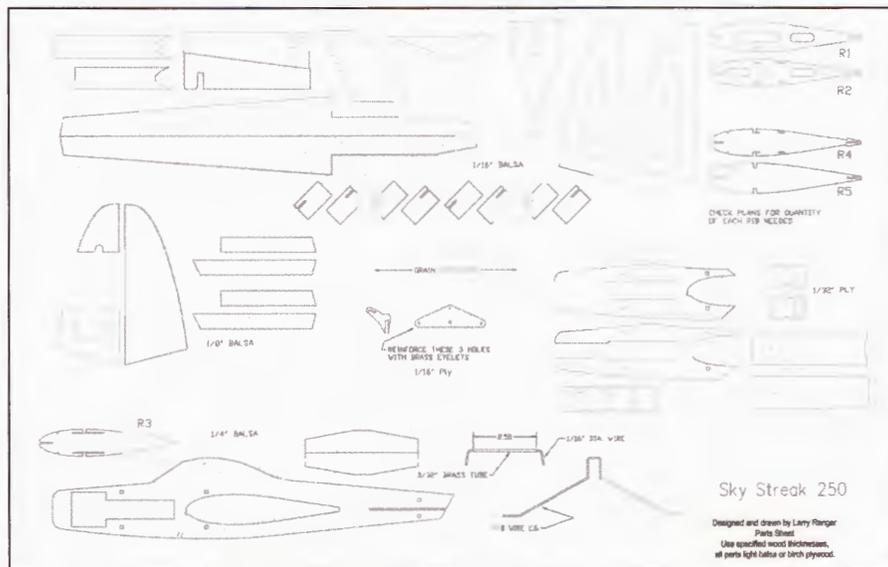
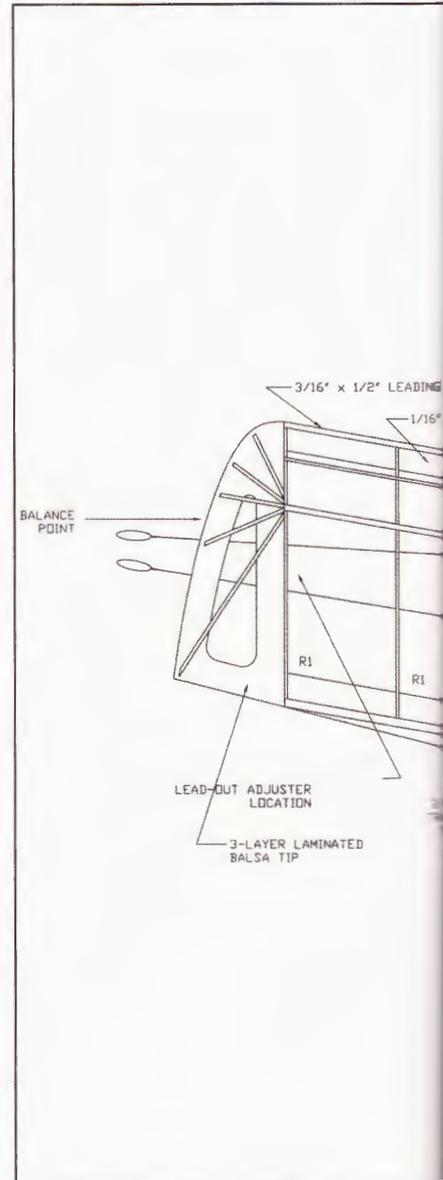
Purty, ain't it? Drill all holes (above left) for landing gear and engine mount before further assembly. It makes life *much* easier! Alignment is everything.



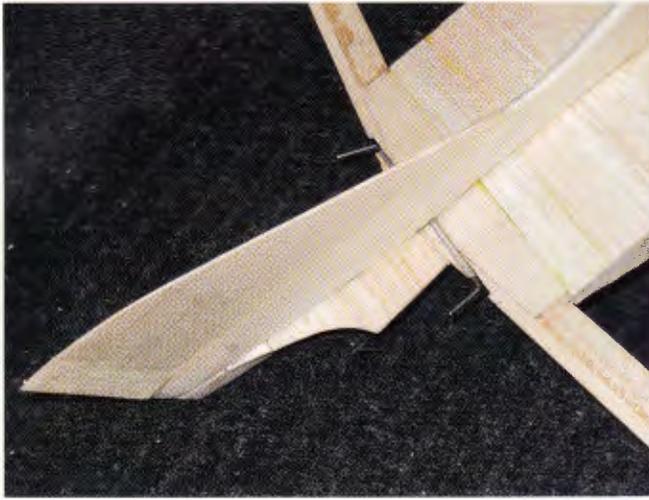
Note how the trailing edge is blocked up (above right) for alignment and the cross bracing on the spars, plus lots of weights.



Pretty well framed up and getting there! Trike gear, as is evident here from the nose gear leg, didn't work out at all, so the model was later converted to conventional gear and tailskid.



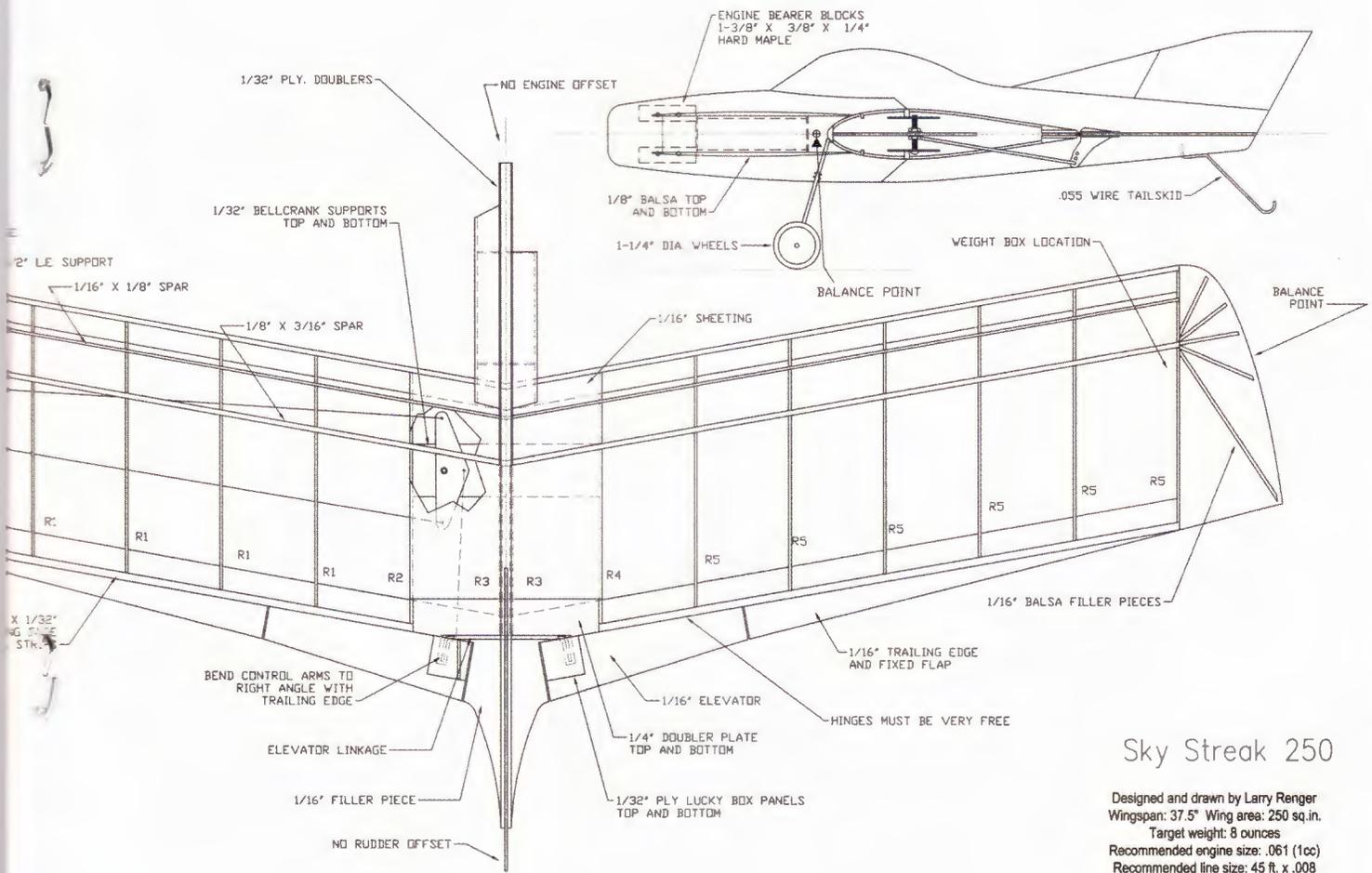
Full Size Plans Available Through Carstens Flying Plans



To make the tail look prettier, Larry added some fillets to eliminate the gap between the tail and the wing (above left). Note also the trim tab on the rudder.



"Lucky Boxes" (above right), named for Lucky Pyatt, the inventor, allow smooth control even with well angled hinge lines. No noticeable slop, either.

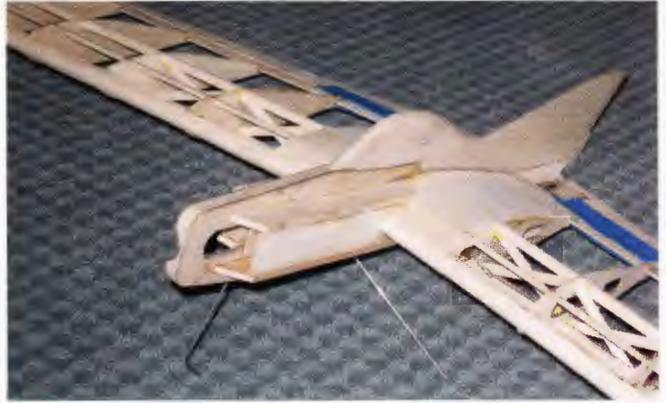


Sky Streak 250

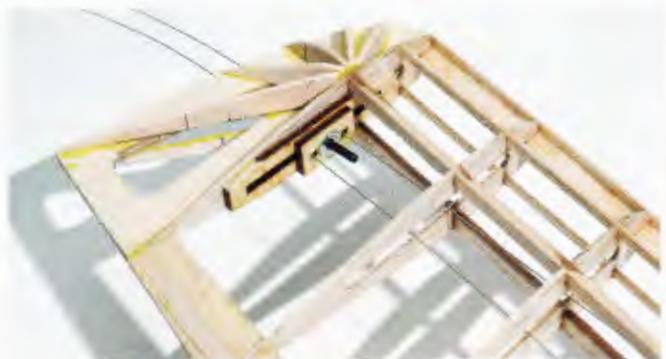
Designed and drawn by Larry Renger
 Wingspan: 37.5" Wing area: 250 sq.in.
 Target weight: 8 ounces
 Recommended engine size: .061 (1cc)
 Recommended line size: 45 ft. x .008

Order Plan CD428 for \$14.00

Sky Streak



The final configuration that Larry settled on for the SkyStreak was a simple music wire tail skid (at left, top). That cowl (above) serves as a balloon fuel tank compartment and really stiffens the nose of the model. An adjustable lead-out guide (below) is a must have on any competitive Stunter. Same with adjustable tip weights. A bit of sanding is needed to make a clean match (at left, bottom) of the top and bottom of the cowl to the wing, but it is worth the effort in how it looks and ties to the wing structure.



Add the top $\frac{1}{8} \times \frac{3}{16}$ -inch spars, again with the centers beveled. Align and square up all the ribs. Add the $\frac{1}{16} \times \frac{1}{2}$ -inch leading edge support and the trailing edge/flap pieces. Block up the trailing edge with the levelers constructed in step 1. Make sure all the ribs are exactly over the lines on the plan and vertical. Glue all the joints.

Add the $\frac{1}{16} \times \frac{1}{8}$ -inch spars, $\frac{3}{16} \times \frac{1}{2}$ -inch leading edge and $\frac{1}{2} \times \frac{1}{4}$ -inch trailing edge doublers. These must all be tapered neatly to meet in the center.

Glue the leadout adjuster to the tip rib as

shown. Glue them top and bottom at the center of the trailing edge.

Sheet the top of the wing center section with $\frac{1}{16}$ -inch balsa between the spars. Remove the wing from the building board and sheet the lower center section with $\frac{1}{16}$ -inch balsa to match the top.

Carve and sand the leading edge and the trailing edge to shape. The trailing edge should end up blended into the flap thickness. Trim the center of the trailing edge to match the doubler plates that were added previously.

Fuselage assembly

Pay attention here! Using $\frac{1}{8}$ -inch square pieces of balsa through the matching holes, laminate the two fuselage sections and the $\frac{1}{32}$ -inch plywood doublers. You also have to insert the two maple motor mounts into their slots and get it all aligned. Use really slow epoxy both for working time and better wood penetration. Weights on the assembly will assure a good bond. Drill the engine mounting holes and carve out the engine area wood as needed to fit the engine.

Add the $\frac{1}{16}$ -inch trailing edge filler piece.



The forward sweep has many good aerodynamic functions (at left). See the text for the details. Looks mean in the air too! Floppy balloon tanks (above) have been around since Jim Walker and the Firebaby in the '40s. They still work fantastic for stunting. Assembly details in the text.



PHOTO: CHARLES OSBORNE

AP Wasp .061 and venturi by Jan Holuszko (at left), combined with a floppy balloon tank give flawless Stunt runs with amazing power. Only needs 10% Nitro, too! Stan Tyler (above) pits for another great flight. Acceleration is quick!

Also slip the control link into the slot. Mount the landing gear at this time; it gets locked in by the wing.

Slide the wing into the fuselage and, after making sure of perfect alignment in all directions, glue it in place. Glue the control link in place between the wing and the filler.

Assemble the cowl/tank compartment. The hole in the support goes on the outboard side in front. Add the vertical tail. Hinge the elevators in place.

Be sure the bellcrank is centered and the elevators clamped in place level. Bend the pushrod to go through the control horn. Use a wheel keeper or soldered washer to lock it in place.

Cover and finish the model. Mine was covered with Coverlite and painted with Rust-O-Leum as a final finish over butyrate dope used to seal and fill the wood.

Balloon tank

This model is designed to use a floppy balloon tank. You can substitute a hard tank or pressure bladder of course, but the balloons are simple, cheap and reliably provide clean fuel flow no matter what.

Make an assembly of fuel hose and brass tubing as shown. The holes in the rear tube are to assure that the pickup tube can't be blocked by the balloon. Take a 9-inch balloon

and blow it up as hard as you dare. Tie it off and leave it for a couple of days. This gives you more capacity and a more flexible balloon. Cut the end off the balloon where it was tied and use wire to bind the end over the fuel hose where the brass tubing provides support. When using the tank, first pull all the air out of the balloon and then fill it. A 2-ounce syringe works great for this.

Flight Trim

The first thing to do is to select the correct lines for the power level that you are using. My guess is that the following engines will fly the model well if you set the line length correctly. I have included a table of my best guesses; don't sue me if they aren't right on.

