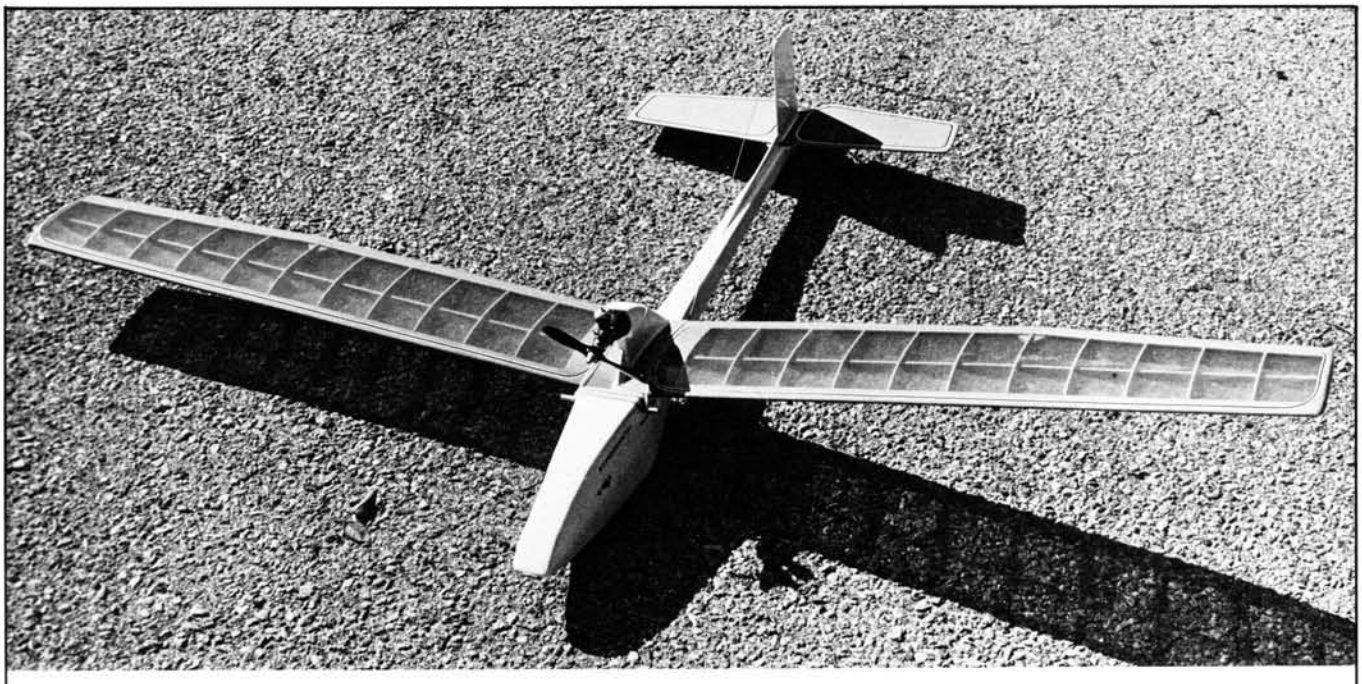
JAVALAERO

By Ted Strader



RCM's Javalaero prototype. Transparent orange MonoKote and opaque white Solarfilm trimmed with DJ's Multi-Stripe. T.D. .020, Ace Commander radio, 12 oz. all-up weight.

The author's prototype on its maiden flight. Ace radio, silkspan covered.

R/C Modeler Magazine is pleased to welcome back to its pages one of RC's most popular writers and designers, Ted Strader, whose monthly columns and construction articles appeared regularly in Flying Models from 1954-1964 and in RCM during the next few years thereafter. Among Ted's most famous designs, and one on which a great many of us cut our teeth during the single channel, superregen days of escapement flying, was the legendary Nomad. Now, after several years away from the hobby due to the pressures of highly classified government sub-contracting, Ted has returned to R/C - - - and to the pages of RCM. We are proud to present Ted Strader's 'Javalaero,' a 48" span, .020 powered sailplane for the Ace Commander pulse system. Weighing in at 11 to 12 ounces, this successor to the Nomad is quick to build, easy to fly, and will provide you with hundreds of hours of relaxed flying pleasure. We predict it will eventually become as popular as its famous predecessor.

