



THE OMEN

DON WILKE'S MAJESTIC 92" CLASS C COMPETITION DESIGN

Omen II is the most successful of a series of Omen's that I have been experimenting with and flying for the last two years. Its clean lines and almost scale-like appearance make it most pleasing, both in the air and on the ground.

After spending almost six months on the initial design and construction of the prototype, the day was finally at hand for the test flight. I chose a Tuesday afternoon in May. The sky was blue with only a few clouds in sight and there was only a slight breeze from the west. It was sunny with a temperature of about 70° – in all respects, a perfect day.

I filled the 16 ounce tank and checked out the Logictrol system – everything was go! I hooked up the glowclip, primed my Merco "61", and flipped it over once. It almost started. On the second flip it let out with a powerful roar. I throttled it back to a smooth purr, taxied out to the strip, and pointed her to the west. I pushed the throttle all the way open, and the Merco let out with its healthy roar. The big Omen started down the strip, gaining speed as it went. When it appeared to have sufficient ground speed, I eased back on the elevator. She lifted off lightly and, ever so slowly, gained altitude in a smooth, scale-like manner. When she had enough altitude, I found that the only trim needed was a touch of up. The transmitter trim took care of this easily, so I went on with the business of checking her out – loops, rolls, Immelmans . . . slow and breathtaking!

Enough for the first flight, I then set up a landing approach much like I had done many times before with the six foot span

foot span airplanes, but I soon found out that this big bird doesn't descend that fast. As she came over the edge of the field, she was still 20 feet high! I throttled up a bit and set up another approach 100 yards farther out. This time, as she came over the edge of the field, she was only six feet up. The Omen settled in for a beautiful landing — first the main gear touched down, then the nose gear followed suit, rolling to a stop. It was then that I noticed that one of the other fliers had arrived on the field. He just stood there with an expression of disbelief at what he had just seen. I flew the Omen two more times that same afternoon, and the poor chap didn't even take his own airplane out of the car. He just stood there and watched.

The Omen is probably one of the largest stunt designs to ever appear in any of the leading modeling magazines. She has a 92 inch overall length with 1200 square inches of wing area, and a flying weight of around ten pounds. This seems like a lot of airplane, but with good reason: Large airplanes fly smoother than small ones because they approach a better situation in regards to the Reynolds Number or Reynolds Effect. I feel that some of the reasons why the large models are currently not flown as often are: first, some of these larger models require a larger engine than the A.M.A. permits in contests. Second, it is more difficult to design a larger model that will do all stunts in the A.M.A. pattern. Third, the five to six foot span models appear to fly smoothly because they are traveling at such a terrific speed. The large models don't need to fly fast in order to appear smooth.

While I used a Logictrol proportional system in the Omen, a good, dependable reed system would undoubtedly give satisfactory results as long as aileron, elevator, rudder, and motor controls are used. Omen I had a Merco .60 and weighed 9 pounds 4 ounces. It is my personal opinion that the larger engines improve performance on the Omen, but don't be afraid to use most any .60 on the market that displays a reasonable amount of power. We have an O.S. Max .80 but haven't had a chance to install it as of this writing. The Enya seems to have a slight edge of power over the Merco, but the Merco has slightly better idling characteristics. The Fox has proven to be a most remarkable engine; although it is quite expensive, it is quite an engine. When you consider that you can cut the fuel 1 to 1 with methanol for this engine, think of the savings on fuel!

The Omen will do the full A.M.A. pattern plus a few stunts not on the A.M.A. agenda! My Omen II is capable of inverted true spins. And although a pattern aircraft, the Omen is quite stable. I have, on countless occasions, flown the Omen to an altitude of 100 yards or more, and handed the transmitter over to beginners who have flown nothing more than high wing trainers. Of course I set the throttle down a bit and cranked in a little up trim; but none-the-less they surprise me by flying it for durations of ten minutes or more and seldom get into trouble.

Before getting into the construction of the model, it might be worthwhile to mention that although beginners have been able to fly the Omen once it is placed in the air, it is not a beginner's airplane — the construction alone dictates this fact. It's a wise move to get a more experienced multi flyer to take the ship up and trim it the first time unless you have had extensive experience flying multi proportional.