Next, the handle is of critical importance. I (modestly) suggest the Ultimeter Handle from rsmdistribution.com. It is designed to work with small bellcranks and provide exponential control to smooth the level flight an unflapped model while still giving a serious kick for the square corners. Otherwise, use about 2.5-inch line spacing on a standard handle for starters.

The key items to achieve optimum performance on this model design are the c.g., the pushrod length, the tip weight and the position of the leadouts.

Conclusion

The *Sky Streak* isn't a difficult model to build, and it will provide pilots at every expertise level the opportunity to improve their piloting skills with minimal expense, using a model that takes up a remarkably small amount of space and investment. Adjusting the line length to the power available allows extremely flexible usage. The model will turn competitively on most line lengths, just select a power package, and then adjust the lines to suit.

So far the *Sky Streak* has five trophies as flown by four different pilots! Build one and add to the total. A short, laser-cut set of parts is available from rsmdistribution.com.

If I can be of any assistance, feel free to e-mail me at larry_renger@earthlink.net.

Suggested Set-ups

Engine	Line Length
Norvel and AP Wasp .061	48 feet
Norvel .049, Tee Dee .049, Brodak .061	45 feet
Brodak .049, Medallion .049	42 feet



PHOTO: CHARLES OSBORNE

Straight and true on the lines is a function of accurate building. This plane is fully competitive with five trophies so far. The model is quick, getting good in-flight photos needs a fast finger and good camera.



Electric *Flight* by stew meyers

You can reach **Stew Meyers** at 8304 Whitman Drive, Bethesda, Maryland 20817, or via e-mail at stew.meyers@verizon.net

E-flite has come out with another couple of ultra micro models, the ultra micro *Pole Cat* and the UMX Sbach 342. The *Pole Cat* has an 8.5 mm brushed motor and is based on the modified Cassutt Formula 1 racers. The solid foam wing is quite strong like the Sukhoi's, but the airframe is much smoother without the molding bumps. The control surfaces are smaller than those of the Sukhoi, promising a easier-to-fly model. It is also much cleaner and should be faster.

It probably falls between the Sukhoi and P-51 in ease of flying. The *Pole Cat* has long stroke servos and a black back motor like the Sukhoi XP. With 51 square inches of area and a flying weight of 35.3 grams the wing loading is 3.5 ounces/square foot. The BNF version goes for \$99.

The Sbach 342, on the other hand, has a brushless motor, but differs quite a bit from the *Beast*, E-flite's first brushless ultra micro. For starters, the wing is solid foam, not thin sheet, and the skin is smooth. This makes it much more rugged than the ultra micro *Beast*. This 17-inch span model has a wing area of 64.8 square inches and a flying weight of 54.6 grams, resulting in a wing loading of 4.27 ounces/square foot.

The Sbach 342's AR6400NBL receiver has no onboard servos, whereas the *Beast's* AR6400LBL has two integrated linear long throw servos (elevator and rudder). The Sbach 342 has an EFLUM180BL2 BL180 2500 K_v brushless outrunner motor; while the *Beast* has an EFLUM180BL BL180 2300 K_v brushless outrunner motor. That may not sound like much of a difference, but it implies that the Sbach 342's receiver's built-in brushless ESC has a higher current rating than the 3.0-amp continuous current, 3.5-amp peak of the *Beast's* ESC since both use the same 5-2.7 prop.

The specs for this receiver give the weight at 7.8 grams which is the same as given for the AR6400LBL with two servos. I don't believe this weight, but have not pulled it to



PHOTOGRAPHY: STEW MEYERS

E-flite's new 8.5mm brushed motor Cassutt Formula 1 racer can be purchased for around \$99.00.

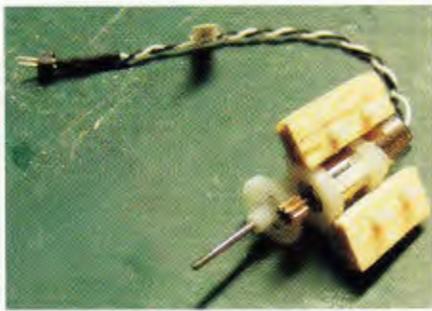
weigh it myself. It uses the same 12.4-gram 180 mAh two-cell battery as the *Beast*. I was happy to see there were three leads going to the power connector of this two-cell battery which implied node connections. Sure enough, a two-cell balancing charger is included in the \$170 BNF package which operates on 12 volts. The AR6400NBL receiver alone is \$60. I'll have to get one for my ducted fan experiments. You really want to use a DX6i, Dx7, DX8 or JR DSM2 compatible transmitter with either of these models so

you can set the throws and incorporate exponential.

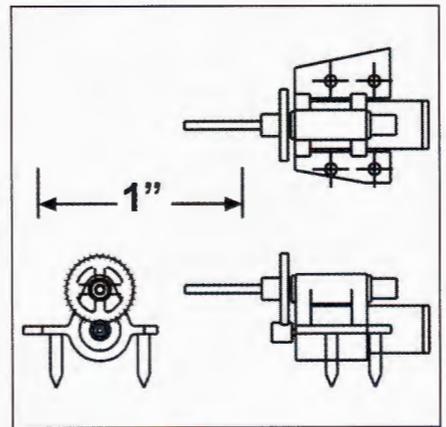
I did get around to building my BMJR *Mini-Dakota* using the PKZ J-3 *Cub* motor for power. I thought I would share the mounting system with you. I made a couple of mount blocks from 1/8-inch balsa and glued these on the motor's mount spikes. I then cut the spikes off flush with the bottom of the blocks. The motor is mounted in the model by gluing the mount block to a shelf with Ambroid. I used Dan Kane's thrust off-



E-flite's new Sbach 342 has a brushless outrunner motor and a two-cell Li-Po battery (at left). Note the servos are not on the receiver. The battery hatch is held on by magnets. Close up of the PKZ J-3 *Cub* motor in Stew's *Mini-Dakota* (above). Note the tube of Ambroid, vital if you need to be able to release a bond



1/8-inch balsa mounts glued to a PKZ J-3 *Cub* motor (above left). The mount spikes will be cut off flush. 7.5-gram servo DT timer (above center), the microprocessor is mounted on the servo. The simple controls consist only of a push button and a LED. PKZ J-3 motor three-view (at right). Stew will gladly send anyone a DXF or a TIF file to incorporate into their plans.



sets to start with, but discovered I needed more when I flew it.

I used the built-in ESC in one of David Theunissen's RX43 receivers in lieu of a timer for test flights and was very happy to be able to control the power while I found the right thrust settings. Using Ambroid to mount the motor allowed me to dissolve the bond with acetone, add shims and re-glue the motor mounts. I ended up with about 5 degrees of down and right thrust offset. The receiver was then replaced with a Pico timer. The all-up weight came out to be 25 grams. The only down side is it flies too well, I keep the motor run down to about ten seconds and then kinda wished it had a DT.

For several years now, I have been playing around with the PICAXE-08M microcontroller. This is a standard Microchip PIC12F683 microcontroller that has been pre-programmed with the PICAXE bootstrap code which enables the PICAXE microcontroller to be re-programmed directly via a simple serial connection. I have programmed the PIC as a timer to drive a standard R/C servo. I wanted to make it dead simple. The control consists of a single push-button with an LED to indicate status. The PIC12F683 is an eight-pin through mount device and quite heavy compared to surface mount microcontrollers. I built a prototype unit to Don Srull's specifications to use a standard PKZ 130 mAh battery. It's tempting to use one of the small 1.5 gram linear servos, but a DT release is much simpler if the line is simply looped over the arm of a rotary servo.

HobbyKing and others have 2.5 gram rotary servos. I have found these will reliably release a one-ounce lead sinker when powered by a 50 mAh Li-Po, making them plenty powerful enough for the job. The proto-

type unit for Don's Lanzo *Classic Wakefield* weighs 7.5 grams and replaces a 5-gram Tomy timer. This is a bit heavy due to the larger battery and standard 1/2 watt resistors rather than surface mount components, but insignificant on the 8-ounce Lanzo. The time is easily programmable from one second up to ten minutes and unlike viscous and mechanical timers, the time is accurate to a fraction of a second and repeatable.

Operation of the timer is as simple as I could make it. When the battery is plugged in, the LED will double flash to indicate the STANDBY state. During this STANDBY state, if the button is pressed and held down on the timer, the LED will flash fast to indicate the ARMED state and will start the TIMING SEQUENCE, indicated by a slow flash, upon release of the button. At the end of the set time, the servo rotates 90 degrees to release the DT line.

The TIMING SEQUENCE can be aborted by pressing the button again and releasing it within a second. The TIME SET function is initiated when the button is pressed and held down for more than a second during the TIMING SEQUENCE. This is indicated by the LED staying on for about a second followed by a one per second flash.

Continue to hold the button down until the desired time is set. You can count the flashes or better yet use a stop watch. Start the watch after the LED starts flashing. Upon release of the button the timer goes back to the STANDBY state with the new time stored.

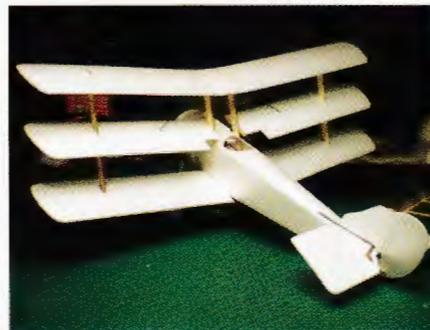
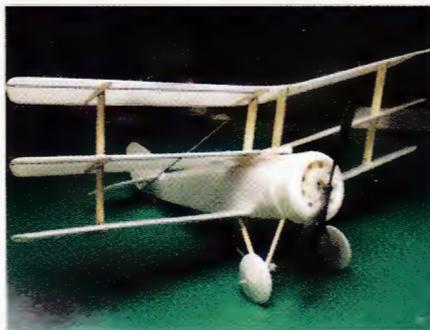
Jinwoo Choe (jinwoochoe@hotmail.com) flew his new Sopwith *Triplane* outside before our last Maxecuter Club meeting. This is the third or fourth version he has built. It now uses a PKZ *Vapor* receiver and a P-51 motor. Jin has a new laser cutter and is making a

\$43 kit for the *Tripe*. Go to the thread on R/C groups to download the exquisite construction manual: <http://www.rcgroups.com/forums/showthread.php?t=1443474>. The model is made mainly from Depron® with a few balsa and carbon rod parts. Jin designed it with a 3D CAD program and it's a work of art. The instructions take you through the build sequence in great detail.

While these pictures are of the unpainted prototype, there are some beautiful photos of color schemes on the R/C groups discussion thread, and Jin has provided decal PDFs for three insignia sets. The only thing the construction manual does not have is instructions on painting. You can pick up hints from the various posts. Pete Schumann, aka mtflyr, is a real artist and knows what he is doing.

The color scheme really needs to be applied to the flat sheet before assembly. The insignia areas should be masked. A light spray dusting of Poly-S is probably the way to go. The all-up weight of a painted *Tripe* with a 150 mAh battery is about 31 grams. Most *Tripes* have been built as three-channel models with RME (Rudder, Motor, Elevator) controls and they fly quite nicely in this configuration, but a few are rumored to have been built with ailerons. This *Tripe* is just the thing to do battle with Fly Zone's Fokker Dr.1 or Albatross.

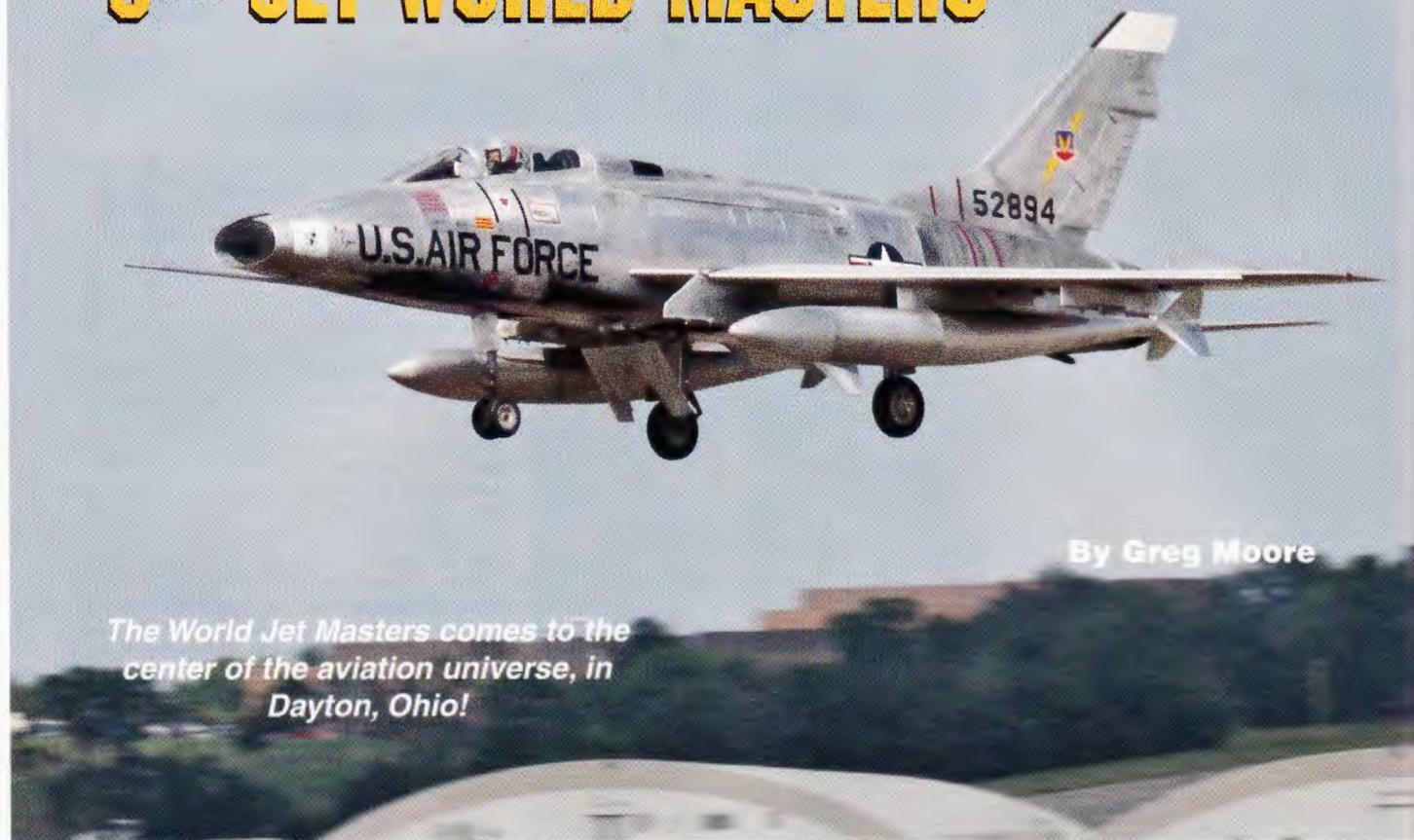
Just a word about David Theunissen's micro DSM2 compatible receivers. He has re-programmed them to make binding easier; the initial one's I received took several attempts. Bob Selman (www.bsdmicrorc.com) is now carrying them and has a version of the RX43 Actuator Rx with connectors to fit Plantraco actuators and PKZ motors and a power plug to mate with a PKZ battery. This unit weighs all of 0.8 grams.