Welcome back, Ted . . . .

Ted's chief test pilot, Eric, about to launch prototype Javalaero.

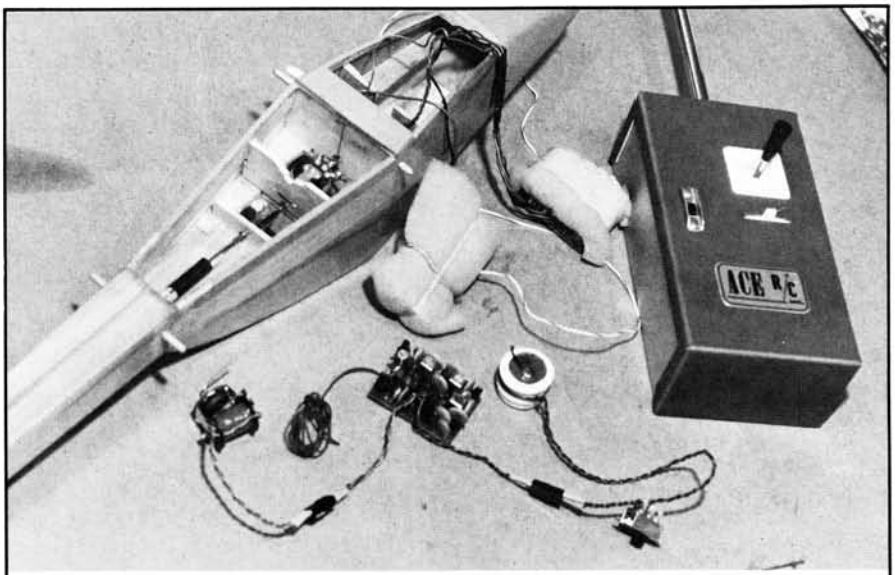
I've heard it said (though I'm certain not by a modeler) that confession is good for the soul . . . or words to that effect. Why this harmless little homily should haunt me is unclear. But it does and I am, therefore, compelled to begin this story by admitting I have never flown this model! The fact that the Javalaero has never felt my hand on the control probably accounts for being able to show you photographs of it after it has completed a full season of flying.

This whole routine began innocently enough. On our way home from the first day's flying this past Spring it occurred to me that my 12 year old son, Eric, had done all of the flying . . . while I had been relegated to a minor role of a running, chasing, panting photographer. It occurred to me because he brought it up to the accompaniment of a wry little smile.

The more I thought of it, the more I became intrigued with a novel way to begin this story. And, because he had guided the Javalaero from its maiden flight through about two dozen successful excursions that day without even a slight scratch, I decided to let him be this ship's only captain. There were residual benefits, of course. Aside from trying to get some different camera angles, I was able to observe every flight without having to worry about controls.

As for camera angles and related trivia: It is impossible to predict how many different shots will be used in this story, however, I submitted pictures taken from Spring to Winter. The static shots (on the hardtop) were taken this past Autumn near the end of the current flying season, as were the launch and at least one in-flight shot. If it's used, one flight shot which appears to be in sequence was actually taken on the first day of flying. The equipment shot close-up was taken after the flying season ended. A time span such as this only serves to point up the fact that the model is capable of weathering a lot of use without looking like a fugitive from a demolition derby. All you need is a good pilot and reliable equipment. Luckily, I have a live-in pilot and the Ace Pulse equipment has worked every time.