Construction

TAIL SURFACES

The stab is built directly over the plans. Use 1/2 inch square medium weight balsa for leading and trailing edges. Make the tips from 1/2 inch soft balsa sheet, and for ribs, use 3/32 inch x 1/2 inch medium soft balsa. After fitting, glue ribs and tips in place, using a glue such as Titebond. Next, make the stab spars using 1/4 inch soft sheet scarf splicing as indicated on the plans. When the stab is completely dry it may be lifted off from the plans and the spars glued into place. Trim the ribs as shown on the plans. The vertical stab and rudder are cut from 3/8 inch soft sheet while the elevators use 1/2 inch soft sheet balsa. Shape and sand all these and set aside for covering.

WING

Start by butting out the ribs, as this is always an arduous task, especially when building tapered wing airplanes where each rib must be cut out separately for a given wing panel. Next cut out the spar doublers (1/4x1/2x14") and glue them to the main spars (3/8"x1/2"x48"). These spar doublers and spars should be medium to medium-hard balsa, and may be glued with Titebond (as well as everything else in the entire wing construction). Laminate ribs 3 and 3a, also 5 to 5a, and set aside to dry. Pin the main spars down over the plans making sure the spar doubler is on the correct side. All ribs may now be glued in their proper station on this main spar.

Prop up the trailing edge of these ribs so that an imaginary center drawn

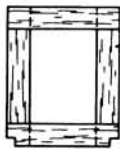
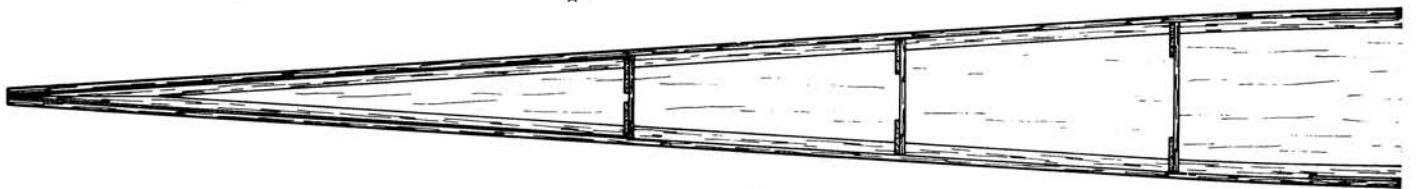
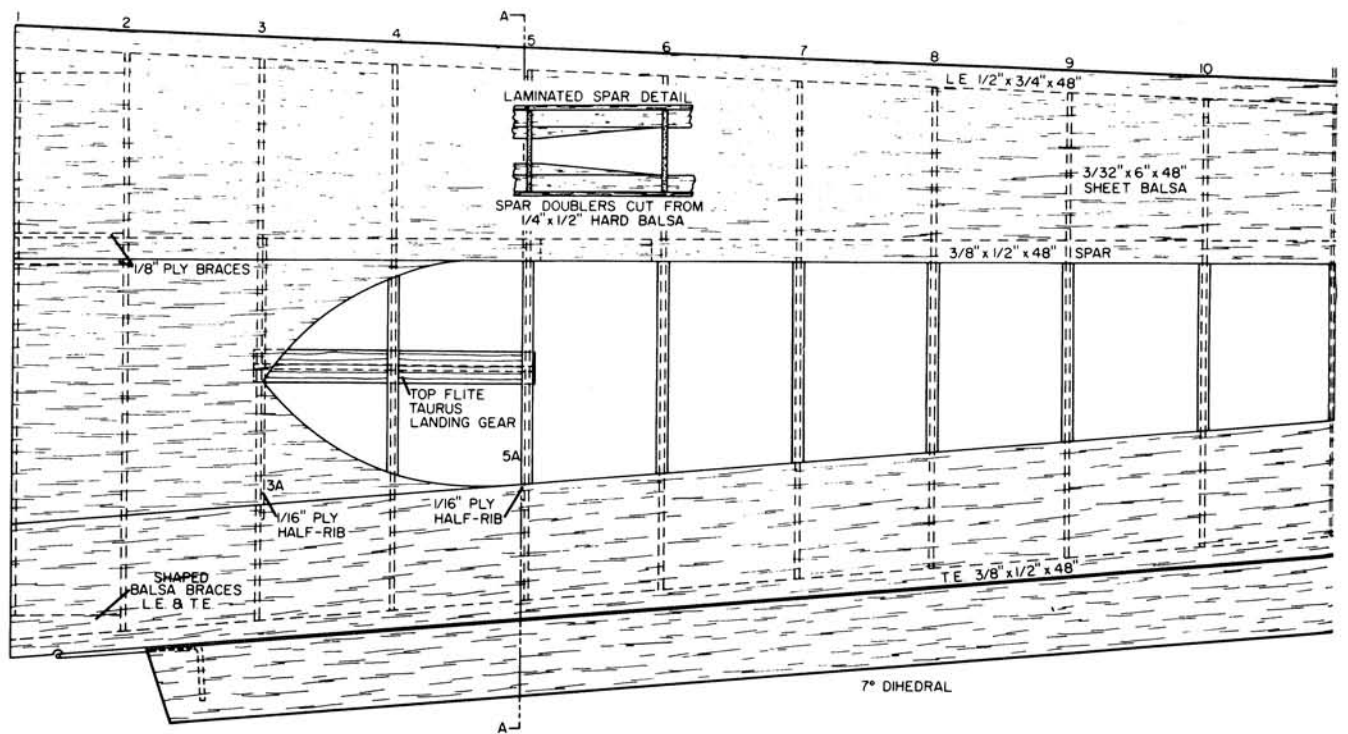
through the ribs would be parallel with your building board. The upper spar may now be glued in place. You may then glue into place the leading and trailing edges which, incidentally, should be medium to medium light weight balsa in order to make shaping easier. The leading edge is 1/2"x3/4"x48", while the trailing edge is 3/8"x1/2"x48". When dry, sand and shape the leading and trailing edges, especially where the ribs meet them. The sheeting can now be installed on the top half only at the leading edge and on the top half of the trailing edge.