Jinwoo Choe's Sopwith *Triplane* (above left and center) uses a PKZ *Vapor* receiver and P-51 motor. This bare 13-inch span *Tripe* weighs 28 grams ready to fly. Painting will bring the weight up to 31 grams. Jin sells a kit for this model

for \$43 post paid. Pete Schumann's "Black Death" #10 *Tripe* of the Royal Naval Air Service, Black Flight Squadron, and Paul Stamison's N500 prototype are ready for Dawn Patrol on the Front (above right).

9TH JET WORLD MASTERS



By Greg Moore

The World Jet Masters comes to the center of the aviation universe, in Dayton, Ohio!

PHOTOGRAPHY: GREG MOORE & BOB BOSWELL

This edition of the biennial “Olympics” of scale-jet modeling has come to a close after two incredible weeks at The Museum of The US Air Force in Dayton, Ohio. It was, I thought, the perfect place to showcase a worldwide event like this, given the “center of the aviation-universe” that Dayton was at the dawn of flight.

Today’s Wright-Patterson AFB began as Wright Field and Patterson Field; they were merged together in 1947 with the birth of the US Air Force. When the Wright brothers returned from Kitty Hawk, they needed a place to practice and start their flying school, and a dairy farmer named Huffman allowed them use of his field.

Due to periodic flooding, the “Huffman Prairie” was never developed, and today occupies a pristine site just off the end of the active runways on the Patterson side of W-P

AFB. This site is the largest natural prairie in Ohio, a favorite spot for birdwatchers, and a popular destination for aviation tourists. This year, the Wrights would have scratched their heads in wonder at the models brought for competition to a site just over the hill from where they mastered turning and landing.

This event was almost seven years in the making, with Roger Shipley proposing the U.S. as host, only to be rejected for two events within, or close to, Europe. Unfortunately both of the last two events were plagued with problems and financial woes, which really put the heat on Roger and the U.S. organizing committee to have a successful event. The dollars and cents and thousands of hours of work to put on an event of this caliber are staggering, and if not for the tireless Dewey Davenport working with the super-human museum staff,

this event could have been a lost cause.

David Thomas, from the museum, can only be described as an organizational genius (he does 40–50 events each year) with a firm grasp of the time-lines and costs of various items.

Not only did he have flowcharts of everything needed and their timelines, he then worked 21 straight days in the heat and humidity for 14–18 hours each day. Can you say “hero”? Not only did the museum staff provide the scale judging tables, but also thousands of dollars in hard assets (walky-talkies, golf carts, generators and two travel trailers as headquarters) but also countless hours of manpower and support ... all so that 40-50 volunteers could come from all over the US to spend their vacation and an average of \$140 per night in lodging to stage an event.

The International Jet Model Committee requires several large tents for the event to



The entry to the museum (at left). Totally private in funding, though on USAF property. The F-16 “borrowed” by Mark Savage taxis back to the pits (above) after another successfully scored flight.



John Wiebe, (of MAP Products) represented Canada with his F-100 (facing page). Though judges saw detail deficiencies, Greg thought that it was one of the most realistic looking *Huns* that he had seen. Not over, not under done. This shot with the hangars in the background just begs asking: 1960 or 2011? The dedicated "full-time" staff (above left) (from L-R): Jerry Crow, Lance Campbell, Roger Shipley, Bill White, Jim Allen, Andy Andrews, Jacy Andrews, Jonnie



Andrews, Dewey Davenport, Lewis Patton, Joe Dirr, Dave Brawley, David Thomas, and (not shown) Theresa Montgomery. The US team (above right) (from L-R): Bob Bush, David Shulman, Scott Harris, Rod Snyder, Jason Bauer, Kim Foster. One of the neat things at this event was Barry Hou (Kingtech Engines USA) who represented Taiwan (below left), flying his Grumman P-59 while the full-scale version (below right) was only a mile away across the runway.



protect people and their equipment. Accordingly, a 200 x 100-foot competitors' tent, an 80 x 40-foot storage tent and an 80 x 40-foot air-conditioned judging/meeting/relaxation tent were erected. This year, the organizers decided to use breaks and other downtime, as well as at the end of the competition day for open flying, free to whoever desired, so a 120 x 30-foot tent was erected to protect those folks from the weather as well. Add in the two trailers, the vendors' tent-row, throw in the folks who came in their RVs and trailers and all of the sudden we have the makings of a small city.

Unfortunately, tents are not designed to withstand a microburst right on top of them. On Sunday, July 24th, the teams were arriving and unpacking when a strong thunderstorm rolled in. The resultant microburst destroyed the 200 x 100-foot tent, throwing

it complete with poles, braces and spikes 1000-1500 feet downwind, going over three lines of cars.

Fortunately for the four people injured, none of the injuries were life threatening. Stepping up to the challenge, the staff had a three-hour planning session and began that evening on an item list to have things up and running on time for the event to start as scheduled. What had taken days to set up originally, the tent company made happen in less than 24 hours, working through the night and checking, double and triple checking everything to ensure that indeed, the event started exactly on time.

Several models were broken badly, with the South African team taking the brunt of the damage. Mark Savage had brought his Glen Roberts designed DeHavilland *Vampire*, which was unfortunately, folded up

into four pieces and companion Francois' *Hawk* looked like a deflated beach ball. Italian Sebastiano Silvestri (Seba of Sebart) had the entire vertical fin on his F-16 ripped off and Dylan Roberts (son of Glen and co-designer) had every moving surface and tip on his *Vampire* damaged. Dylan was able to repair his model and compete, and Seba built an entire new fin, finished it, painted it and weathered it to match his documentation ... at the field.

Now it is time for the human-interest portion of this report. Apparently, whenever a South African participates in an international event, representing their country, not only is it a great honor for the individual, but also for their country. The individual is then rewarded by "earning their national colors", and this is shown by the different nomenclatures on their shirts.



The Hungarian JAS-39. Reports are it is beautiful and would have done well in *static* (above left). There were three father/son teams present, and Greg thinks



that Italian Frederico Rosina was the youngest, aiding and being aided by his dad, Alesandro (above right), with both of them flying similar L-39s.

2011 Jet Masters



In flight, the *Vampire* has such a smooth presence, with the word "graceful" coming to mind (**above left**). With the model's light wing loading, this model of Dylan and Glen Roberts can be fun getting it to stop flying right at the center marker, being a bit of a "floaters" (**above right**). Glen Roberts, son Dylan, posing



with their *Vampire*, (**below**) and mom (at home) spent better than six years designing, molding and finalizing their wonderful *Vampires*. Mom was put to work cutting glass, and fabricating the straps, flight suits and so forth. Having seen a full-scale in England, this is one of only a few that Greg couldn't wait to see.



The problem with the damage was that three of the four jets (and their pilots) were out of commission, so not only was it a tremendous financial hit, but also an honor thing. Their country's rules state that all they have to do is participate in both portions of the event (static and flying) to come home with the honor of representing their country. Enter the US staffers and team

Dave Brawley and others managed to get pieces and parts together to enable Dylan Roberts to repair his plane, and Scott Harris sold his backup plane, a Skymaster F-16 (featured on the cover of the August issue of *Model Aviation*) to Mark Savage for \$1.25, then bought it back at the end of the competition for \$1.00 so that Mark could participate. The efforts of only a few enabled the South African team to bring great honor to



One of the other airplanes that Greg has followed for several years is the T-45 *Goshawk* (**above**) of England's sole representative, Paul Dunkley. Paul is a retired RAF pilot who flew *Tornados* and taught in *Hawks* so he truly understands the flight envelope of the airframe. Better than six years were spent in "his garden shed" designing, molding and building the plane, and it is just spectacular! Greg has been up close and personal to several T-45s, and it is hard to find fault (though the judges did) with Paul's rendition. One of the most prominent features on the T-45 is its landing gear, with large ranges of travel to survive both the carrier environment, and the less than subtle skills of student pilots. Paul has replicated the travel of the gear (especially the nose gear) nicely. The main gear units are beautiful (**at right, top**), though one can say they don't look a whole lot different from some of the commercial units, but the nose gear (**at right, bottom**) is a whole different animal, especially given its throw.





Bob Bush, of the US team, brings his F-100, in *Thunderbirds* colors (above), in at center stage, right in front of the Museum. Greg suspects it wanted to say hello to its full-size predecessor in the museum display. Alex Lau (from China-Hong Kong) brought his *Thunderbirds* F-16 (at right) in for a visit to the original *Thunderbird* F-16A is now billeted inside the museum.



themselves, and their country.

Hungary had only a single entry this year, and with life being life, the model (a JAS-39) was shipped directly from the builder to Dayton, unflown. The pilot and team were reluctant to test fly it at the museum and were going to withdraw, but permission was obtained to use the TORKS field in Columbus, OH. Andy Andrews loaned them, and

Joe Dirr his truck and off to Columbus they went. Even though the c.g. and throws could not be adequately set for competition flying and the team withdrew, every effort was made to get them in the air.

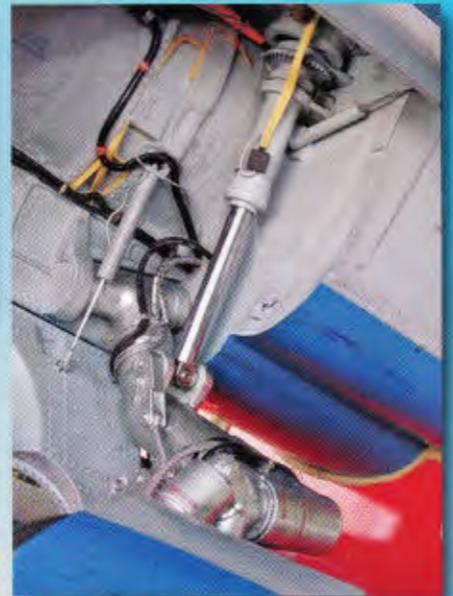
Okay, I can hear you saying: "We now know the background story, how about the competition?" The event was divided into two weight classes—13.5 kilograms and 20

kilograms (29.7 pounds and 42 pounds)—weighed empty. Of the 48 pilots who flew, 34 were in the heavy class.

This is a scale event, so static judging is one-half your total score, and of the three flying rounds only two are kept (and averaged) for the remaining half of the score. The static judges are allowed to get as close as they like in judging (amazing the things



Greg didn't know the guys from Russjet, and their two MiG-27 swing-wing fighter-bombers. Oleg Zahkarov and Boris Satovskiy brought matching planes that were unbelievable, and yet suffered the fate of many, due to the critical eyes of the scale judges. At a 1:5.5 scale, they were 3.1 meters long with a wing span of 2520 mm extended and only 1410 mm swept. Seeing both sitting next to each other with the wings at their extremes really gives one pause, thinking of the design and engineering needed. Both flew routines with the wings in all three positions (above left and center), but Oleg told Greg that the full sweep is very twitchy. The landing gear was/is a thing of beauty, being handmade from TiG welded titanium using hydraulics for shock absorption as well as the disc brakes. Activation of the complex geometry of the landing gear, as well as the jackscrew driving the wing sweep is by a Maxon electric motor. In the first picture (at right, above), you can see the jackscrew's teeth in the upper right, and in the next two (below, left and center) you can visualize the complex tucking and folding action that the main gear requires.



2011 Jet Masters



Events of this caliber obviously bring out the best, and the Thai team is no exception. Having a large soft spot for the *Alpha Jet*, Greg was pleasantly surprised to find four of them lined up as on a flight line (above). This is a wonderful flying airplane, hampered in static scale by its complex landing gear (at right, above) and need for a very short bifurcated exhaust pipe. The Thais accomplished the landing gear via a 5-axis CNC machine, and while not "scale" in appearance, in two years time he can only imagine how true to scale they will be! Not only did they do some engineering, they paid attention to the small details like the "Break glass in case of emergency" (at right) emergency exit handle, making it three-dimensional, not just a decal.



One of the most awaited planes was the *Magister* from Phil Avonds. Several years in the "perfection" stage, it will be another winning everyday flier, and not surprisingly, Phil won the 13.5 Kg class.

they find and downgrade, but share willingly with anyone), and though they have a timed session for examination, they are picky! Not only is the building and finishing of the model important, so is the documentation, with more than a few competitors suffering lowered marks because of it. The flying judges are not allowed to discuss their scores with each other, and are very demanding in their judging.

Rather than a blow-by-blow of the competitors, I will provide a number of photos with captions trying to give you a feel of what happened during those two weeks in Dayton.

Hopefully, I have been able to convey some of the outstanding modeling shown at the JWM. It was two weeks of magic, in an historic location. If you'd like to see these jets in action, be sure to check out the latest offering from SKS Video Productions (see page 8 for more information).



Chock full of detail, the large Fiat G-91 of Italian Gianluca De Marchia (above) flew like a large trainer, so light was its wing loading (which fit the flight profile the judges like to see). Each time you looked at the plane you saw more. Since the full scale used a drogue chute Gianluca's does as well. In the nose view (at left, top), the pilot's kit bag and the stain from the gunpowder residue are noted, while the rivets, chipped paint and other niceties are noticed in the rear view (at left).



Probably the most anticipated airplane at the event was Vitaly Robertus' Yak 130 (above). This project was four years in the making and documented with several YouTube videos. In essence, they drove a full-scale airplane into the hangar, put the wash cycle on hot, put the dry cycle on hot and forgot to take the airplane out, so it shrank. The airplane uses two 90N engines, has all molded everything and has raised the scale bar to spectacular heights. For average mortals to achieve what Vitaly (and thousands of hours of labor on his part) has done without some major help from companies like Yak is probably not possible but still... wow, what a model! While taxiing out, Vitaly had "Russian ground control" talking over the PA and telling him the wind; just another touch of realism. You'll note that the intakes are closed at takeoff. Like all Russian fighters and trainers, the main intakes close and auxiliary intakes open above (at right, top). When in flight, the intake covers open and the auxiliaries on the upper skin of the fuselage, close. You can see some of the surface detail and the realistically operating top beacon (at right). The most talked about part of this airplane are the three working Multi Function Displays (below). The series of pictures show how they each cycle through a menu of images, and add tremendous amounts of realism.



A whole article could be written on the fantastic landing gear (at left), which was fabricated from carbon fiber under high pressure, since it is stronger and lighter than aluminum. Bottom view (below) in a dirty roll.

C/L *Stunt* by allen brickhaus

You can reach **Allen Brickhaus** at PO Box 206, Golconda, Illinois 62938, or via e-mail at abkb801@shawneelink.net

While Allen is taking care of some business, Dennis Adamisin agreed to help out and take over for a few months. Since e-power is coming of age in Stunt aircraft, Dennis, thanks to his own heavy involvement, will outline what it takes to power e-Stunters and understand the process. —Ed.

I have had people come up to me and say, “I don’t understand electric.” I have also had people come up after I fly and say “If I had a power system like that I would fly all electric.” Funny thing is both statements often come from the same person. It speaks to the core issue right now for electric flight—that there are a lot of people who would give it a go if only they felt more comfortable with it. Allen asked me to write some basics about electric power systems for control line from the perspective of the potential “newbie”. If you are one of those curious bystanders hopefully we can put you in the frame of mind for success.