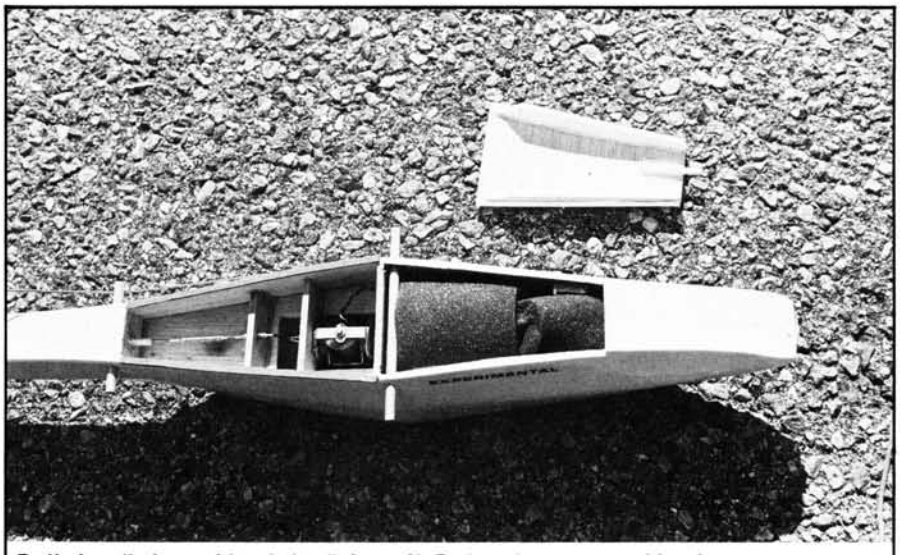
It may or may not be of any



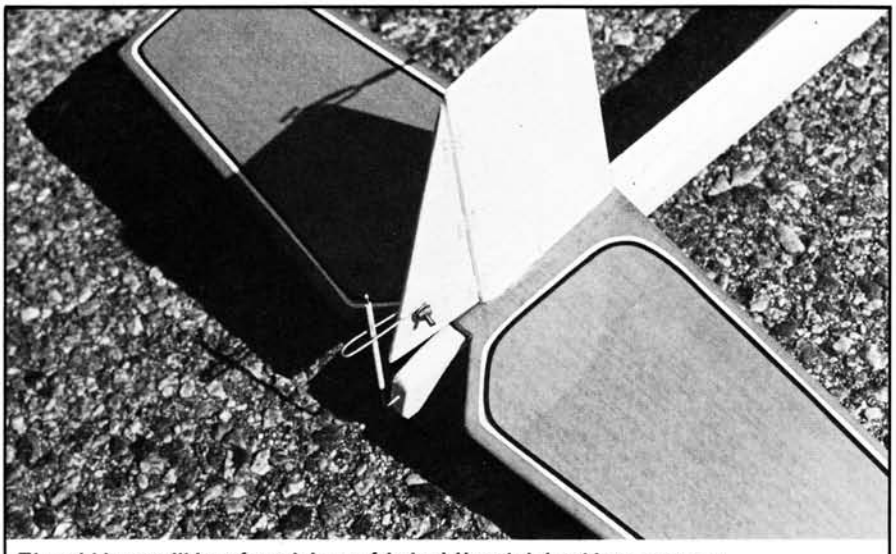
Eric's Javalaero, showing two Ace pulse systems.

interest to you that, though I have never flown the Javalaero shown here, I have flown the fuselage! Bite on that for a moment.

After the first series of flights, we decided to test a new Hollofoam wing and tail assembly. These duplicate the original balsa/paper wings in airfoil and general outline, except that they are constructed of specially prepared sheet foam resulting in a wing which weighs about an ounce less than the original, uses fewer ribs, takes about a quarter of the time to build and, if built flat, will remain warp free indefinitely. I logged two flights in rapid succession. The first was of short duration because the engine was running rough after an afternoon of constant flying and ran just long enough to cover a distance from me to the nearest clump of trees. The second flight was better and the hybrid Javalaero climbed rapidly to its normal operating ceiling which we guesstimate to be between 500 and 700 feet after an average engine run of about a minute and fifteen seconds.



Radio installation and hatch detail. Inner NyRod used as torque rod bearing tube here.