All sheeting on the wing should be rather light weight balsa. When dry, the wing panels may be removed from the plans and a Top Flite landing gear can be installed. You may now fit and glue the wing panels together so as to have 7% total dihedral. Plywood dihedral braces may be cut and glued in at the main spar junction, and hard balsa dihedral braces may be fitted and installed at the leading and trailing edge junctions. When dry, glue on the remaining sheeting and capstrips (3/32"x1/4") as well as the wingtips which will both be made from light weight balsa. When dry, shape and sand; then set aside for covering.

FUSELAGE

Start with the splicing of the sides as this is probably one of the most difficult operations in the construction of the fuselage. Unfortunately, balsa doesn't come in five foot lengths, so we must splice two pieces to make each side. I used two three foot pieces, but you could use four footers just as well. Using a sanding block that has a new piece of sharp sandpaper installed on it, carefully sand a bevel on the ends of the pieces to be spliced (1/8"x6"x36" soft balsa). The surface of the bevel should be eight times the thickness of the wood, or one inch. It would be wise to use epoxy on this splice. When the glue is hard, cut out the fuselage sides in such a way that the splice is in the area of the plywood doublers for added protection. You will not have to worry about the strength of such a splice as it turns out to be stronger than the surrounding areas if it is done in a good workman-like manner. You may now cut out the 1/16" plywood and balsa doublers and laminate them in their respective places on the fuselage sides. For a bonding agent I use fiberglass resin. You may also use epoxy or, as Chuck Cunningham suggests, contact cement.

