



*With transmitter perched high atop Mount Excess Carbohydrate, (see text), one prone Owen Kampen ponders joys of the good life, a calm, slow, soaring beast in a blue sky overhead . . .*

*If you are reaching that mellow age, perhaps we might suggest:*



FRENCH-BUILT POWERED SOARER . . .

# ALPAVIA "RF-3"

by Owen Kampen

FULL SIZE PLAN AVAILABLE THROUGH "MODEL PLAN SERVICE"



◆ Once upon a time a wise man remarked to his not so wise friend that "one cannot enjoy the Spring and the Fall at the same time," whereupon his friend replied, "oh yeah." Interestingly enough, this chance dialogue eventually evolved into a basic theory of aerodynamics which has come to be known hereabouts as "Kampen's Law" i.e. "A model airplane has got to be this or that but not both—except sometimes."

This is one of the sometimes, for if scale planes delight you but seem to lack something in flyability unless powered by 1½ horsepower and do 67 mph which ties your stomach in knots, and on the other hand the model type models which fly like birds insist on looking exactly like everything but a real airplane, then take heart for help is on the way in the form of the "RF-3." Those of you who enjoy knotty stomachs and square slabs may now leave, while the rest settle down to learn how this dandy scale type semi-sailplane came into being.

Those of you who have tried designing models know that no two are alike

# RF-3

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Simple in line, low in cost, yet the ship has universal appeal. This ship builds fast, delivers superb performance in calm air conditions.



A high aspect ratio, the graceful form of a glider. Relaxing to fly.

Sits low and cute on the runway, stabilized by wing skids. Could be modified for a retracting belly wheel and folding skids for purists.



and some "just sort of happen." This particular "happening" began in the summer of 1964 on one of those very special days that left an indelible impression on my memory. The occasion was a flight to Oshkosh, Wisconsin, with fellow MARCS member Carl Mohs in his immaculate Cessna. The purpose was the fulfillment of a near lifelong wish—the chance to meet Steve Whitman. The mission was accomplished and we spent a most wonderful half hour alone with the man and his airplanes, "Buttercup," "Tailwind" and "Bonzo" plus assorted antiques in various states of repair. We talked of flying and designing and he quietly explained his rather pragmatic approach to the latter which seemed to consist of some inspired theorizing, followed by a considerable amount of trial and error. He observed the whole science of aerodynamics was "about on a par with weather prediction." I was inclined to agree at least as far as my own experiences were concerned.

Talking of flying, he mentioned that on his recent return from Reno he had stopped in South Dakota to attend the National Soaring Meet and as it was about the only kind of flying he had never experienced, he felt he would someday like to give it a try. In answer to my comment regarding the unsuitability of the flat local terrain he remarked that "our Wisconsin thunderheads were pretty plentiful and could make for a bit of excitement." I suggested that I was getting a little old for that sort of excitement. Later we helped him wheel out his 165 hp "Tailwind" and then taxied after him. Before we cleared the traffic pattern he was out of sight.

Along about now some of you more alert ones should be beginning to mutter, "Well, that's all very interesting but what in the blue-eyed world has all of this got to do with that beautiful French airplane designed by Rene Fournier?" Patience, friends! The answer is really very simple. You see, while we were having lunch at the airport, I picked up the 1964 Aug./Sept. issue of Air Progress magazine from the newsstand and what did I spy but a flight report on this remarkable bird. It was love at first sight and I knew I must have one. The Wisconsin terrain would no longer be a barrier to soaring, for a modified VW engine delivered enough pull to move this beauty at better than 100 mph and gave it a practical ceiling in excess of 15,000 feet. With a device to re-start the engine in the air and a glide ratio of 18:1 paying tribute to its clean lines, a would-be soarer could at last have his cake and nibble on it too.

Naturally I was most chagrined to learn that deliveries to the U.S. were

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not being considered at that time. Actually I was chagrined at not having the money even if they were being delivered. Then about a month later I flew my first real sailplane at the EAA Meet in Rockford, Illinois, and after the heavies of World War II, this was the closest I had ever come to really flying. I soon found I couldn't afford one of these either. What a quandry—here I was hooked on soaring but grounded by a flat wallet.