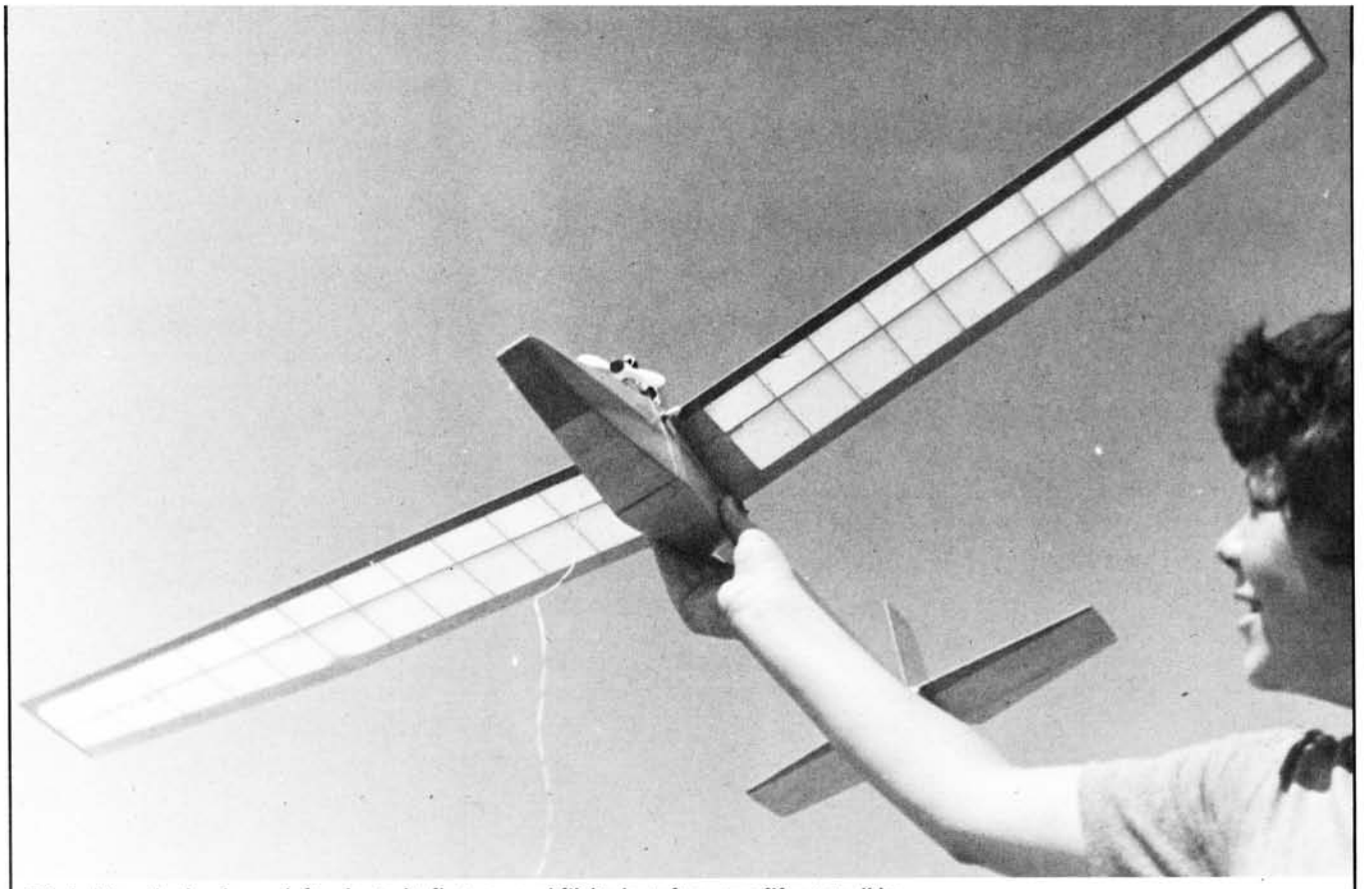
Thread hinges still best for minimum friction! Heatshrink tubing on torque rod arm.