It is really no different than it was when you built your gas first model. For example, say you picked up a profile kit. You read the box and it said “for .19-35 engines—huh? So you dug a little deeper, probably got some help and then settled on a 29—terrific! A prop? Well I like the looks of that 14-incher over there—what do you mean that’s too big? Now it’s time for a fuel tank—1-ounce? 4-ounce? 7-ounce? Metal? Plastic? Wedge, round, or square? Okay I got it all put together, time to get some fuel—what brand? What’s nitro for? If it adds power shouldn’t I get the highest nitro I can find? Lessee, someone said I should “break-in” the engine—How? Where do I buy a 1.5V starting battery? And just what does that needle valve thingy do anyway?

Maybe the above is a little dramatic, or is it? The point is that we did not have an in-born knowledge of exactly what we needed to succeed when we started flying IC models. The components all had to be selected



PHOTOGRAPHY: DENNIS ADAMISIN

Line-up of motors for any size of model including- 2810 (25-30) 2815 (35) 2820 (40-45) 2826 (50) 2826 (60).

and we had to learn how to use everything, and now we have a “feel” for what we need for each new set-up. Many of us went on to learn how to run engines with pressurized fuel systems or tuned exhaust systems. If we were lucky we had someone helping us.

Thus it comes as no surprise that people feel that same anguish as they contemplate their first electric powered model. How can I tell what size motor I need and what size battery? What are all those numbers and what do they mean? What is an ESC? Timer? Battery-balancer? What if I break it? Not to worry, if anything it is really easier to set up an electric model than it is setting up a gassie.

Motor: Modern e-C/L systems use what are called brushless “outrunner” motors. The base of the motor and the copper windings are stationary, the outer motor shell, which contains the magnets, rotates around

the windings. This style of motor produces an abundance of torque and will happily run at the rpm we need without using a gearbox. Brushless motors have no electrical contacts that wear. In fact the only “contact” points in an outrunner motor are the ball bearings. They should last a very long time which could probably be extended even longer by servicing the ball bearings. The diameter and length of the motor determines how much iron and copper it can contain, and how much power it can produce. Think of them as the bore and stroke of your outrunner motor!

Battery: The single biggest enabler for model aircraft electric power systems has been the development of lithium polymer (aka “Li-Po”) batteries. These batteries are used in cell phones, lap top computers, cordless power tools and similar devices because they carry a lot of energy in reasonably sized



The right side of a fuselage showing the motor, timer and Li-Po battery installation (above left). The left side of the same plane (above right). Here the



ESC is installed on the left side. This allows the ESC to receive more than adequate cooling throughout the flight.

package. Each Li-Po cell has a nominal voltage of 3.7 volts and we stack the cells together to get the total voltage we need.

Electronic Speed Control: The ESC is the fuel line and filter between the battery and the motor; it converts the DC power from the battery into phased DC power for the motor. The ESC electronically switches the motor on and off to achieve the rpm we are seeking.

Timer: All of the parts discussed so far are basically R/C system components; that is to say they are readily available from whatever source you usually go to get your hobby supplies. The next part is the only truly unique for e-C/L component—the timer. The timer takes the place of the R/C receiver. The timer sets the flight duration (surprise!) but it also sets the speed—it is the “needle valve” of our system. The timer sends a “START” signal to the ESC, then it sends a throttle speed message and eventually it sends the “STOP” signal to shut off the motor.

Chargers and balancers: Nearly as important as the development of Li-Po batteries has been the development of really good and really simple chargers that will charge these batteries to their maximum capacity and balance the individual cells to the same voltage. This assures the maximum performance and longevity of the batteries.

Okay now you have the “30,000 foot view”. How do you choose *which* of the pieces you

need? A couple of years ago I had a conversation like this with John Brodak. John is of course one of the premier suppliers to the C/L community, including one of the only outlets for true C/L engines. What we settled on was a scheme to pre-select parts that would correspond to the IC power equivalent. There have been several attempts to develop “Rules of Thumb” that link IC horsepower to electric wattage, but such linkages prove to be one step removed from a dice roll.

What I settled on was to start with the prop size that was needed, then match the appropriate motor, battery, ESC and timer to it. This, of course, required a sizable investment by John into motors, batteries and test airplanes as well as quite a bit of work on my part to actually build everything and test it. I’ll cut to the chase: Brodak now offers a full range of power systems cross referenced to IC engine sizes.

The easiest way to use the chart is to consider what prop size you want to use then look at the components around it. For example, for a “25” engine I would expect to use a 9-inch diameter prop. Find the Prop Size column and trace it down to the 9-inch prop size and behold; the EPS-25 system components! You can also use it to consider a power-up.

For example, say you are building a “Classic” Stunter that flew with a Fox 35 and a 10-6 prop. Many folks like to add a

little more power to the Classics. An 11-inch prop in place of the old 10-inch prop represents a 21% increase in prop disc area and that potential for a huge thrust increase. Follow the chart down to the 11-inch props, pick up the phone and tell the good people at Brodak just what components you need.

A slight word of caution though: as you pick more powerful systems, the motor and batteries get heavier—no surprise there. Thus it makes sense to not go more than one (maybe two) sizes beyond.

There is an old saying that, “Pioneers are the ones who get the arrows in their head.” Well, luckily for the newcomer to electric flight, most of the volleys of arrows have been endured. We can benefit from their lessons learned. The single best source I am aware of for electric control line is the Stunt Hangar forum, in the folder called “Getting All Amped Up”, there is a thread called “List Your Set-up”—and for the past few years people from around the world have been doing just that.

Almost no matter what you want to build, somebody somewhere has either already electrified one, or has one similar to it. We are at the stage where almost anything you want to try already has a precedent—the pioneer times are behind us, we can confidently purchase a shopping list of items and know that they will work—if only we give them the chance!

BRODAK POWER SYSTEMS AND COMPONENTS

(For more information go to the Brodak website at www.brodak.com)

Name	Target Glow Size	Motor	ESC	Timer	Li-Po	Good Prop	Recommended Charger	Application
EPS-020	.020-.049	1806	Arrowind 12A	FM-0e	2S x 450	6x4	Mini or GT-M4	Swordsman 18
EPS-050	.049-.075	2205	Arrowind 12A	FM-0e	2S x 850	6x5.5	Mini or GT-M4	Baby Clown, any Reed Valve app
EPS-10	.10 - .15	2210	Arrowind 18A	FM-0c	3Sx1300	7x5	GT-M4 or GT-A6	Sport 09-15, Pathfinder, Akromaster
EPS 25	.19-.25	2810	Arrowind 35A	FM-0c	4S x 2200	9x4.5	GT-M4 or GT-A6	Ringmaster class models
EPS-SC	.25-.35	2815-SC	Arrowind 35A	FM-0c	3S x 3300	9x4.5-10x5	GT-M4 or GT-A6	Special motor for the Super Clown ARF
EPS 35 Sport	.30-.40	2815-Std	Arrowind 40A	FM-0c	4S x 2200	10x5	GT-M4 or GT-A6	Most Classic Stunters.
EPS 35 PRO	.30-.40	2815-St	ICE 50	FM-2SR	4S x 2200	11x5.5	GT-M4 or GT-A6	same as above
EPS 40 Sport	.40-.45	2820	Arrowind 40A	FM-0c	4S x 2800	11x5.5	GT-M4 or GT-A6	Proven power-up versus a 46
EPS 40 PRO	.40-.45	2820	ICE 50	FM-2SR	4S x 3300	12x4.5	GT-M4 or GT-A6	same as above
EPS 45 Sport	.45-.50	2826	Arrowind 40A	FM-0c	4S x 3300	12x6	GT-M4 or GT-A6	Most popular size motor in use today.
EPS 45 PRO	.45-.50	2826	ICE 50	FM-2SR	4S x 3300	12x6	GT-M4 or GT-A6	same as above
EPS 50 Sport	.55-.60	2832	Arrowind 40A	FM-0c	4S x 3300	13x4.5	GT-M4 or GT-A6	same as above
EPS 50 PRO	.55-.60	2832	ICE 50	FM-2SR	4S x 3300	13x4.5	GT-M4 or GT-A6	6mm more power, to deal with the weight of your 20-point finish
EPS 60 PRO	.60-.65	3526	ICE 50	FM-2SR	6S x 2200	13x5.5-13x6.5	GT-A6	BIG power in lighter package
EPS 65 Sport	.60-.65	3526	Arrowind 60A	FM-0c	6S x 2800	13x5.5-14x7	GT-A6	Big scale model
EPS 65 PRO	.65-.75	3526	ICE 50	FM-2SR	6S x 2800	13x4.5-14x7	GT-A6	Most powerful ECL system

ElectriFly

F-20 Tigershark



By Greg Moore

It's a short time from box to field with this foam EDF, complete with HyperFlow fan.

PHOTO: BOO HART

Begun in 1975 as a further development of the twin engine F-5 *Tiger II* light fighter jet, Northrop's F-20 *Tigershark* remains as the last privately funded fighter and, arguably, the best fighter never produced. The project was initiated under the FX program for a light-weight export oriented fighter to supply US allies. Northrop found that switching from two engines to a single engine configuration resulted in a significant (approximately 60%) boost in performance, with every contemporary finishing second in mock combat.

First flown in 1982, and cancelled in 1986 after only three aircraft were produced, the F-20 was a victim of changing political positions, and the belief of overseas customers that only the aircraft flown by the US military were worth looking at for purchase. Fortunately, the wonderful flight characteristics reported by test pilots (including Chuck Yeager) have made their way into miniaturized form in ElectriFly's version.

The "kit"

When the big brown box shows up on your doorstep, you will know that Great Planes has taken care in packaging this 37-inch long AeroCell foam ARF since the inner box is securely packaged inside of a heavy-duty 40 x 12 x 14-inch outer box. In spite of all that the package handlers could do to it going from Champaign, IL to Newton, NJ and

then to Colorado, every part looked like it did when it was placed in the box following manufacture ... which made me very happy!

Included in the outer box for this review were a Futaba 6017 receiver (a 2.4 GHz spread spectrum type) and an ElectriFly 2200mAh 4S 25C Li-Po battery. The only thing needed to add to what was in the box was a little denatured alcohol and some Bob Smith (*see ad on page 9*) medium CyA (my preferred brand).

Since this is a receiver ready version, it is in many respects almost a "ready to fly" model as opposed to an "almost ready to fly", since so much work has been done at the factory. All three servos are installed, with the control arms correctly positioned, holes drilled and screws tightened; as well as the control arms with quick connects attached to the control surfaces. The "Y" connector is already installed for the aileron servos, as is the extension for the elevator servo. The Hyperflow 54 mm fan unit is pre-installed with an Ammo 24-45; 3790 K_v brushless motor and an ElectriFly Silver-Series 45-amp speed control wired into place with the wires set for the correct rotation.

The "kit" (I still seem to refer to all models as kits) is securely packaged in two layers in the inner box (with very nice "box-art"). The parts are all bagged and taped securely to the upper level so that they cannot shift in transit, and the fuselage is se-

curely "stuck" in the middle of the lower level with custom cutouts in 3-inch thick pieces of Styrofoam®. These parts "ain't going nowhere"! Available in two versions (ARF and receiver ready) the packaging will be the same, only the parts in the outer box will be different.

Assembling the parts

Okay, the formalities of what-is-what are over, let's put it together! I assembled the review model in two evenings, which when time for photos, photos and more photos is removed means that the receiver ready version can be started after dinner on Friday night and ready to go to the field early Saturday morning ... with a good night's sleep thrown in to boot.

The first thing I noticed when removing parts from their packaging was the more "robust" feel of the AeroCell EP-foam and the nicely light paint job. The second thing I noted was the very nicely done cockpit, which is a very nice touch! The manual contains an addendum sheet listing all the steps that have been done for you and the page in the instruction manual that it refers to. You will also notice that when you trial fit the four assemblies that need to be glued (yup, that's it, only four!) they all fit perfectly, not requiring any adjustment at all!

The first glue job is a wing (so is the second). This is a good time to be cautious and



PHOTOGRAPHY: GREG MOORE

The upper shelf secures the few parts of the airplane in plastic bags securely taped in place (above), with the instruction manual, addendums and instructions on the Hyperflow fan also taped in place. The bottom portion of the box contains the fuselage, AIM 9 missiles and a foam display stand, all securely taped or inserted into foam blocks (below).



AT A GLANCE

Type:	R/C electric sport scale
Construction:	AeroCell foam
Wing span:	22.5 inches
Wing area:	162 sq. in.
Airfoil:	flat bottom
Length:	37 inches
Weight:	31 ounces
Wing loading:	24.5 oz./sq.ft.
Motor:	Ammo 24-45 with a 3790 K _v
Ducted Fan:	HyperFlow
ESC:	45-amp
Battery:	2200mAh 25C Li-Po
Radio:	4-channel, 4 mini servos)
Manufacturer:	ElectriFly
	Dist. by: Hobbico
	P.O. Box 9021
	Champaign, IL 61826
	217-398-3630
	www.electrifly.com

check the servo screws in the servos, rather than after the wings are attached. While doing this you will notice the paint along the fuselage has been perfectly masked to the shape of the wing root, so there is no need to guess at the orientation.

Fitting the carbon fiber spar takes only a few minutes; just be sure to measure reasonably closely for aligning the center of the spar and the center of the fuselage.

When gluing the wings, I prefer *not* to use kicker, since I make a number of small dim-

ples in both surfaces to create small mushrooms with the CyA, so I want it to flow and set more slowly (several minutes rather than several seconds). Even so, the wings are at most a 15-20 minute project. Likewise, the stab is only a few minutes to align and glue ... then the interminable wait (of five minutes or so) for the glue to set.

The final glue job is the fin, which attaches to the removable fan hatch/top of the thrust tube/top of the fuselage. It attaches at the front with two strong magnets, and at the rear with a plastic slip-on tail cone, which is held in place with a small piece of tape on the bottom. Simple, light and functional!

Finally, install the pre-bent pushrods and receiver, set the throws, install some hook-and-loop fasteners and place the battery for the correct c.g. balance and it is time for bed. No, you can actually read this faster than you can finish the receiver-ready version of the ARF, but combined with reading the manual, the timing is close. So, yes, I am impressed with the degree of pre-assembly and attention to detail in this model!

Flying

Finally, the reason for assembling this model! The manual describes two ways for launching her. The first is demonstrated on the ElectriFly website: (www.electrifly.com/ductedfans/gpma1875.html) which is an underhanded throw. For the 99.5% of you who live in thicker air below 2000 feet (or so) in elevation, it should be an easy way to get her airborne. Up here at 7000 feet, an overhand toss (supporting the wing to avoid a spiral throw) works best. In short, you are better with a helper on this airplane, since coordinated throttle, aileron and elevator are needed from the get-go, until you are very

comfortable with the sink rate after launch. That being said, even on the first flight when it was *grossly* out of trim in roll and pitch, as long as I kept flying the airplane all was fine, and when trimmed out she just grooved!

