Flown by Don Lowe, the basic Zlin was modified to make the most of the Vegas rules. The design team of Bonnema and Lowe worked out the configuration, Ken building the model—big, graceful, powerful and a dream to fly. Ken Bonnema

THE origin of the Zlin 526 AS as an aerobatic, semi-scale model project dates back to the 1977 Tournament of Champions at Las Vegas. The competitors and spectators at that event were treated to a demonstration of a new breed of model aircraft and a new and unique concept of competition. Ed Keck put his Spinks Akromaster through a series of maneuvers which very accurately represented a full-scale FAI Aerobatics Competition program. With this historic flight, the public had its first introduction to an event dreamed up by Walt Schroder, Bill Bennett, and Jerry Nelson, which came to be known as Vegas Prototype Pattern.

Don Lowe, a judge at TOC '77, came back to Dayton anxious to get started.

OK-WXE

#287

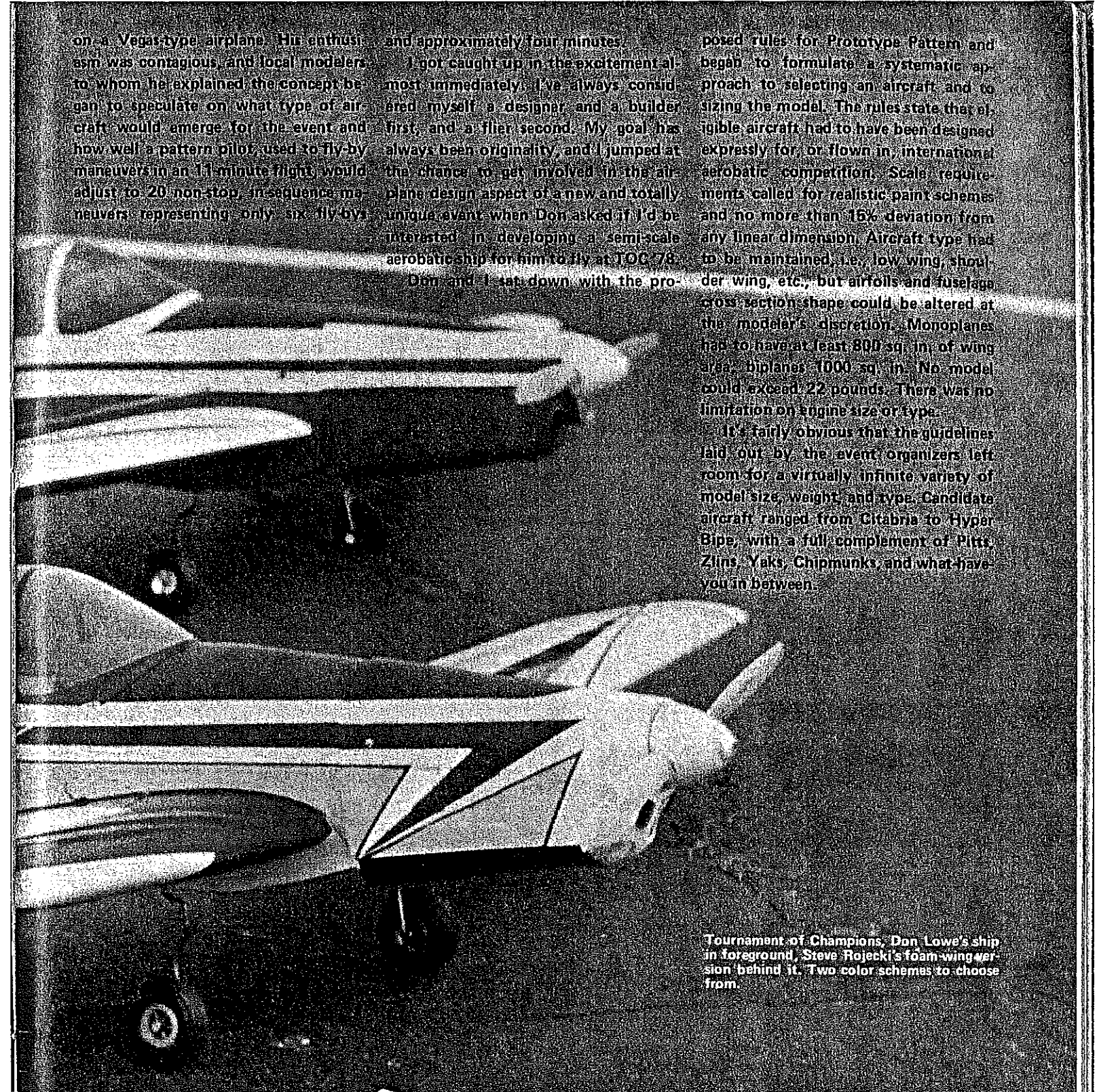
ZLIN

on a Vegas-type airplane. His enthusiasm was contagious and local modelers to whom he explained the concept began to speculate on what type of aircraft would emerge for the event and how well a pattern pilot used to fly-by maneuvers in an 11 minute flight, would adjust to 20 non-stop, in-sequence maneuvers representing only six fly-bys and approximately four minutes.

I got caught up in the excitement almost immediately. I've always considered myself a designer and a builder first, and a flier second. My goal has always been originality, and I jumped at the chance to get involved in the airplane design aspect of a new and totally unique event when Don asked if I'd be interested in developing a semi-scale aerobatic ship for him to fly at TOC '78.