So much for dress rehearsal. Flight three, with the regular pilot back at the controls and me taking pictures, got started under a full head of steam. At about 100 feet the engine began to sputter and it was touch and go for 10 to 15 seconds – just enough time for the ship to get way down wind and awfully close to a heavily wooded area. At precisely the wrong moment, the engine cleared its throat and began screaming with power. Eric tried in vain to swing it around in time but it went behind some trees going full tilt. Tilt is a poor choice of words as it tried to tilt a tall, healthy tree and lost!

Damage was one sheared wing panel which was later repaired in a matter of minutes with 5-Minute epoxy. That same wing panel has since been used on two other glider fuselages and a free flight.

That day's flying generated an entire Summer of experimenting with this material which, when properly applied, can be the answer to a busy modeler's prayer as a time saver and substitute for many construction applications. Because of the fun I've had working with it, I have prepared a story on using foam sheet in conjunction with plans and pictorials describing the construction of a Hollofoam wing and tail assembly for the Javalaero. If you're still speaking to

Cox Tee Dee .020 more than adequate power. Cox Pee Wee .020 less expensive and provides enough to get you up there.



Eric holding the Javalaero aloft prior to its first powered flight, but after some fifty test glides.

me after that, I'll show you how to build a Fomad which is actually a fourth generation Nomad built 90% of this same material.

In the meantime, let's get back to the problems at hand. The Javalaero should present no insurmountable stumbling blocks, even to the newer R/C enthusiasts in our midst. Built in the sequence outlined, and with the application of a reasonable amount of care, sandpaper and cement, you should wind up with a consistent performer. One thing to bear in mind, however, and that is to keep dirt out of your engine and stay away from tall, healthy, unyielding trees – especially downwind!

CONSTRUCTION

Let's begin with the fuselage, the construction of which centers around a main crutch cut from 1/8" sheet. You will notice all lines are straight; therefore, an accurate straightedge will come in handy. Location and careful cutting of the six tabs on either side of the crutch are important. Also note the tab at the very front of the crutch which lines up with the corresponding hole in bulkhead number one.

The 1/16" sheet sides can be of from one to four pieces, depending upon your prowess as a builder. I made each of mine from two which were the piece from No. 1 and No. 3 and the piece from No. 3 back to the tail. Score marks on the front piece allowed for the break along the crutch from No. 1 to No. 3; and vertically at No. 4 accommodated the break at this point. Check the side pieces for alignment with the crutch tabs and break points prior to cementing in place.

The next step is cementing bulkheads No. 3 through No. 7 in position. As they are drying, cement the 1/16" sheet doubler in place in the wing rest area between No. 3 and No. 4. Make certain these are not too long, allowing for the bulkheads against which they touch.

When the bulkheads which have been cemented to the crutch have dried sufficiently to handle, install the sides (the pieces from No. 3 back to the tail) and check alignment. I pinned the crutch on a flat board from No. 4 to the tail. With this much of the aft portion of the fuselage straight and flat, the part between No. 3 and No. 4 almost has to follow true.

Cement the doublers in place on the front sheets, again, allowing for the thicknesses of the bulkheads (2T and 3) they touch. When ready, check for fit and then install. Though I started out with these side pieces in one piece (each) scored along the crutch, I finally succeeded in breaking both of them in half along this score line. They assembled just as easy, so don't come unglued if yours crack there, too. I also drew the sides into shape by using masking tape to hold both sides – top and bottom – tightly against the bulkheads as the cement was drying.

Before you cement the 1/16" sheet top from No. 4 to the tip, install your torque rod or whatever contrivance you plan to use to wiggle the rudder. The plans show a series of concentric points for a wire rod. These are also positioned in such a manner as to be usable if you employ a wooden torque rod as we did on the original. With the torque rod in place and working freely, the tip may now be cemented in place.