The power that the Hyperflow unit puts out is surprising. It is almost enough to launch vertically, and once on step, I rarely flew above half-throttle, using full only for monstrous climbs. Beware though! She does get *very* small *very* quickly, but big loops are so effortless that you will want to pretend you are in a pattern contest doing the three-loops maneuver!

How tough is the AeroCell foam you ask. Well I hate to admit that I had to find out the hard way. The wind was 90 degrees across the runway, so I launched into it and got things trimmed out while Rod Hart took photos of the bouncing bronc. Just as I was beginning to get comfortable (and think about how much expo was needed in the throws) it was time to land.

Knowing that the pilot barrier fence and pilot stations were at least 40 feet in front of me, I brought the plane down 20 feet in front of me, right into the fence! All six people standing next to me said "ouch". I said a few other things, but fortunately Rod caught the picture.

Five minutes later after I had quit jumping up and down, I borrowed (stole?) some 5-minute epoxy and medium CyA to put the nose and ply plate back on where they had separated along a part-line. By the time the battery had charged (1500 mA out of a 2200 mAh battery pack for a 5-minute flight) all the glue was well set, and I put her up again. I don't advise trying to run her through a catch fence, but ElectriFly did well in choosing the right material for this job!

F-20 Tigershark



The wings are nicely molded with a spar slot in the bottom that matches perfectly with the one in the fuselage, and pre-installed control horns with quick release attachments. The wings in place (above left), about 10 minutes from starting, waiting for the piece of foam spar slot filler to be CyA'd into place. The only step that required weight as a clamp, was gluing the stab/elevator assembly to the bottom of the fuselage (above right). Old ankle-weights from a garage sale work well here. The top-half of the fuselage (below left) which supports the fin and the top of the molded exhaust duct is above. It is secured



to the rest of the fuselage with two strong magnets in front, two locating flanges on each side and a ring in the rear. The Hyperflow fan/motor assembly nestles securely in its molded recess and is held with several drops of glue, with all the wires threaded through a molded recess over the fan. Should you elect to use a 72 MHz radio system, a tube also goes through here for your antenna to be placed exiting at the base of the fin. The elevator pushrod (below right) has been reinforced with a tube over the pushrod to decrease flex in this all-important control, and does indeed, provide a secure "feel".



The only modifications I have done are to place three layers of clear packing tape over the servo covers/landing blocks and where the nose of the fuselage touches. I did land in the grass on the second flight, but given the straw we have with our drought, the number of prickly-pear cacti that have spread, and puncture AeroCell foam easily, and the quantity of little rocks rattling around inside, I'd rather replace some tape and land on the asphalt.

I am contemplating several cooling holes

in the nose, since even though the battery has remained barely above the 90-degree ambient temperature, the speed control gets hot, as in hot enough to melt the glue from the hook-and-loop fasteners. I have yet to have a thermal cut-off, and I don't want one!

Motor and fan combination

The Hyperflow 54mm fan unit, when combined with the Ammo 24-45; 3790 K_v, is a combination that just works! The published data states 29 ounces of thrust which I be-

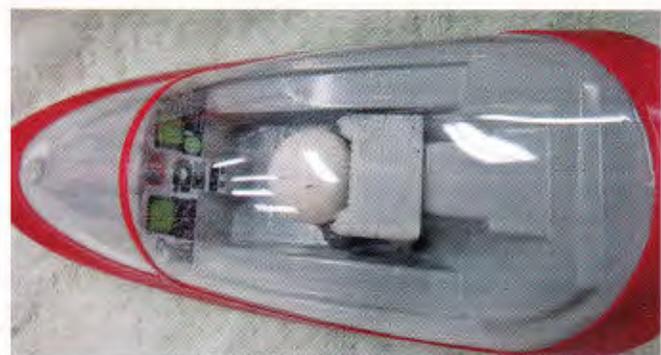
lieve, given the static thrust on my 31-ounce model, is very close to 1:1. At 48,000 rpm, it was nice having the balancing and setting done at the factory in this receiver ready kit, and with an exhaust velocity of 165 mph it surely likes to go! The fan/motor/battery combination is just about perfect temperature wise, and should give a long lifespan.

Futaba 6017 FASST receiver

This receiver is one of a number of receivers operating in the "7-channel" mode of



The ElectriFly Silver Series 4S-capable 45-amp speed control (above left) is already wired and placed in the front of the fuselage awaiting the final placement



with hook-and-loop fastener. A close-up view of the cockpit (above right) Tremendous detail in a small, light package.



There is not a lot of space inside (at left)! The ESC and receiver are very close to each other, with wires actually touching; but this has been a non-issue with the Futaba FASST system so far. Finished (above)! The nicely done sticky-back decals really set off the F-20, and the nicely done "office" adds to the effect of a "miniature". Likewise, the AIM 9 missiles on the tips are secured with two magnets, with the inner aspect of each containing a molded-in airfoil for the correct side, and correct orientation.

Futaba's FASST system. This part of their "catalog" operates at 1024 bits/second, which is the same resolution as a PCM set-up on FM. The other part of the FASST system is for the 8- and 14-channel receivers, or "multi-system" and operates at 2048 bits/second. I have been flying FASST for three or four years now, and it is very difficult to tell which resolution I am flying, since both are **markedly** more precise than the 512 bits/second resolution of conventional FM that drove most of my airplanes.

How does it link to my transmitter is generally the first question. When powered up for the first time, the "power on" LED glows red (which it does whenever there is not a good signal ... like forgetting to turn on the transmitter). Pressing the small button on the side with a small plastic screwdriver or pencil for two to three seconds causes the light to blink, removal of the pencil then re-

sults in a solid green light. The receiver and transmitter are now bound, and while it is possible to lose "bind", I am unaware of anyone having had that happen.

The next thing to note is that there are two antennae. The silver part at the ends is the active portion, and should not be blocked with a metallic tape. The two antennae should be placed as close to 90 degrees from each other as possible (and when I can, I like them as far apart as possible, though space dictates this). I generally secure the antennae to the sides of the fuselage with regular masking tape, since it holds acceptably, but releases if it needs to.

Conclusions

ElectriFly's combination of Hyperflow fan, Ammo motor, their 45-amp ESC and a 2200 mAh battery in this F-20 *Tigershark* is a nicely balanced power system with all the

parts complementing each other. The receiver ready version provides a balanced and assembled fan unit that is smooth at full throttle, which is about 48,000 rpm, and needs to be perfect to avoid ripping itself apart.

The AeroCell foam is perfect for the task, and stood up to some un-intended abuse. Assembly is straightforward, the parts fit is precise and the instruction manuals are concise. As Siskle and Ebert used to say: "Two thumbs up"!

The one and only downside was the lack of an instruction sheet for the Silver Series ESC. If you have never used an ElectriFly speed control, the safety feature makes you scratch your head as to why the throttle doesn't want to work. Fortunately, the manual can be found on the web at: www.electrifly.com/escs/silverseries.html, then open the PDF file. All-in-all, this plane is a winner. ☺



The bright Northrop demonstrator scheme shows up really well at any angle, allowing the pilot to keep orientation at all times (above). The HyperFlow and Ammo motor combination worked well throughout testing. Even at 7000 feet above sea level, both the motor and Li-Po never reached a dangerous temperature.



Project FOAMY

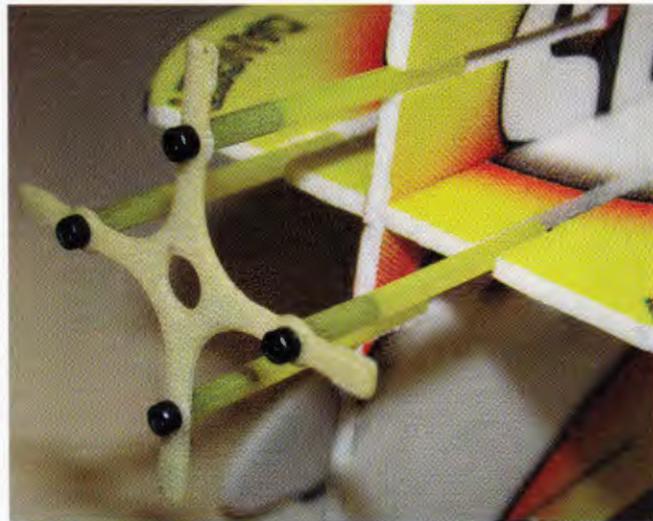
by dave lockhart

You can reach **Dave Lockhart** c/o FLYING MODELS, 108 Phil Hardin Road, Newton, New Jersey 07860 or via e-mail at davel322@comcast.net



PHOTOGRAPHY: DAVE LOCKHART

A common method of reinforcing the motor mount structure is the use of large foam gussets (above), as seen on the *SUltimate* flown by Donatas Pauzuolis at the 2010 ETOC. Adjustable motor mount being installed (at right).



Installing the A10-9L motor can be as simple as bolting the included “X-mount” to the back of the motor, and then gluing the X-mount to the nose of the plane. Strips of Blendederm tape can be added to strengthen the mounting; placing the strips on the front face of the X legs, and then folding them back onto the fuse sides and horizontal crutch. For F3P flying, the tape alone is often enough to secure the motor.

While adjustments to motor thrust are rarely needed on foamies, gluing the X-mount eliminates the ability to make adjustments. With new planes, completing the first couple flights with tape only is an option to ensure thrust angles are correct, prior to gluing the X-mount.

Over time, the nose of foamies tends to develop cracks and “soften” up from motor vibrations, hard landings, catching at the end of flights, and general handling. Large gussets of 3mm foam are often added to increase the rigidity and durability of the nose. My preference is to use 1 × 2-inch wide strips of fiberglass cloth in each corner of the nose, which greatly stiffens the nose, and provides a more durable surface for tape.

For *George*, I chose to dispense with the stock X-mount, and made a similar mount from $\frac{1}{16}$ -inch fiberglass sheet (0.060-inch, or 1.5mm) with slightly wider legs. The wider legs were needed to accommodate 2-56 bolts used to screw the X-mount to “threaded inserts” fitted to the fuselage. The four threaded inserts were made from Sullivan inner Ny-Rod. Each 1.5 inch long piece was thoroughly tapped for 2-56, and then bolted to the X-mount with $\frac{1}{2}$ -inch nylon 2-56 bolts (thoroughly cleaned up with 2-56 die). The X-mount assembly was then slid into place into the pre-cut slots in the fuselage/crutch, with a uniform $\frac{1}{16}$ -inch gap between the X-mount and front of the fuselage/crutch, and glued into place. I then added 2 × 2-inch

squares of fiberglass cloth to each corner, securely locking the threaded inserts into place. The end result is a very strong motor mount that is easily adjustable (with shims between the X-mount and threaded inserts). Additionally, the 2-56 nylon bolts (1 gram lighter than steel bolts) will occasionally break in a crash, preventing more severe damage to the mount and nose of the plane.

In the home stretch now, the last major item to complete on *George* is mounting the Li-Po battery. With the Li-Po sitting on the leading edge of the wing, *George* should balance at 90-95 mm aft of the leading edge. The most common method of Li-Po mounting is adhesive backed hook and loop fastener on the fuselage, and the mating side of hook and loop on the Li-Pos. Once I have the final location of the Li-Po established, I reinforce the area with a piece of fiberglass cloth, which reduces the likelihood of the hook and loop fastener pulling away from the foam fuselage. High quality hook and loop fastener is sufficient to keep the Li-Po attached in the most violent of maneuvers; this is not a place to minimize weight or use old pieces of hook and loop fastener. 1 × 1.5-inch hook and loop pieces for both the fuselage and Li-Po will add approximately 0.5 grams. For *George*, the Li-Po is installed on the left side of the fuselage (to balance the ESC and Rx which are on the right side) above the horizontal crutch (for proper vertical c.g. balance).

Current day, the vast majority of indoor foamies for 3D and F3P flying are using 2S Li-Pos. ThunderPower Li-Pos have long been the benchmark for high performance application. For 3D use, the latest generation G6 ProPower 2S 325 mAh battery is rated for 65C (21-amp) continuous discharge. Weight is approximately 23 grams. Typical 3D setups are running at 8–12 amps peak, and the 325 mAh pack will provide very solid power for three minutes of aggressive flying (freestyle/aeromusical rou-

tines are two minutes in length).

For F3P use, the G6 ProLite 2S 250 mAh is rated for 25C (6.3-amp) continuous discharge. Weight is approximately 17 grams. Typical F3P setups are running between 6 and 8 amps, with competition flights lasting approximately two minutes, using 100–150 mAh. The lower current consumption for the typical F3P flight allows smaller 180 mAh Li-Pos to be used on the lighter planes (<4.5 ounces, or 125 grams) and more efficient setups (Neutrino). 2S 180 mAh Li-Pos are currently available from Hyperion, Dynamite, and E-flite and weigh 12–14 grams depending on plug configurations.

As with all other components, even Li-Pos are not exempt from being put on a diet. Removal of the heat shrink and stickers will generally save 1 gram, and removal of the balance connectors will save 1 more gram. Of course such modifications void any warranties. Removing the balance connector can substantially reduce the number of cycles prior to loss of performance, but this can be mitigated by limiting flight times such that no more than 70% of capacity is used.

The final detail outstanding is the radio setup. The vast majority of indoor 3D/Aeromusical flying is done on high rates with exponential. No differential is used on any surface, and minimum control throws for each surface are 45 degrees in each direction. 60 degrees of throw is not uncommon on the elevator and ailerons. The settings I use for *George* are listed in the accompanying box.

The small bias in exponential throw on the elevator is really only needed if the c.g. is run at 90mm from the wing leading edge, which is the small bit noseheavy, requiring a small amount of down elevator for inverted flight. At 95mm, *George* will be absolutely neutral (but still very stable) in pitch, with no down elevator needed for inverted flight. The small bias in rudder throw/exponential accounts for torque effects of the mo-



Fiberglass cloth is used to reinforce nose and lock in threaded inserts for the motor mount (above left). Once glued in place, it virtually disappears (above center). The simplest method for mounting the Li-Po is adhesive backed hook and loop fastener (at right, top). Reinforcing the foam underneath the hook and loop fastener with fiberglass cloth increases the strength of the adhesion to the foam. ThunderPower 2S 325 65C ProPower mounted with just enough wire length to connect to the ESC (at right). Removing the Li-Po with a twisting motion greatly reduces the chance of pulling the hook and loop fastener off the foam.

tor. *George* is fully capable of all traditional maneuvers, and most 3D maneuvers, on low rates. High rates make some 3D maneuvers easier, enable more extreme 3D maneuvers, and are beneficial when flying in smaller spaces.

With the selected components detailed in Project Foamy, *George*, RTF, weighed in at 5.2 ounces (147 grams) with stock Li-Po. As a frame of reference, for the 2010 ETOC, I built an *SULTIMATE* for my good friend Donatas Pauzuolis to use as a backup 3D/Aeromusical plane. That 2010 ETOC *SULTIMATE* employed similar reinforcements, but lacked most of the weight saving measures, and weighed in at 5.8 ounces (165 grams).