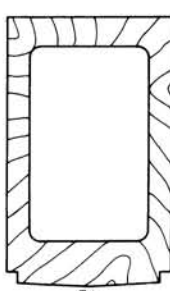
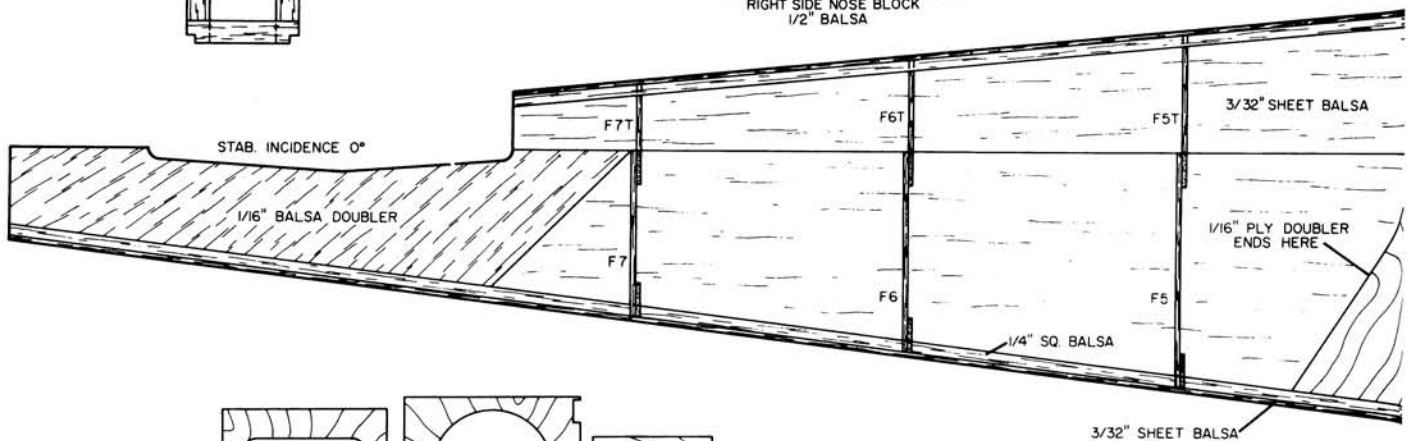
The motor mounts and all bulkheads
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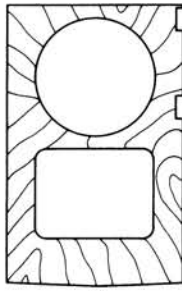
F5, F6, & F7
FRAME TYPE BULKHEADS
3/32" x 3/4" Balsa



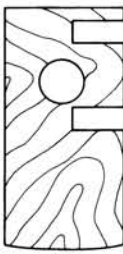
RIGHT SIDE NOSE BLOCK
1/2" Balsa



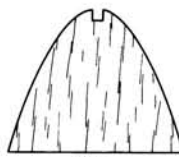
F4



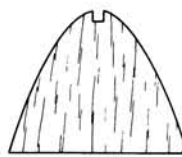
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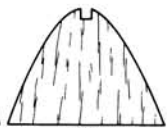
F2