The forward portion of the fuselage sides, especially as you progress toward the nose, require sanding to accommodate a good, flat surface to which the 1/8" top and bottom sheeting can be cemented. Some fine sandpaper on a flat block of wood will do this job nicely. Sand from No. 3 toward the nose in a smooth sweeping action and the sandpaper will do the work. The top and bottom sheeting is

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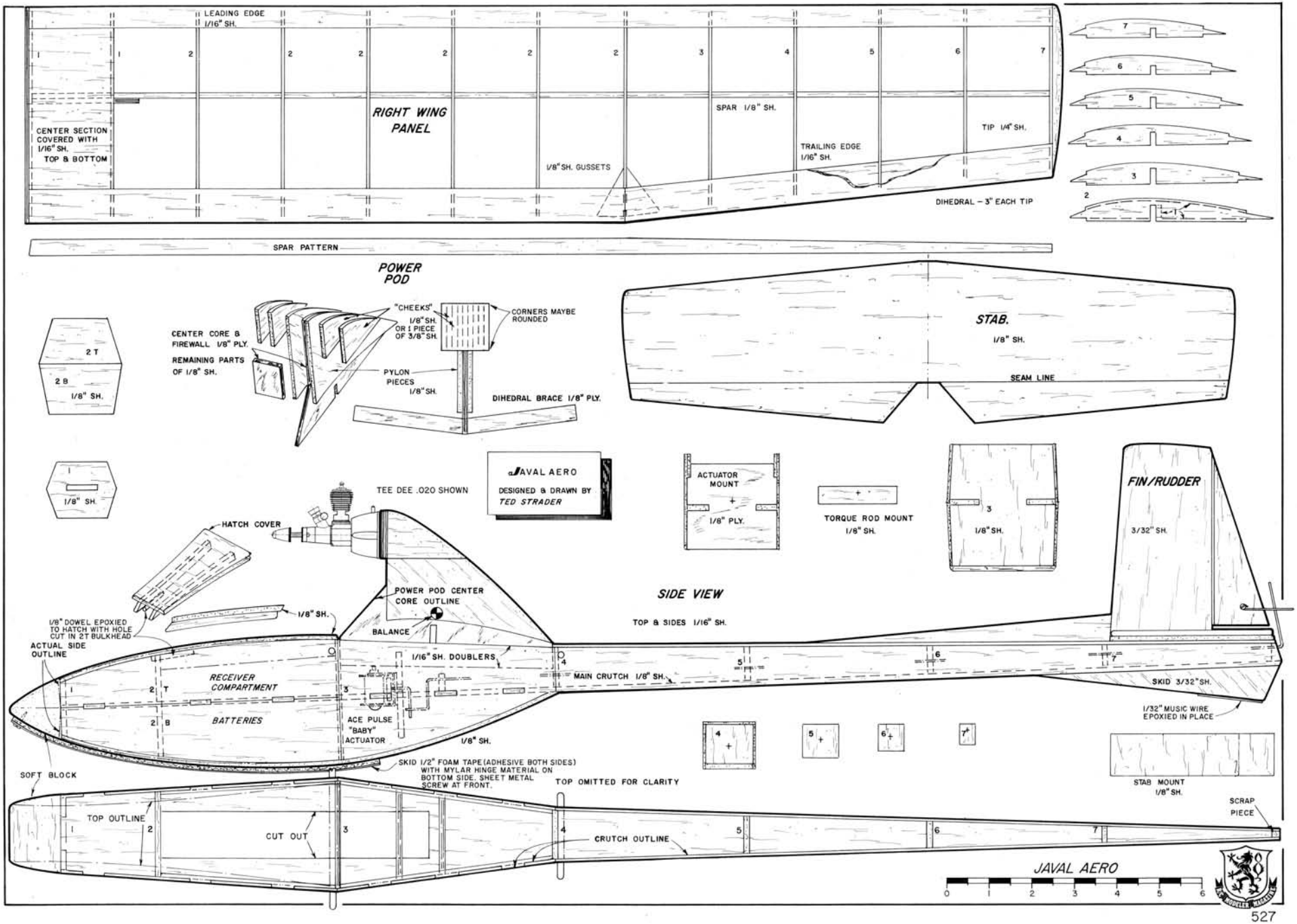
LEADING EDGE 1/16" SH.
RIGHT WING PANEL
CENTER SECTION COVERED WITH 1/16" SH. TOP & BOTTOM
1/8" SH. GUSSETS
SPAR 1/8" SH.
TRAILING EDGE 1/16" SH.
TIP 1/4" SH.
DIHEDRAL – 3" EACH TIP
SPAR PATTERN
POWER POD
CENTER CORE & FIREWALL 1/8" PLY.
REMAINING PARTS OF 1/8" SH.
"CHEEKS" 1/8" SH. OR 1 PIECE OF 3/8" SH.
CORNERS MAYBE ROUNDED
PYLON PIECES 1/8" SH.
DIHEDRAL BRACE 1/8" PLY.
STAB.
1/8" SH.
SEAM LINE
2T
2B
1/8" SH.
JAVAL AERO
DESIGNED & DRAWN BY TED STRADER
TEE DEE .020 SHOWN
ACTUATOR MOUNT
1/8" PLY.
TORQUE ROD MOUNT 1/8" SH.
FIN/RUDDER
3/32" SH.
HATCH COVER
POWER POD CENTER CORE OUTLINE
BALANCE
SIDE VIEW
TOP & SIDES 1/16" SH.
1/8" DOWEL EPOXIED TO HATCH WITH HOLE CUT IN 2T BULKHEAD
ACTUAL SIDE OUTLINE
RECEIVER COMPARTMENT
BATTERIES
ACE PULSE "BABY" ACTUATOR
1/16" SH. DOUBLERS
MAIN CRUTCH 1/8" SH.
SKID 3/32" SH.
1/32" MUSIC WIRE EPOXIED IN PLACE
SKID 1/2" FOAM TAPE (ADHESIVE BOTH SIDES) WITH MYLAR HINGE MATERIAL ON BOTTOM SIDE. SHEET METAL SCREW AT FRONT.
TOP OMITTED FOR CLARITY
SOFT BLOCK
TOP OUTLINE
CUT OUT
CRUTCH OUTLINE
SCRAP PIECE
STAB MOUNT 1/8" SH.
JAVAL AERO
0 1 2 3 4 5 6