The bulk of the information presented in Project Foamy is from my personal experience building high performance foamies since 2003, and flying in F3P competitions

since 2007. Substantial information is by way of my interaction with top US foamy designers/builders/pilots at large indoor fly-ins (JR Indoor, KIEF, ETOC); Devin McGrath, RJ Gritter, Andrew Jesky, and Jamie Hicks to name a few. And certainly my knowledge base has benefitted greatly from my good friend, Donatas Pauzuolis (from Lithuania), who is recognized as a top foamy designer/builder/pilot in both Europe and internationally.

The world of foamies is constantly changing, even as this Project Foamy series was written. As Project Foamy concludes, a few significant news bits in the world of foamies:

1) A bit of good news is that F3P event has been elevated from provisional status to full status, and the first F3P World Championship will likely be held in 2015.

2) The most prolific US supplier of

foamies, Fancy Foam, was purchased by E-Foamies, and the two companies have merged, continuing the offerings of both companies (<http://www.fancyfoam.com>).

3) Donuts Models appears to be scaling back its offerings, including the absence of the *SULTIMATE*. However, at or near the publication date of this *FM*, a new foamy company should be online; Donatas Designs, which will offer several original Donatas Pauzuolis designs as well as designs from other noted foamy pilots.

4) Of course a number of other sources for high performance foamy kits exist. See the list of suppliers for these kits and other component materials.

Stayed tuned to *FM* for more foamy news, and feel free to submit any foamy related tidbits/endeavors for inclusion in future *FM* columns. **CC**

Suppliers of Foamy Kits and Components

US, 2mm micro, 3mm indoor, and 6mm outdoor foamies
DW Foamies, <http://www.dwfoamies.com>

Czech, *Click!* F3P, *Jazz 3D*
RC Factory, <http://www.rc-factory.eu>

US, *Excel* for F3P, *Yakhoi* for 3D
SB Models, <http://sbmodelsonline.com>

Czech, *Mercury* F3P, *Viking 3D*
Top Model, <http://www.topmodelcz.cz>

Magnet Wire
www.gobrushless.com

Foamy specific control horn, servo arms, assorted linkage bits
www.radicalrc.com/shop

YGE electronic speed controls
www.f3aunlimited.com

Hacker motors/electronic speed controls, ThunderPower Li-Pos
www.aero-model.com

AXI motors
www.hobby-lobby.com

Spektrum Rx, JR servos, E-flite Park motors, ThunderPower Li-Pos
www.horizonhobby.com

Castle Electronic speed controls
www.castlecreations.com

NeuPro motors
www.neumotors.com



Stock ThunderPower 2S250 Prolite weighs 17 grams. Removing heat shrink, labels, and balance connector reduces weight to 15 grams. Stock ThunderPower 2S250 Prolite weighs 17 grams. Removing heat shrink, labels, and balance connector reduces weight to 15 grams.

George Control Throws

Control	High Rate Throw	Exponential
Aileron	45° up/down	+40%
Elevator	45° up/down	+40% up, +35% down
Rudder	45° up/down	+30% right, +25% left
Control	Low (dual) Rate Throw	Exponential
Aileron	60%	+30%
Elevator	60%	+30% up, +27% down
Rudder	75% left, 70% right	+30% right, +27% left

Carstens **Flying Plans**

All **FM** plans are shipped full size as a black line, high quality, exact copy of the original. Be sure to ask about a back issue or copy of the original construction article of the plan you order.

NEW THIS MONTH



CD427 OPTION 55. Build it for a glow or build it for electric. Either way, the Option 55 will perform beautifully. Spanning 55 inches this model was designed to fly precise sport aerobatics. Model is built of traditional balsa and ply construction, and uses a .55 2-stroke or Power 46 brushless motor. Weighs 5 pounds, 1 ounce ready to fly. Plans on two sheets. Jim Hiller **FM** 11-2011 **\$28.00**



CD428 SKY STREAK. Inspired by a forward swept flying wing model 50 years ago, Larry Renger finally designed his own version. The result was the model you see here, designed for the 1/2A class C/L. Larry set up this forward swept, flying wing model to fly on either a .049 or .061 and 42-48 foot lines. Larry Renger **FM** 11-2011 **\$14.00**

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Miss something? Here's a quick look back October September



CD426 AIRCO DH-5. If you're a fan of WW I biplanes and of easy to build profile planes, this model of the WW I scout plane wins on both counts. Spanning 23 inches this electric R/C model is built of 2.5 Depron foam and uses any 35-watt motor that will turn a 7-3 GWS prop. Weighs 4.8 ounces ready to fly. Plans on one sheet. John Rutter **FM** 10-2011 **\$10.00**

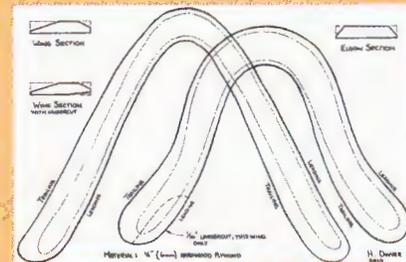


free full-size plan

Zaic Z-15. In a tribute to legendary Frank Zaic, Jim Lueken has designed this simple 15-inch stick and tissue freeflight with a gracious nod to Zaic's designs. **FM** 10-2011 Available as a back issue Howard Dwyer. **FM** 09-2011



CD425 Fireball. Pete Fusco brings the Jim Walker C/L classic into the 21st century by building it as an R/C sport plane. This .80 two-stroke, or .91 four-stroke powered plane 77-inch span model of the timeless classic will certainly get attention at the field. Construction is traditional balsa and ply. Plan on one sheet. Pete Fusco. **FM** 09-2011 **\$11.00**



free full-size plan

Boomerang. The boomerang is one of oldest man-made flying objects in history, dating back to ancient civilizations. Howard Dwyer has drawn a plan for two versions of simple boomerangs that are easily built and fun to fly. Available as a back issue Howard Dwyer. **FM** 09-2011

Attention!

The plan for the vapor Endure O₂ D419) from the June 2011 issue was priced incorrectly. The correct price for this plan is \$5.00. We apologize for the error.

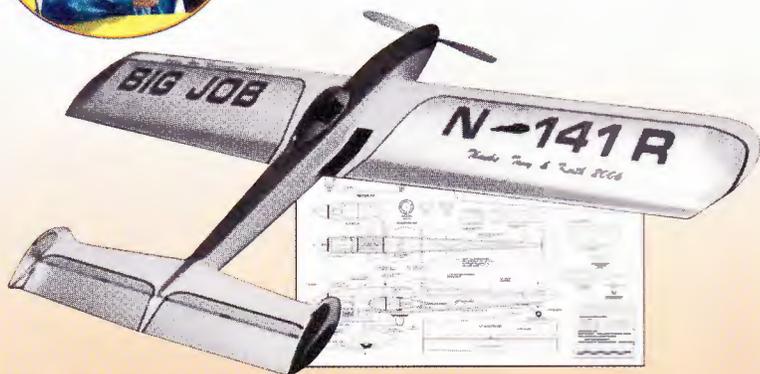
LYNN'S picks

Lynn Good, our *FM* Plans specialist, gives the thumbs up to some of the best FLYING MODELS plans



Lynn Good, in the cockpit of a N.J. Forest Fire Service Grumman AgCat

THE BIGGER THE BETTER



BIG JOB (CD311) April 2007

Addie and Tony Naccaratto certainly knew a good thing when they designed this storied, 54-inch C/L Stunter. Puts in great performance on a .46 2-stroke. **\$11.00**



BIG QUICKIE (CF667) May 1984

Got a yen for some control line racing? Then you might want to look at John Ross's "Big Goodyear" profile racer. Strap a .36 into it and burn up the circles big time. **\$10.00**



BIG CHIPS II (CF728) July 1986

When Turnaround Pattern came to the fore, Larry Phillips decided to build his plane for 838-square inches. With its YS .60 2-stroke he had more than enough. **\$15.00**



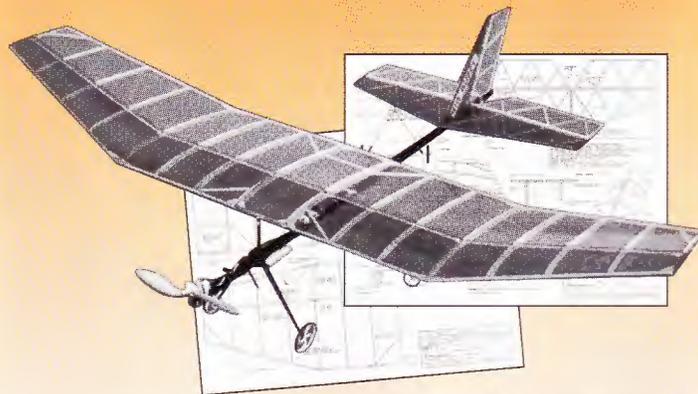
BIG ONE (CF613) November 1982

Command a load of attention when you bring this big 84-inch span to the R/C field. George Buso designed it for that very purpose, to fly the Pattern with presence. **\$28.00**



BIG X (CF554) November 1980

Here's a big, scale ship for rubber power. Doc Mathews designed his 29-inch span, inspired by a Steve Wittman design. **\$9.00**



BIG BUZZY (CF172) August 2002

Floyd Richards joined the indoor R/C movement early on with his big, 60-inch plane, originally powered by a Speed 280. **\$20.00**

All these "big" planes yield a bigger and better quotient of great flying!

FAC 2011 *Non* NATIONALS



By Jim Wiggin

It may have been a Non Nats year, but the competition was as great as ever!

PHOTOGRAPHY: JIM WIGGIN

In 1988, my best friend and flying buddy, Craig, and I would study the pages of this very magazine with hopes of learning more secrets to the constant endeavor of the OOS flight of our latest balsa and tissue models. We read with interest Earl VanGorder's column "Flyin' Things for Fledglings", and were amazed at the many freeflight models created by guys like Don Srull, Mike Midkiff and Dave Rees, just to name a few. No better highlight for us was the FAC Nationals.

True, in 1988, the FAC Nats was only six years old, but to Craig and I, Geneseo took on a reverence, much like Fenway to the Red Sox fan, or Daytona to the racing fan. How we begged and pleaded to have our parents drive us to this enchanted field of dreams!

Fast forward to 2011 and my time here at FLYING MODELS and a conversation with Editor, Frank Fanelli. I believe the conversation went something to the effect of, "You know, the FAC Non Nats is taking place this July in Geneseo, New York. Would you like to go and cover the event?" I'm not sure if I ever let Frank finish his question or not, but as soon as he said Geneseo, I was ready to go.

My trusty Jeep and I arrived at HAG Field in Geneseo on Wednesday afternoon. To say the winds were blustery would be an understatement; the flags and a few Mylar streamers that had been set out were virtually horizontal. I made my way up to the hangar and met up with FLYING MODELS Columnist Stew Meyers and Dave Mitchell who both helped me to complete my registration. I brought along a few airplanes to

fly and even originally entered two of them in Modern Civil; however I had too much fun trying to cover all the action that would take place the following two days.

The hangar was filled with both model aircraft as well as full scale as HAG Field is an operational air museum. One by one, another masterpiece was placed on a table. The overwhelming sight of so many stick and tissue aircraft in one area was only surpassed by the variety of models. Another great surprise was to see some young people, a few the same age I was when I first read of Geneseo, attending with models in hand.

Judging started around 2:00 and continued throughout the afternoon. The judges had their work cut out for them as they studied each model and compared it to documentation and three views. Other models such as those of the Embryo, Jimmy Allen, Old Time Stick and Cabin and a new class, ½ Wakefield were all inspected for class compliance. The winds outside the hangar had me concerned however. If they continued at this rate, things could get interesting real quick. Judging commenced at a steady rate, I was amazed at the proficiency and organization of the judges and volunteers.

As I loaded up the Jeep to head back to my hotel room, we all noticed a crew working on a full scale C-47 *Skytrain*. That's a DC-3 to you civil guys. We were all treated to a wonderful sight when the crew started up the twin Wright R-1800 Cyclones. Later, this aircraft would depart and serve as an appropriate backdrop for a day's worth of events.

Thursday morning I arrived at HAG Field at 7:00 a.m. The grass was heavy with the morning's condensation and already a few models were in the air undergoing flight trimming, while other aircraft were being readied in the pits. We were blessed with a clear blue sky and light winds out of the west. The DC Maxcutters were the host club for this year's event and the volunteers from the club did a great job in organization and planning. In an effort to provide results faster than in years past, computers and electronic tablets were used this year.

Dave Mitchell got the day started with a morning pilots' meeting and ran down the schedule of events. With just a light wind and clear blue skies, no one waited too long before getting their creations in the air. One of the larger models was Chris Starleaf's majestic B-24 *Liberator*. When Chris walked to the center of the field with the *Liberator*, most stopped and watched. Chris had one scary flight that ended with a hard landing, but thanks to his design skills and building, the model was easily repaired and was flying again.

Before long the PA system rang with the news that the first mass launch was about to begin. The early warbirds of the Great War were to make their way to stage center. Eighteen World War One crates took to the early morning sky and put on an impressive aerial display. In the end, Chris Starleaf with his Pomilio PE would place third, Wally Farell with his Martincyde would place second, and Tom Nallen II would place first with his Dorand AR1. His very first flight



FM columnist **Stew Meyers** and **Dave Mitchell** (at left) check in pilots and models on Wednesday in the HAG hangar. Soon the Jumbo Scale table would be overflowing with large-scale rubber jobs. Here the hangar is filled with aircraft, both model and full scale (above).

garnered an astounding 200 seconds.

Soon thereafter the next mass launch, the WWII, took place. In all, 31 aircraft took part, the largest participation of all the other mass launches. While the skies were filled with *Mustangs*, *Spitfires* and Me-109s, it was the lesser known warbirds that brought the duration. Andrew Ricci placed third with his *Fairey Barracuda*, Paul Stott placed second with the little known Fiat G55 and Richard Zapf clinched first with his Luftwaffe Heinkel 112.

Throughout the day, models of every size and shape took to the air. Mike Escalante put some flights on his Embryo class *Born*

Loser biplane. With its two-tone purple and pink scheme, the plane was hard to miss, despite its size. Mike built the Al Blackstrom-designed Embryo from FLYING MODELS plans featured in the October 2000 issue. You can also download these plans as well as others free at www.flying-models.com/centerfold/.

Mike painted the little model with floral acrylics in bright colors for his daughter Erika, but Erika, age six, did not show up to the event empty handed. With Mike's guidance, Erika built her own Embryo class model based on her father's design. Not only did Erika's plane fly, but also it finally flew out of sight! While we were all impressed

with Erika's performance and subsequent offering to the god of Hung, she did not share our enthusiasm as she saw it as a model lost. However as time went on, she grew excited realizing that she would build another one.

Erika was probably the youngest modeler at the Geneseo, but fortunately she was not the only one. Pete Azure brought along two young aspiring modelers, his grandsons, 15-year-old Connor and 13-year-old Raven Azure. Remember that name Azure folks, you'll see it more often I'm sure. Both young men came to the event with models they built and covered. Thanks to grandfather



Frank Rowsome pauses in the judging while Mathew Kinl's Jumbo Scale *Curtis Sparrowhawk* awaits its turn for static judging (above left). FAC Scale is a feast for the eyes and features models of scale aircraft one does not see very often, as witnessed here (above right). Everything from the French Caudron *Simoun* of Lou Martin, to the Boeing 306B flying wing of Dallas Cornelius is seen here.