As all of you adults surely know by now, a sign of maturity is the ability to adjust to reality, so with all this reality to adjust to I reached a remarkable conclusion. If I couldn't have a big one, I would build a little one. So did I build an RF-3? Well, no—matter of fact I built a highly modified Zaic "Floater" out of a 20 year old kit which had been gathering dust in a friend's cellar. This 6-footer with a Cox T.D. .049 filled my whole next summer with joy. Many long evenings were spent lying on the grass with the transmitter delicately poised on my softly rounded lower chest, for with my fading muscle tone this represented another adjustment to reality. The "Floater" was so successful that the "RF-3" was forgotten.

All was well until one evening when a local crop duster returning to the Lodi airport spotted the "Floater" on high. Watching the "action" for a while he remarked that "it sure flew good but it sure didn't look like an airplane should." He was right of course, and my quick was cut. A new reality presented itself and I had to face it. Why couldn't a good soaring type model look like an airplane? I know you'll never guess the answer to that question, and it was some time before the answer struck me. It turned out to be the night a stack of old magazines fell off the shelf and hit me on the back of the neck. Strangely, all of them landed face down except for one, the 1964 Air Progress which lay opened to page 4. I knew it must be a sign.

It was indeed a sign and at long last the "RF-3" became a reality. As presented here it does fulfill the foregoing qualifications of an attractive

An .09 provides ample power. A muffled Cox?



scale model with fine flying qualities. Though an excess of dope brought the weight up to two pounds plus and a wing loading of 14 ounces, (I'm sure you can do better) it has a nice flat glide and is quite capable of thermal hopping. The plans are scale, with the exception of the increased dihedral and enlarged stabilizer, which combine to give a flight pattern as stable as many high wing jobs. As a rudder only design, it is very responsive, using the Adams Dual Actuator on 4.8 volts (4 nicads with 3.6 tapped for the RCVR).

Though the original has an NACA 23015 airfoil, a change was made to a modified semi-symmetrical section with a rounder leading edge, maximum thickness further back and a flattened section on the bottom-rear for easier building. This airfoil has excellent penetration and good stall characteristics. It has relatively low drag on a wing of this size and as a result the plane moves out somewhat faster than expected on only half throttle. An Enya T.V. .09 was used for several reasons: While a hot .049 would be powerful enough, the wide cheeks present a lot of resistance to a small prop, so it was decided to go to the larger engine using an 8/4 Cox prop. As nose weight was needed, the Enya served that purpose better than a lightweight and its throttle lend itself to an easy arrangement for manual adjustment.

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(A wire from the throttle sleeve to an engine mounting bolt, with adjustment made at the set screw on the throttle barrel). It worked just fine for testing at slow speeds and power could be added slowly. Nothing over half throttle has been necessary and there is plenty of climb-out. For a scale flight pattern, even less will do the job. The fuselage space is a bit tight for the inclusion of a motor control unit, so the present arrangement has proven to be a good solution.

At one point I had some doubts about controlling the large span with just rudder, but the torque of the Dual Adams Actuator puts out 3 times the torque of the single. Those of you who have not tried one will be surprised at the amount of "bang" this unit possesses.

A Controaire 5 Receiver with an add-on-switcher and the Controaire Galloping Ghost transmitter complete the package. Although World Engines express doubts about the suitability of its "5" for pulsing, I have had excellent results while using it in a half dozen models, and a wide variety of pulsing speeds.

About the only caution with this design is to limit flying to days and evenings when the wind is under 10 mph. It will fly in wind, but it is a bit of a chore and does not really come into its own under these conditions.

For those of you who like to experiment with someone else's designs, here are a couple of suggestions. Perhaps you can work out a simple spring loaded retractable landing gear. The original folds forward and up between the pilot's feet. To expedite this it would probably be necessary to use plug-in wings so the gear would not have to be detachable. Want to try ailerons — elevators — trim — why not? You take it from here.

**Construction Notes:** The following notes are not a "how to build it" description as it is hopefully assumed this is not your first time around. However, here are a few comments on construction that should be of help as you make big pieces out of all the little ones.

**Wing Assembly:** Some modelers like to build wings and some don't, however it's a major part of the "RF-3," so best to get started early. A look at

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This ship comes into its own in gliding flight.