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installed cross grain and measurements for each can be roughly arrived at by holding the sheet approximately where it is to be cemented and marking with a pencil. These do not have to be cut with any degree of accuracy as long as they are of sufficient size to cover the space for which they were planned. Later, when the entire area has been covered – top and bottom – some medium sandpaper will smooth them off and blend top, bottom and sides into a good fit. If done with sufficient care, the final sanding operation, using fine paper, will make the assembly look like you planned it that way from the beginning!

The hatch cover is lightly cemented in place along with the rest of the sheeting so it can be sanded with the entire unit. Later, this piece is popped out and backed with a couple of pieces of 1/8" sheet as shown so it will retain its contour. A 1" length of 1/8" diameter dowel can be glued to the bottom of the hatch to key into bulkhead 2T if you so desire.

The tip block of soft balsa is roughly cut to outline, cemented in place and it, too, is sanded with the top and sides so all lines flow together. I found it best to install and sand the block after the top and bottom sheeting had been allowed to thoroughly dry and roughly sanded to shape. This meant the forward section was stronger and better able to withstand the extra pressure which would be exerted while whipping the block into shape.

As you can see from the equipment shot, we are using an Ace Commander Baby Pulse system. I hope it is not confusing . . . seeing what appears to be an excessive amount of equipment hanging out of and along side the Javalaero. Actually these are two separate installations. One is installed with all the foam used and the identical system spread out showing the wiring arrangement. The only difference, actually, between the two is that the system in the plane uses pencell nicads and is two years old. The group spread out uses button nicads and is to be used in our Fomad . . . a Hollofoam version of our old Nomad which will be featured here in RCM in the near future.