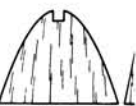
FCT



F4T



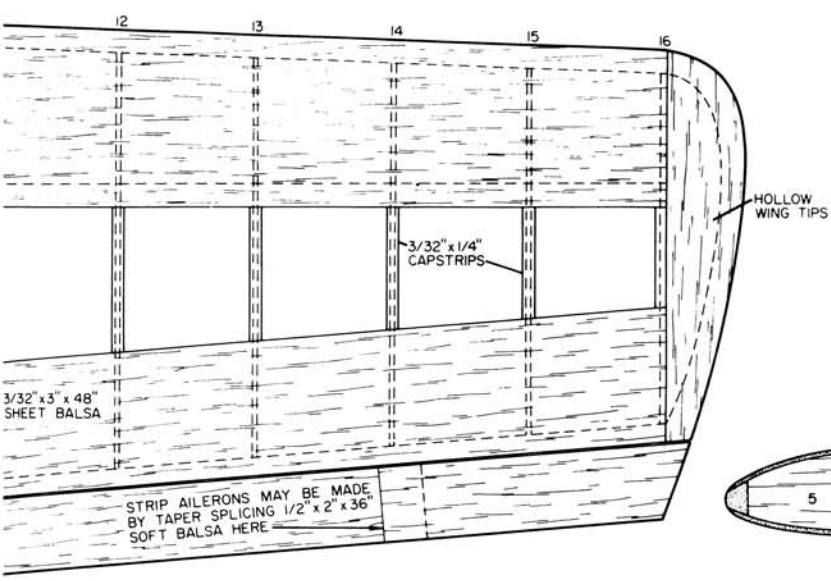
F5T



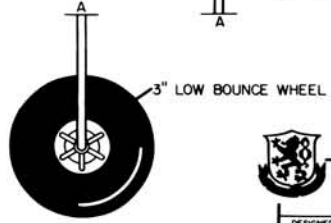
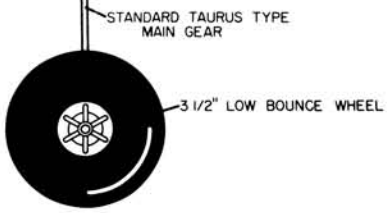
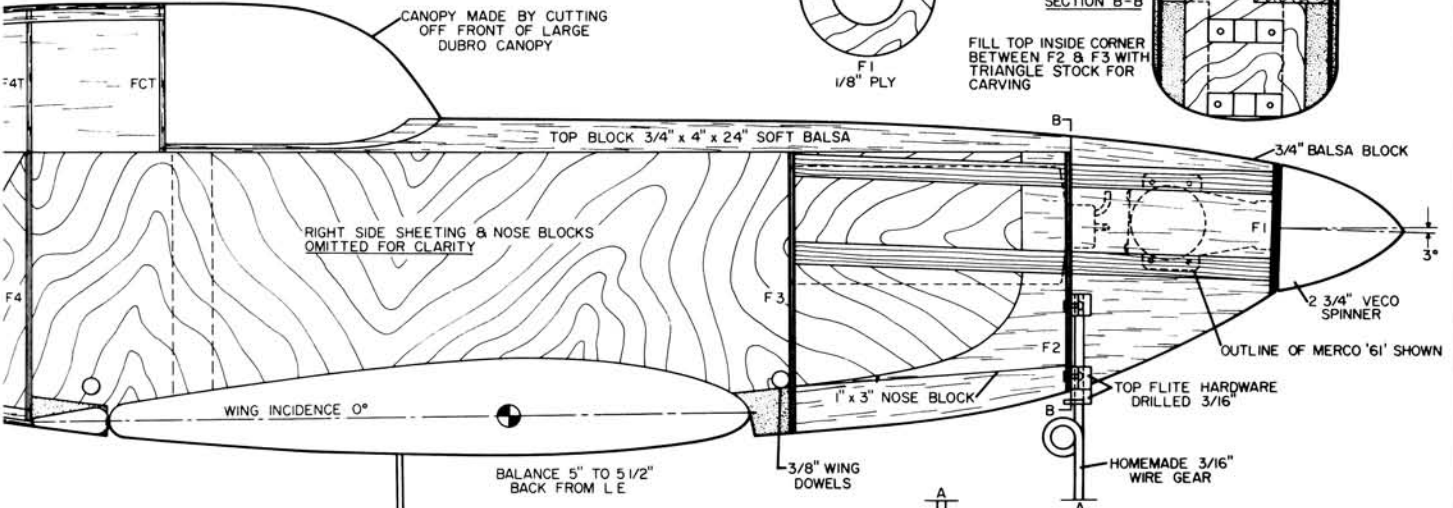
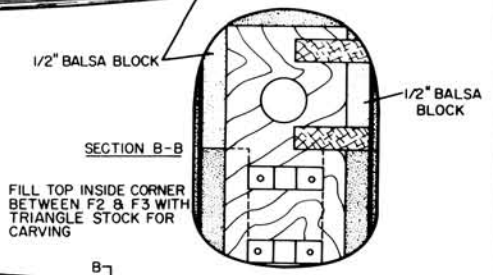
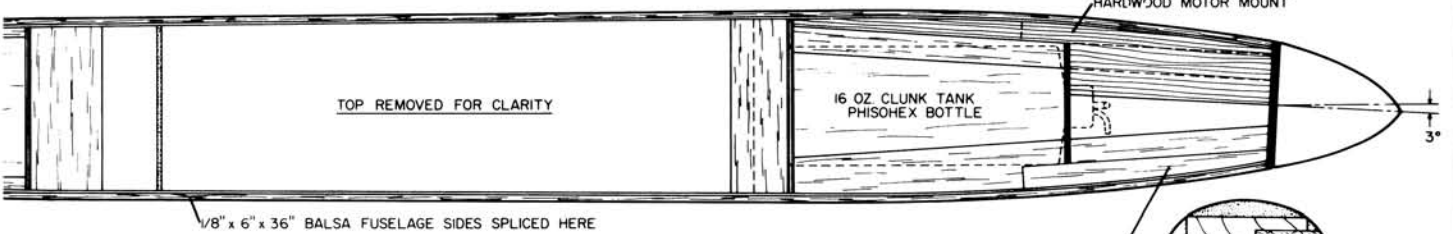
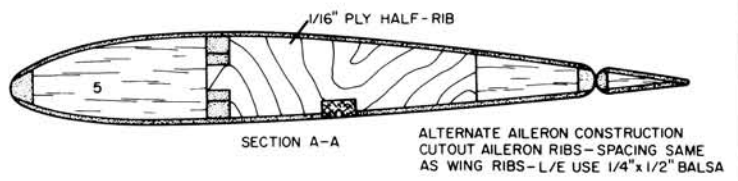
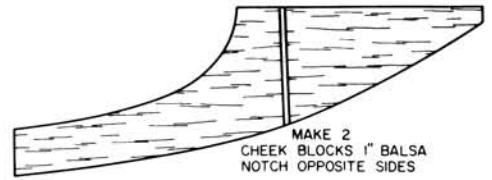
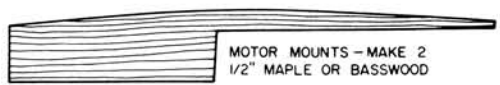
F6T