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the plans will show that it is of typical D tube and capstrip construction. Because of the high aspect ratio, the wing must be built true—no "sort of" here. Select your wood carefully, straight spars are a must. The trailing edges should be quite stiff as they are especially prone to warping. If you possess one of the commercial wing jigs you are in luck—if not—try using trailing edge stock for shims. The rear 40% of the airfoil bottom is flat so it can be pinned to the board if desired. The  $\frac{1}{4}$ " x  $\frac{1}{2}$ " leading edge must also be straight and true. The taper is trimmed to fit after the top and bottom sheeting is in place and dry. Be sure all webbing between the ribs is grained vertically.

The landing gear and wheel must be installed before sheeting the bottom center-section to save you the trouble of chopping it all off and doing it over again. Just a reminder, as not too many wings have one wheel growing from their centers.

Silk was used for covering. If you are hot for MonoKote—give it a whirl.

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The skid plug in tubes can be epoxied on after the wing is covered and held with U-pins. If doping causes tips to washout,  $\frac{1}{8}$ " is ok—anything else must be steamed out. When finished, set all 5'3" of it aside to cure.

**Stabilizer:** Construction should be self explanatory. I used  $\frac{1}{32}$ " sheet balsa for covering, but as tail heaviness is to be avoided, perhaps silk or Silkspan would be preferable. Do not glue the tab to the fuselage or fin. You'll be glad you didn't when it's time for glide trim adjustments.

**Fuselage:** As they say in all these articles, "construction here is straight forward" and so it is. The result is reasonably light yet strong enough to survive the inevitable hard knocks. The only problem child to give you some concern is the molded canopy. A male form must be carefully carved and sealed and a narrower base added so the works can be clamped in a vise leaving the sides clear. .020 acetate was used and it is quite resistant to forming. An oversize piece should be fitted with hardwood strips on each side to facilitate the considerable downward pressure necessary. The kitchen oven did the rather smelly heating job and as it was my first attempt—it took a few tries. Perhaps you know of a better method—if so, be my guest. The effort is worth it however, and an instrument panel and pilot can be included if you feel ambitious.

For the less adventurous, try balsa, foam or what have you. Added equipment space could thus be gained if really needed. The motor mounts will serve for either upright or inverted engine installations, though the tank position must be adjusted accordingly. A one ounce tank size is sufficient to get to altitude, but again the option is yours. Mine is an enclosed "clank" type.

Two methods of actuator installation are shown and both will give more than enough control. Proportional is definitely recommended for smooth flights, because of the short coupled tail.  $\frac{3}{4}$ " throw on each side is plenty—reduce this for escapements.

The Adams units are rugged and extremely reliable, having only one moving part. I've used them for several years and have become an enthusiastic booster. I've seen one control a .19 powered "Falcon 56" in a high wind, so don't confuse them with powder puff magnetic actuators of the past. 'Nuff said.

**Finish:** The original was finished in white and orange with a pale blue pin stripe which didn't photograph. Rubbing compound and wax were used to top off too many coats of dope, so go easy here. Of course if you just want something to look at, pile it on.

**Flying:** The long wing and rather short fuselage create a force arrangement which is sensitive to stabilizer trim, so do some testing over all that

long grass you have let grow in your backyard. Tape the rudder in neutral and check for any turning tendencies. Steam out warps. If launched in a bank, the plane will tend to turn in that direction so don't confuse this with warps.

Early tests should be at reduced throttle settings until all systems are OK. Trim can be for a rather fast penetrating glide, or a borderline stall for thermal sniffing. As mentioned, the rudder is quite responsive so go easy at first. Once in a turn the "RF-3" tends to stay there, so use some top rudder to neutralize. Have a happy summer with yours, and don't catch cold lying on the grass.

## RF-3 SPECIFICATIONS:

Span	36' 9"
Wing Area	118 sq. ft.
Length	19' 8"
Empty weight	484 lbs.
Gross weight	772 lbs.
Takeoff run	462 ft.
Landing run	328 ft.
Cruise speed	105 mph (91 knots)
Stall speed	43 mph (37.3 knots)
Rate of sink as sailplane	3.94 ft./sec.
Glide ratio	18:1
Fuel consump. econ. 56 mph	.77 gal./hr.
Range (105 mph)	315 miles (statute)
Practical ceiling	15,744 ft.
Engine: VW Rectimo	39 hp.