The only time consuming task is mounting the actuator on to the plywood bulkhead. Cut a hole to accommodate the shaft flange and position the bulkhead in place prior to permanently attaching the actuator. Once satisfied the position was acceptable, I cemented the bulkhead in place while the acutator just hung there by its shaft. Then, when the bulkhead was dry, I epoxied the actuator flange/plate permanently in place – holding it in position by stuffing some sponge temporarily between it and No. 3. Incidentally, you need a hole about 3/8" in diameter cut in No. 3 so the actuator wires can be run into the receiver compartment. I notice I forgot this on the plans. You may also notice the appearance of a bulkhead just forward of No. 3 in the photograph. This was not included in the plans as all I've succeeded in doing is cutting away at it on the actual plane until its function is now that of a nuisance!

The wings are extremely simple to build, once all the parts have been cut out. Pin the spar down directly over the plans, follow this with the lower half of the leading and trailing edge pieces. Please note that the leading edge pieces are continuous from root to tip; whereas the trailing edge pieces are actually two pieces joined at the break and beefed up with gussets. This ship has seen some hard use and the conventional wing described here has been broken in the center; holes have been poked in it from unscheduled landings in trees, atop shrubs and against other forms of immovable objects; however, these joints have never even shown hairline cracks!

Next, pin the ribs in place, cementing as you go. 1/16" sheet is used – top and bottom – at the center of each section. The dihedral brace can be cemented in place in the first panel you build. Hold off on the top section of sheeting for the time being.

Now the top strips of leading and trailing edge sheet can be cemented in place.

When you're ready to build the other wing half, rub a little light oil on this side of the plans to make the paper translucent enough to see the outline when you turn the paper over. You can even use margarine, but keep it quiet or Mother Nature may snow all over your workbench!

Lay out the parts for the other wing half in the same manner as before, allowing space for the thickness of the dihedral brace along side the spar when you pin down the 1/16" sheeting at the root. Continue construction right through cementing the top leading and trailing edge pieces in place.

At this point, position the almost-finished half in place and see how the two halves line up. If you are ready to join the halves now, it is a good idea to have the power pod center core ready for inclusion. Join the assemblies and block up the one wing panel 6" for the required dihedral. The top sheeting for the pinned-down half can be added now. When this is all dried, the other wing half is pinned down and the remaining top sheeting for that side is cut and cemented in place. The tips, cut from ¼" sheet can be cemented on and sanded when you sand the entire structure.

The pylon pieces and cheeks, all of 1/8" sheet balsa, can be cemented – in sequence – and allowed to dry thoroughly before sanding.

What can I tell you about the stabilizer, fin and rudder? You cut 'em, sand 'em and cement 'em. That is, with the exception of the rudder . . . that requires a nice pliable cloth or thread hinge. Make certain it works freely to eliminate as much parasitic drag on the actuator as possible.

The conventional Javalaero has silkspan on the wings and just clear dope and trim on the wings, fuselage and tail. I usually put on four or five thin coats of clear and a couple of coats of trim on a ship of this size. This has always proven sufficient as my ships usually succumb to the forces of a superior immovable object long before the paint has had an opportunity to wear off. (RCM's prototype used transparent orange MonoKote on the wing and stab, white Solarfilm on the fuselage and vertical fin, and topped off with black and white pinstriping by DJ's Multi Stripe.)

This ship, however, must be living on borrowed time – thanks to the skill of the young pilot pictured. Some day, though, I may just sneak home early from work before the kid is out of school and prepare our hero for its Armageddon!!

Prior to the first powered flight, make certain your model is warp-free and balanced. The spot shown on the plane is as far back as you should balance it. If you find your model balancing farther back than this, shift the equipment forward. If this doesn't quite do the trick, add a little clay to the nose. If your model balances on the spot or a bit forward, you are in luck. It's better to have the ship a bit nose heavy in the beginning.

Find an open spot for your first test glides. If it shows a nice long straight glide in calm air and the glide is repeatable, you may just be ready for powered flight. If you can't call on the services of an eleven or twelve year old to test it, you may just have to do it yourself.

According to my son (. . . I'm serious when I admit I have never flown the all-balsa version), it is really a smooth performer and certainly easy on the nerves. So get busy and knock one out so you'll at least have the fuselage left for the next installment when we describe building the Hollofoam wing and tail.

Good luck and good flying! □