Judging the models started on Wednesday at 2:00 and progressed well into the late afternoon. Don Srull and Frank Rowsome (below left) look over John Regalbutto's Douglas XTBD-2 *Sky Pirate*. The crew of the C-47 (below right) power up the twin radial engines in this "Gooney Bird" of WWII era. Seeing these old aircraft in flying condition warms the heart of any modeler.



2011 FAC Non Nats



Thursday and Friday were busy and the flight line was lined with awnings with pilots reading their aircraft (above left). The F6F Hellcat in the background is full-scale and now serves the field as a weathervane! The impressive B-24 Liberator of Chris Starleaf banks over the field under a cloudless sky (above right). Moments such as this are what the freeflight modeler lives for. Watch



your six! The early era warbirds take to the calm New York sky in search of the perfect timed flight (below left). This year would see many WWI "crates" get plenty of hang time in the calm July air. Tom Nallen II's Dorand AR.1 (below right) puts on a majestic flight during the WWI Mass Launch. The model would end up first in the WWI Mass Launch event.



Pete's guidance, they also flew well. Connor built an Easy Built Models *Dart* and expertly covered it in black and red tissue, while Raven, his younger brother, built a *Baby Hornet*.

Both models benefited from the years of experience handed down from Grandfather Pete and the performance in finish and flights were beautiful. The afternoon gave

witness to many modelers putting in their official time. The sound of "Can some one time this?" could be heard over the sounds of winders and lighthearted conversation and laughter. FAC modelers are a relaxed bunch of guys, reveling in the pursuit of their fellow modelers' achievements. It is not uncommon to hear "Atta boy!" or "Nice flight, great job!" from these modelers. Un-

like other competitive events, everyone here is approachable and there are no secrets, the pursuit of that perfect flight is everyone's goal.

Fellow competitors visiting in each other's pits are also common and sometimes lead to modeling fun. This was no better illustrated than with the pairing of Don Srull and Tom Nallen II bringing Westland *Ptero-*



The times, they are a changing! Dave Mitchell (at left) calculates and tabulates results with the benefit of an electronic tablet. A pair of *Pterodactyls* (above) is witnessed here, built by Tom Nallen II on the left and Don Srull on the right. Tom's model is based on the Mk. V and is rubber powered, while Don's is the later Mk. VII variant and is electric. Both models would place first in their respective classes.



Mike Escalante prepares the *Born Loser* by packing in the winds (above). The pink biplane was easy to see in the crystal skies. Mike releases the Embryo *Born Loser*, built from FLYING MODELS plans, into a clear blue sky (at right). The model is covered with Japanese tissue and painted with floral acrylics.



dactyl models to the event. Rare aircraft to say the least, and having one at a meet is unusual, but two? Tom's *Pterodactyl* is the Mk. 5 and is rubber powered, entered into Jumbo Scale, while Don's is the later Mk. 7 variant and was entered in Power class. Both models were masterfully built and finished but were certainly not static models. Both went on to win first place in their respective classes! My day had been spent with camera in hand and either walking or biking to each mass launch or witness another flight. Before I knew it, Thursday was done.

Friday morning was different in name only as the conditions were much like Thursday. The winds did pick up briefly in the afternoon, but had subsided around 3:00. With fighter planes from WWI and WWII out of the way the day before, it was time to see how racers would do in the mass launches. With 26 entries, the Greve was the most popular of the racing aircraft class, and the most popular model was the *Chambermaid*. It was a *Chambermaid* of Jerry Crawler that would clinch first place, followed by Wally Farrell and his *Mr. Smooth-*

ie in second and Jim Detar bringing in third with his *Miss Los Angeles*.

Watching so many of these airplanes in the air at once can be dizzying, but fortunately the modeler's spotter/timer helps keep eyes on the appropriate airplane. The Thompson Mass Launch had a total of 14 entries this year and had some great flights. Rich Weber gained first with his *Simplex Racer*, followed by Jim Detar and his *Altair* in second and Wally Farrell in third with his *Mr. Mulligan*.

FAC volunteers kept the events moving along at a steady and organized pace and soon had the Goodyear Mass Launch ready to go. There were ten entries in this year's Goodyear mass launch but the competition was fierce. In the end, it would be Richard Zapf bringing home gold with his Hutchen-son WLH-1 followed by Richard Gorman in second flying a Sonerai and Dallas Cornelius in third with a Long LA1.

With mass launch events done, I spent some time enjoying some of the old time and endurance models and speaking with the modelers. While talking to Dave Pishney, I learned of a new FAC event that both he and Gordon Roberts have been working on. The

event is the Half Wakefield and is literally what it sounds like. Models that are half size reductions of popular Wakefield models are used in the event. No changes to the plans can be made; however, eliminating every other rib in the wings is acceptable. You can read the complete rules on this new and exciting event at <http://www.flyingacesclub.com/halfwakefield.pdf>.

This year was the first time this event was held to my knowledge and should become popular quickly as flying fields are getting smaller. Dave explained the new event to me while he prepared and subsequently flew his 1951 designed Keith Horry ship. In all, this new event had seven contestants and proved popular. Don Srull placed first with his Swedish Wake, Dave Pishney came in second with the aforementioned Keith Horry and Rich Weber came in third with a *Half a Wake*.

Perhaps you might want to try this new event? David Niedzielski of Easy Built Models was on hand and introduced his new *Half a Wake*, which is a laser-cut kit that features lightweight balsa, Easy Built Lite tissue, TissueCal and yes, it is eligible for this



Young six-year-old Erika Escalante launches her Embryo model (above left), which her father designed. Erika just might have a future in freeflight as the model went out of sight! Proving that there are still some young guns out there, 13-year-old Raven Azure (above center) starts packing the winds into his newly completed *Baby Hornet*. 15-year-old Connor Azure (at right) showed up with his Easy Built Models *Dart*. Connor's skills in building and covering are evident here and the model went on to fly quite well.

2011 FAC Non Nats



A beautiful flight of a beautiful aircraft. Lou Martin's Caudron *Simoun* (above left), slips by the camera on just one of many perfect flights. *Miss Canada* (above right) sure looks pretty in her white and red dress and that clear blue sky adds the perfect backdrop to another perfect flight. Pete Azure built and flew this *Miss Canada* Cabin model. And they're off! The Goodyear Mass Launch



event (below left) had ten entries. After the dust settled, Richard Zapf would win the gold with his Hutchenson WLH-1. Dave Pishney launches his magnificent *Light Weight* (below right). The model, designed by Mike Furthor in 1942, continues to be a competitive endurance model. Scenes like this were a common occurrence as the weather this year was near perfect.



new event! After seeing Dave's sample built up at his table, I declared to myself that resistance was futile and promptly purchased one. Dave has these kits in stock if you want an easy way to try out this new event, so get building!

Dave also brought enough kits and sup-

plies to keep everyone happy. Once in a while he would sneak out, however, and get a flight in such as the one he got with his Aeronca *Champ*. On the way back to my pit, I bumped into Tom Arnold and his beautiful *Fairey Firefly*. Readers of FLYING MODELS know that Tom Arnold is no



stranger to designing and the very model he was about to launch was the subject of a construction article featured in the July 2010 issue (plan #CD399). This version is the training variant and has the twin bubble canopies.

After release the model climbed up at a



New this year was an unofficial event that's slated to be a new official event at the 2012 Nats. Dave Pishney is the main force behind this event, the 1/2 Wakefield category. Here, David (above left) launches his 1951-designed Keith Horry ship. The half sized Wakefield went on to finish second in this new event.



Gordon Roberts and Dave have worked on rules for the 1/2 Wakefield event of the Flying Aces. Easy Built Models has introduced a model that is eligible for this new event, the *Half a Wake* (above right). The kit includes contest weight, laser-cut balsa and is the perfect introduction into this new event.



Dave Niedzielski of Easy Built Models was on hand with his booth filled with kits, props and other freeflight essentials. Here Dave takes a break (**above left**) and launches an Easy Built Model Aeronca *Champ*. The model is laser-cut and makes for a great first scale model. In the moment just before release, Tom Arnold readies his Fairey *Firefly* Mk. 1 for flight (**above right**). The model is based on Tom's own plans and was featured in the July 2010 issue of **FM**. Plans for this model (CD399) are available through the FLYING MODELS Plans



Service. Caught at the moment after release, Charlie Santer launches his P-51B in preparation for the WWII Mass Launch (**below left**). The scratchbuilt model consistently put in great flights all three days of the event. Even the big boys have a bad day (**below right**). This Beech *Bonanza* had stalled and crash landed on the active runway the weekend before. Fortunately the pilot and occupants were not seriously hurt in the incident; unfortunately the vintage Beechcraft *Bonanza* looks like a total write off.



Dallas Cornelius shows off his new Jumbo Scale Beechcraft *Bonanza*. Fortunately, this *Bonanza* fared better than the full scale that could be seen at the end of the active runway.

steady clockwise pattern. I'm sure both of us stood there, heads up, eyes locked on the model, perhaps mouths open ever so slightly, as the model took on a translucent look as the sun passed through its tissue covered frame. "I love this stuff" said Tom. I couldn't agree more.

I also caught up with Charlie Santer as he was just about to launch his P-51B. I was able to catch the model with a photo just as it left his hand in what has to be the favorite photo of any freeflight modeler. Throughout the weekend, Charlie put in flights with this model and it always looked good. Hard to beat a *Mustang*. Almost at cue, a full size *Mustang* did a high speed pass over the active runway, its Rolls Royce Merlin engine reverberating nicely off the hills of Geneseo. As stated earlier, HAG Field is an active full scale airport, so the occasional Piper *Cub*, *Decathlon*, Aeronca and even B-17 and C-47 landing and taking off were all par for the course.

Unfortunately, one full-size Beech *Bonanza* was not so lucky. Turns out the previous weekend the aircraft was involved in a minor incident, which was caused by a stall on landing. At the time the officials were still looking into the case. Fortunately the pilot and the occupants were not seriously injured but the vintage Beech probably will not fly again.

Dallas Cornelius had a bit more luck with his Jumbo Beech *Bonanza*, and like anything Dallas builds, it was a beauty. This was its first time out so he mainly spent time performing trim flights with it.

All too soon, the day was coming to an end and the PA system announced that all official times had been turned in, calculated and awards were ready to be given out. Ross Mayo and the always entertaining Vance Gilbert announced and handed awards to the winning contestants. At the very end, Ross Mayo declared Richard Zapf as this year's Grand Champion of the 2011 FAC Non-Nats. With plenty of daylight and good weather left, many felt compelled to continue flying, and who could blame them? In all, 100 modelers signed up with a total of 96 competing, had a great weekend of flying, fun and fellowship.

It was 23 years ago when Craig and I read about that enchanted field tucked into the hills of Geneseo, New York. As my Jeep left a small dust cloud behind it leaving HAG Field, my head was filled with everything I had experienced the previous three days. Finely crafted models, out-of-sight flights, names of the past, future modelers, friendly people. While this was my first time at Geneseo, it won't be the last.

Fan **Facts** by greg moore

You can reach **Greg Moore** via e-mail at jettflyr@comcast.net

Hello again! What a long, strange trip this month has been. It began with small electrics, evolved into flying .60 sized props because of our ferocious 90-degree crosswinds, morphed into e-mail conversations concerning 120mm fan-sized scratchbuilt edfs, evolved into watching 42-pound world class airplanes (and wishing I was flying some of them) then transformed into doing the maiden flight on our club's newest turbine wavered pilot's DV8R (fun!) and finished with the only jet event less than 600 miles from home. I'm tired again just from writing this!

In my mind, the neat thing about our hobby, and our little sub-set of jets (*regardless* of power source) is the passion, camaraderie, attention to detail and fun that most seem to have. I am developing a fascination with the Phase-3 *Squall*, and the F-16 that one of my fellow PPRC members brings out to fly, change the battery and fly, change the battery and fly (you get the idea) regardless of the wind or temperature ... and all as "box-stock" with really nice performance! Don't get him started on the capabilities of some of these smaller arfs unless you have an hour or so!

Now go up in weight 30-or-so pounds to Brian O'Meara's Skymaster F-4, and ask him about the kick-in-the-pants fun it is, and you quickly forget that we are adults, not kids on the playground ... fun stuff!

Elsewhere in this issue is my review of the *ElectriFly F-20*, but I need to put in a few more words about how much fun it is. An evening's work is all that is required to get it in the air, good tough AeroCell foam takes abuse well (and I have certainly given it the test!) and it looks and sits "just right" in the air. Even though you can't taxi out, commit aviation and taxi back to the pits, it is an



PHOTOGRAPHY: GREG MOORE

Brian O'Meara's 105-inch span, Grumman Me-262-C streaks over the trees headed for a strafing run at Jets Over Colorado. The single engine in the fuselage, exhausting through the tail, provides simplicity to a very complex aircraft. Brian flies it a lot and doesn't baby it!

airplane that is *well* worth your time to look into (and yes, my Phase-3 flying compadre is doing just that).

I mentioned that I attended Jets over Colorado, which was a rescheduled event given the monsoon rains we had in May (and almost zero rainfall since), and was a very low-key affair with only 25 pilots. We had several new airplanes there, and as I mentioned, a waver was earned. Shazam Kianpour brought his new *UltraBandit* and it lived up to its name, it was ultra! In fact, he was having so much fun exploring its huge flight envelope that he ran it out of gas, but the airplane maintains energy wonderfully and the resulting landing was perfect—on the numbers and the center line. While not

a plane for any/everyone, it is a large and wonderful model.

I had the opportunity to get my hands all over the new Modellbau-USA F-86D. Very nice glasswork, well built and covered wings and tail feathers and upgraded Spring Air landing gear at an attractive price. More as I get to see the plane come together!

Brian O'Meara always seems to have several desirable planes, and one of the nicest F-4 *Phantom's* that I've seen. This rendition is from Skymaster, but the weathering is fantastic, looking as if it has sat in the hot sun and rain with dirt/oil marks flowing aft and subtle weathering downwards, even the bottom has been nicely dirtied. Oh yeah, it flew great too, spending as much time up-



Brian O'Meara's Skymaster *Phantom* (above) touches down after another flight. To Greg's eyes, it seems to fly lighter and smoother than others he has seen. The weathering is done up to a very high level, and really has to be seen to be believed. Greg's *ElectriFly F-20* burning up the sky, yet again (above right). Even though it lacks wheels, it has become an every weekend flyer for him. Shazam Kianpour's new *UltraBandit* (at right) takes to the sky in Fort Collins, CO. Done up in a standard BVM color scheme it shows up very well in the sky and flies even better than it looks.





Mike Kranitz's Chinese Styrofoam® ARF of the C-17 *Globemaster III* (above left) flies very well on its stock motors and fans with a 4S 4000 mAh battery pack, also being capable of dropping paratroopers out the rear cargo door. Flight times with the stock setup average around five minutes. Bill Eustace was



bit by the jet bug and decided to scratch it with this Troy Built Models *DV8R* (above right). Powered by a Jet Central Cheetah, it is a tremendous value as an entry-level sport jet, whose capabilities are very difficult to outgrow. For those looking to enter turbine power, this may be an excellent model.

side down as it did right side up.