BULKHEADS 1/8" PLY

BULKHEAD TOPS 3/32" Balsa



RIGHT WING PANEL SHOWN ONLY

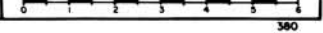


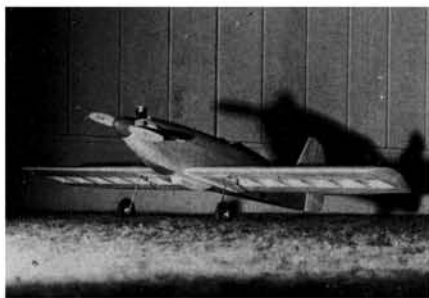
WING SPAN 92"
LENGTH 69"
POWER .60 - 80



OMEN II

DESIGNED & DRAWN BY DON WILKE INKED BY MIKE CROWLEY





THE OMEN

(Continued from Page 29)

may be cut out from the various materials as indicated on the plans. Note that the bulkheads aft of F-4 are to be made up frame-style. This is because of the greater strength-to-weight ratio of this type construction. Use light-weight balsa here. Mustn't let the ship turn out tail heavy, you know! Install the nylon nose gear blocks on F-2 and cut out the nose blocks. Make up a sub-structure of the nose blocks, motor mounts, F-2 and F-3. When the glue is hard on this nose sub-structure, plane and sand to the correct shape, and glue fuse sides to it, making absolutely sure to have the correct amount of downthrust. Install the remaining bulkheads and $\frac{1}{4}$ inch square strips in the aft portion of the fuselage. Sheet the top and bottom of aft portion with light weight balsa. Then fit and glue the top nose block as well as any extra blocks necessary for proper shaping and rounding of the nose area. Cut a hold in the fuselage side where the engine will protrude. Temporarily mount the engine and observe the amount of wood to be ground off in front of the nose to allow F-1 to be fitted in place. Be sure to allow at least $\frac{3}{64}$ " clearance between F-1 and the spinner backplate. When F-1 is glued in place, draw a line around the spinner on this bulkhead. You may now remove the engine and shape and sand the nose area. It is helpful if you have access to a small, hand-held type belt sander for developing the proper shape of the nose area, the rest of the fuselage may be sanded. You will now have a streamlined beauty ready for covering.

I will not enter into a long discussion on covering and finishing. Everyone has their own special methods and favorite materials. I cover with Silron and use Glidair 908X clear C.A.B. dope. When enough dope build-up has been achieved (usually 6 coats or more), wet sand with 400 wet or dry paper. Apply color with

Aero-Gloss spray cans if you can afford it. If not, brush it on. After allowing the color dope to season for about a week, you may rub out the finish with rubbing compound to achieve a beautiful luster.

Getting back to the mounting of the tail surfaces, I don't mount them until everything is covered, doped, and wet sanded, or ready for the color dope. Carefully fit the horizontal and vertical stabs to the tail of the fuse, making sure they are true in reference to the wing. Don't forget the elevator horn before gluing the vertical stab in place. The fillets can be carved from very soft balsa blocks. As soon as they are properly fitted, glue them to blend into the surrounding area and have the proper contour. Whew! It's not as hard as it sounds, really!

FLYING

After carefully checking for correct CG position, surface alignment, warps, and radio operation, you should be set to fly. Be sure your engine is adjusted to run well throughout its entire speed range, especially wide open! When everything seems satisfactory, point your Omen into the breeze, push the throttle all the way open, and when she has sufficient ground speed, a little up elevator should cause her to lift off. Trim the Omen for straight and level flight with the stick in neutral position. The Omen is not a tricky airplane to trim, in fact, the same trimming procedures should be used with the Omen as on any popular Class C airplane.

I'm sure that after flying the Omen for a short time, you will become intoxicated by its graceful, scale-like flight characteristics. Even if the pilot has a bad day, the Omen will make his mistakes gracefully.