Brian also brought his large (105-inch span) Me-262-C, from a Grummania kit. A single turbine exhausting through the tail, rather than two in the wing's nacelles powers it. The full-scale "C" version had a rocket in the tail for faster take-offs, but it does provide a nice option for us modelers! Brian throws this plane around the sky like his big *Boomerang-XL* ... no babying this airplane; he brings it to fly it!

In the past 10 months, it seems like we

haven't had a calm day, but we sure did at the event. Dan Brunson filled the smoke tanks on his CARF *Flash* and tried to tie a knot with the smoke. The smoke just hung and hung and hung, which provided some interesting visuals a bit later in the flight! I'm not a huge smoke fan, but seeing the figures and trails just laying in the calm air makes me think about using the capability more often!

Also attending the event was Mike Kranitz. He not only brought along his beau-

tiful turbine powered helicopter, but his Styrofoam ARF of the C-17 *Globemaster III*. Mike uses the stock setup with a 4S 4000 mAh battery pack to give about five minutes of flight time, and like the full-scale version, he can drop paratroopers out the open rear doors.

Bill Eustace took the plunge with a Troy Built Models arf of the *DV8R*. This plane is just flat-out fun. It slows to a crawl, and with a good headwind, I wouldn't be surprised if it could land going backwards with full flaps; yet give it the throttle and it gets up and scoots along nicely. For those looking for a larger airplane as a first turbine-powered jet, this one certainly works as a nice trainer, and has the performance to keep boredom as only a distant fear.

SKS productions will have a video out soon covering the Jet World Master. Scott Stauffer sat in the sun and drizzle from before the opening ceremonies and in the dim lighting of the banquets up to the very end. As with all SKS videos, you can bet it is first rate and worthy of a closer look with gift-giving season just around the corner!

Finally, I'll close with a link to a mini-photo album covering the 9th Jet World Masters that was held at the National Museum of the United States Air Force in Dayton, OH this summer. T.J. Rohyans has captured the essence of the event and come up with an affordable book for the "jet-jockey" that you can never find the correct gift for. More information can be found on his website at: www.blurb.com/bookstore/detail/2408007.

Until next time, fly safe and trust in thrust! 

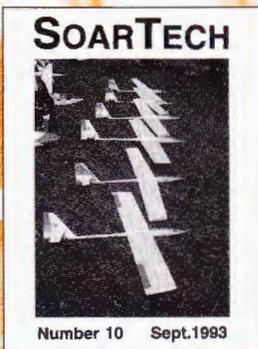


Dan Brunson was burning up the smoke oil on a very calm day trying to tie knots with the smoke (above left). His CARF *Flash* provides a stable platform. T.J. Rohyans has completed a mini photo album covering the 9th Jet World Masters that was held in Dayton, Ohio this past summer (above right). Text has details.



2011 Upcoming Events

4th Annual Mid Georgia Jet Rally	Oct. 28-29	Located at Hodges Hobbies, Andersonville, GA	www.hodgeshobbies.com
Sin City Jets	Nov. 3-5	Las Vegas, NV.	www.sincityjets.com
Pensacola Jets 2011	Nov. 11-13	Holley Field (Naval training), Navarre, FL	
Mako's Jet Club	Nov. 21-13	Miami, FL	www.makosrcjetclub.com
1st Annual Markham Park Jet Rally	Nov. 18-20	Sunrise, FL	
Arizona Jet Rally	Nov. 18-20	Superstition Airpark; Mesa AZ	www.azmodelaviators.com



BOOK

Whether you're a seasoned pro at hunting thermals or riding the slope, or just a novice at really quiet flight, there's something for you in one or all of these books.

Beginners

BUILDING & FLYING CONTROL LINE MODEL AIRCRAFT (C00058) Sarpolus. There are hundreds of photos, illustrations, how-tos, helpful tips and short cuts in this book for the control line enthusiast. 64 pgs.; Sftbd. \$7.95

INTRODUCING R/C MODEL AIRCRAFT (A11113) Burkinshaw. An informative guide, by the former editor of RCM&E magazine, to the areas of R/C model aircraft that most confuse most beginners. Illustrated. 108 pgs.; Sftbd. \$7.95

Choppers

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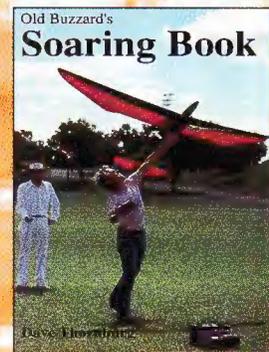
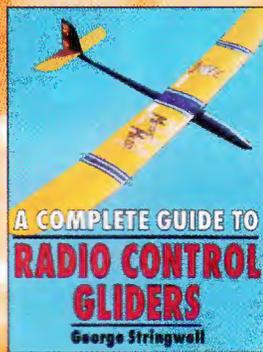
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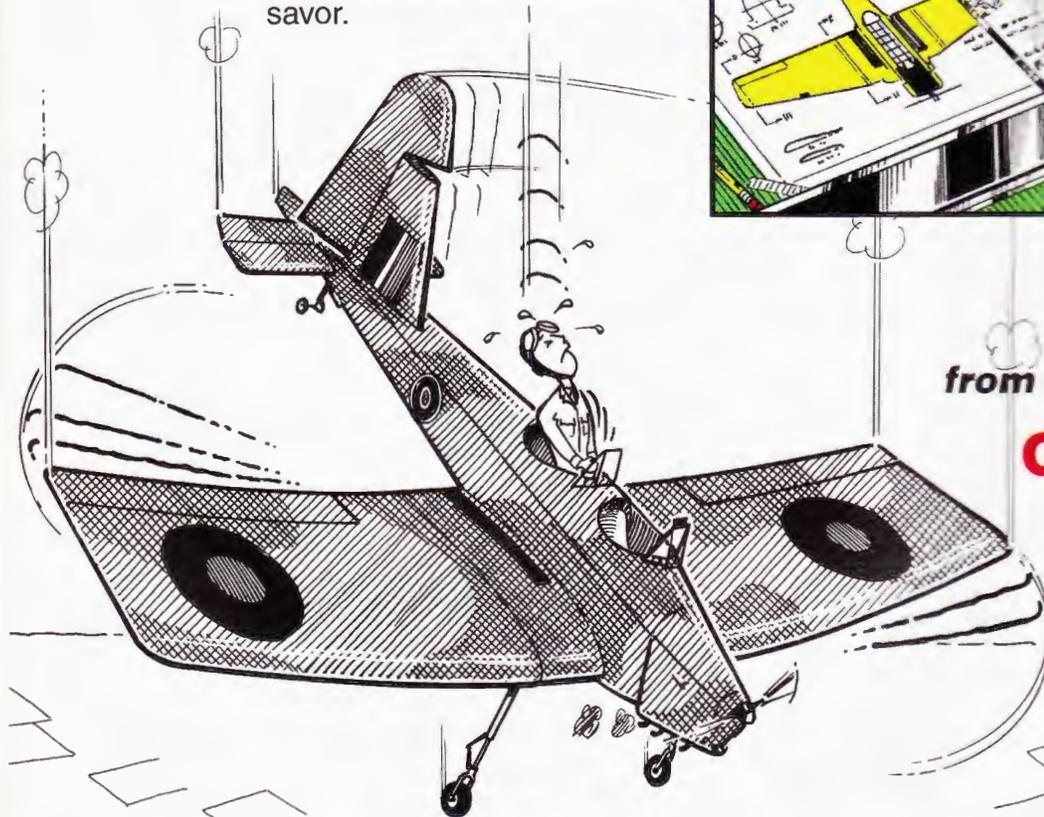
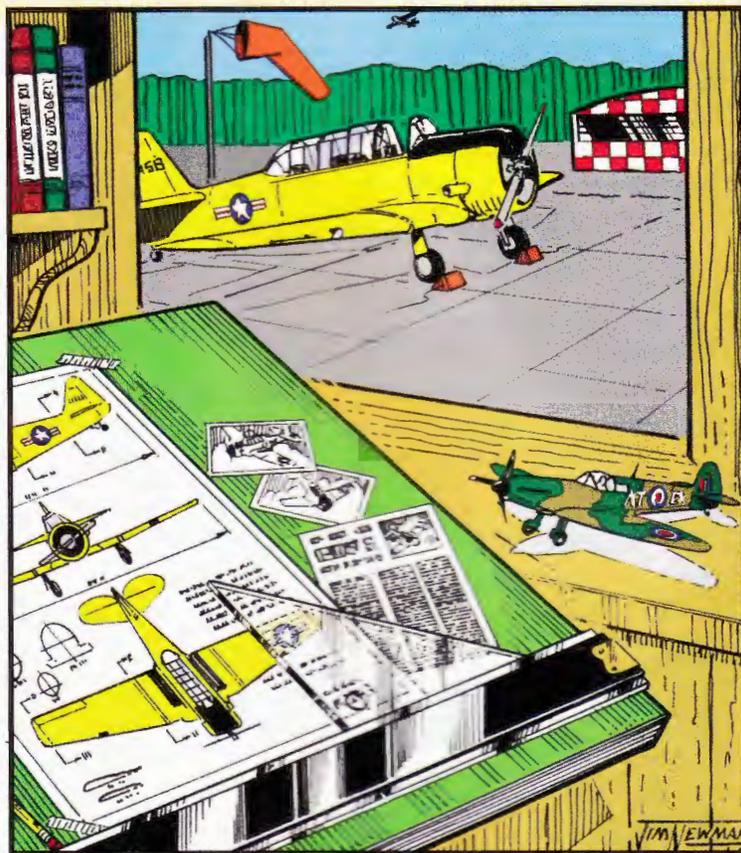


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838	3/32 x 1/2	0.42
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129	1/8 x 1/8	0.28
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130	1/8 x 1/4	0.34
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106	3/8 x 3/8	0.79
107	1/2 x 1/2	1.00
108	3/4 x 3/4	1.36
109	1 x 1	1.72
110	1-1/2 x 1-1/2	3.22
111	2 x 2	5.37

36" Trailing Edges

100	3/16 x 3/4	0.79
099	1/8 x 1/2	0.72
101	3/16 x 1/2	0.72
103	1/4 x 5/8	0.79
118	1/4 x 1	0.94
102	5/16 x 3/4	0.86
119	5/16 x 1-1/4	1.08
120	3/8 x 1-1/2	1.36
121	1/2 x 2	2.15

90 Degree Tapered Aileron & Elevator Stock - 36" Lengths

224	1/4 x 1	1.43
225	1/4 x 1-1/4	1.65
226	1/4 x 1-1/2	1.79
227	1/4 x 2	2.00
211	5/16 x 1-1/4	1.14
228	5/16 x 1-1/2	1.86
229	5/16 x 2	2.08
212	3/8 x 1-1/4	1.36
230	3/8 x 1-1/2	2.08
231	3/8 x 2	2.37
232	3/8 x 2-1/2	2.51
213	1/2 x 1-1/2	1.43
214	1/2 x 2	2.15

48" Lengths

236	1/4 x 1	2.28
237	1/4 x 1-1/4	2.53
238	1/4 x 1-1/2	2.85
239	1/4 x 2	3.18
215	5/16 x 1-1/4	2.85
240	5/16 x 1-1/2	2.93
241	5/16 x 2	3.34
216	3/8 x 1-1/4	3.16
242	3/8 x 1-1/2	3.18
243	3/8 x 2	3.66
244	3/8 x 2-1/2	3.99
217	1/2 x 1-1/2	3.25
218	1/2 x 2	4.15

Blocks

196	2 x 2 x 2 (Three For)	2.07
197	3 x 3 x 3	1.52
245	1 x 2 x 6	0.89
246	2 x 2 x 6	1.44
247	3/4 x 3 x 6	1.03
248	1 x 3 x 6	1.38
249	2 x 3 x 6	2.13
599	3 x 3 x 6	2.54
250	1 x 4 x 6	2.03
251	2 x 4 x 6	3.07
252	3 x 4 x 6	4.66
198	1 x 2 x 12	1.99
253	3/4 x 3 x 12	1.93
199	1 x 3 x 12	2.75
200	1 x 4 x 12	3.98
201	2 x 2 x 12	2.62
202	2 x 3 x 12	4.27
254	2 x 4 x 12	5.77
255	3 x 4 x 12	8.63
112	1 x 2 x 36	5.57
113	1 x 3 x 36	8.04
114	1 x 4 x 36	11.26
115	2 x 2 x 36	8.12
116	2 x 3 x 36	12.94
256	3 x 3 x 36	16.49
257	3 x 4 x 36	31.20

Birch Motor Mount Stock

748	3/8 x 3/4 x 12	0.71
749	1/2 x 3/4 x 12	0.81
750	5/8 x 3/4 x 12	0.87
751	3/4 x 3/4 x 12	0.92

Landing Gear Blocks Grooved

208	1/8"	0.87
209	5/32"	0.87
210	3/16"	0.87

Hardwood Dowels

355	1/8 x 36	0.21
356	3/16 x 36	0.23
357	1/4 x 36	0.29
358	5/16 x 36	0.35
359	3/8 x 36	0.46
360	1/8 x 48	0.29
361	3/16 x 48	0.32
362	1/4 x 48	0.35
363	5/16 x 48	0.46
364	3/8 x 48	0.58

Miscellaneous Assorted Wood

598	Bag-A-Balsa Sheets & Sticks	8.06
599	Bag-A-Blocks (when available)	9.13
699	"Seconds" Wood Box (when available)	39.95

24" Basswood Sticks

900	1/32 x 1/8	0.14
901	1/32 x 3/16	0.17
902	1/32 x 1/4	0.18
903	1/32 x 3/8	0.24
904	1/32 x 1/2	0.34
908	1/16 x 1/16	0.13
909	1/16 x 3/32	0.14
910	1/16 x 1/8	0.16
911	1/16 x 3/16	0.18
912	1/16 x 1/4	0.23
913	1/16 x 3/8	0.32
914	1/16 x 1/2	0.38
918	3/32 x 3/32	0.16
919	3/32 x 1/4	0.23
920	3/32 x 3/8	0.37
921	3/32 x 1/2	0.46
924	1/8 x 1/8	0.17
925	1/8 x 3/16	0.21
926	1/8 x 1/4	0.26
927	1/8 x 3/8	0.40
928	1/8 x 1/2	0.54
931	3/16 x 3/16	0.24
932	3/16 x 1/4	0.30
933	3/16 x 3/8	0.48
934	3/16 x 1/2	0.58
937	1/4 x 1/4	0.40
938	1/4 x 3/8	0.50
939	1/4 x 1/2	0.70
942	5/16 x 5/16	0.50
944	3/8 x 3/8	0.67
945	3/8 x 1/2	0.85
947	1/2 x 1/2	1.11

36" Basswood Sticks

680	1/16 x 1/8	0.29
681	1/16 x 3/16	0.31
682	1/16 x 1/4	0.35
683	3/32 x 1/8	0.36
684	3/32 x 3/16	0.37
685	3/32 x 1/4	0.38
278	1/8 x 1/8	0.29
610	1/8 x 3/1	