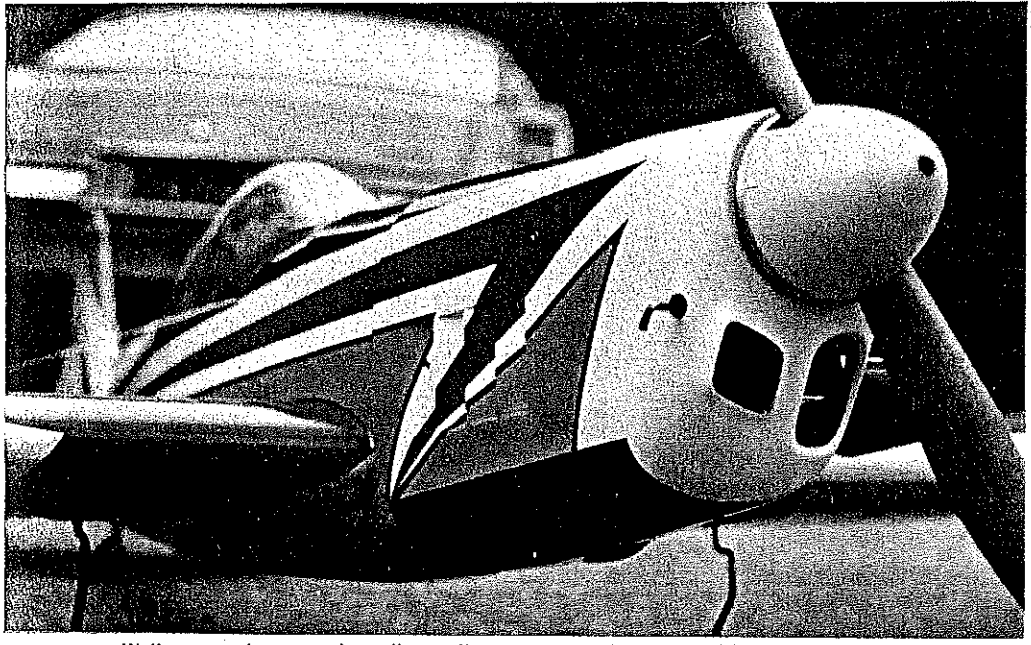
Don and I sat down with the proposed rules for Prototype Pattern and began to formulate a systematic approach to selecting an aircraft and to sizing the model. The rules state that eligible aircraft had to have been designed expressly for, or flown in, international aerobatic competition. Scale requirements called for realistic paint schemes and no more than 15% deviation from any linear dimension. Aircraft type had to be maintained, i.e., low wing, shoulder wing, etc., but airfoils and fuselage cross section shape could be altered at the modeler's discretion. Monoplanes had to have at least 800 sq. in. of wing area; biplanes 1000 sq. in. No model could exceed 22 pounds. There was no limitation on engine size or type.

It's fairly obvious that the guidelines laid out by the event organizers left room for a virtually infinite variety of model size, weight and type. Candidate aircraft ranged from Citabria to Hyper Bipe, with a full complement of Pitts, Zlins, Yaks, Chipmunks, and what-have-you in between.

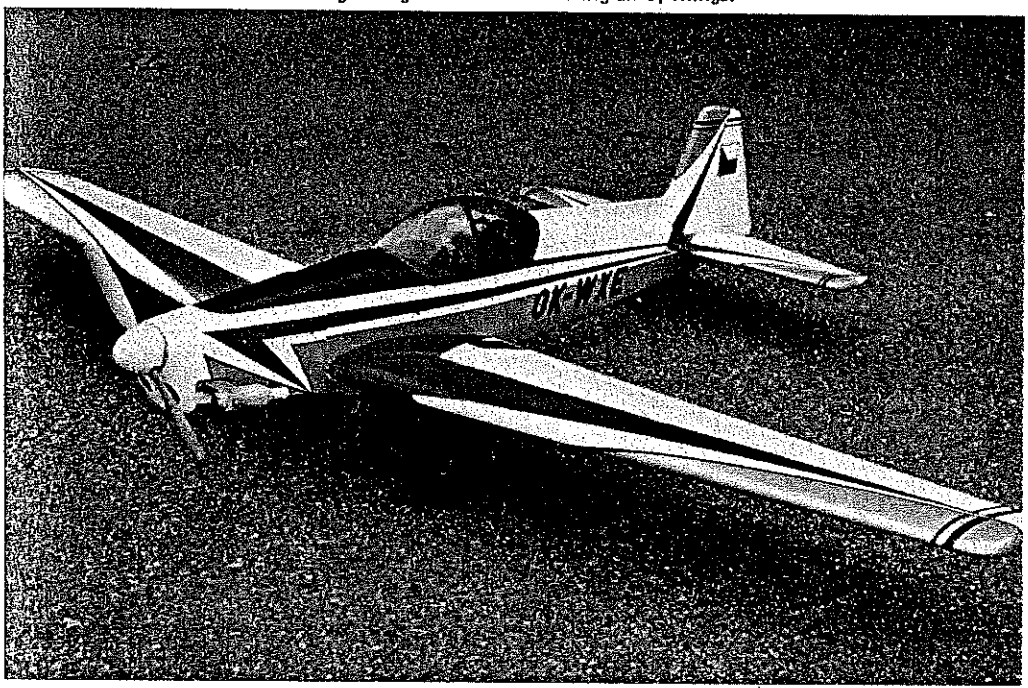


Tournament of Champions, Don Lowe's ship in foreground, Steve Rojecki's foam-wing version behind it. Two color schemes to choose from.

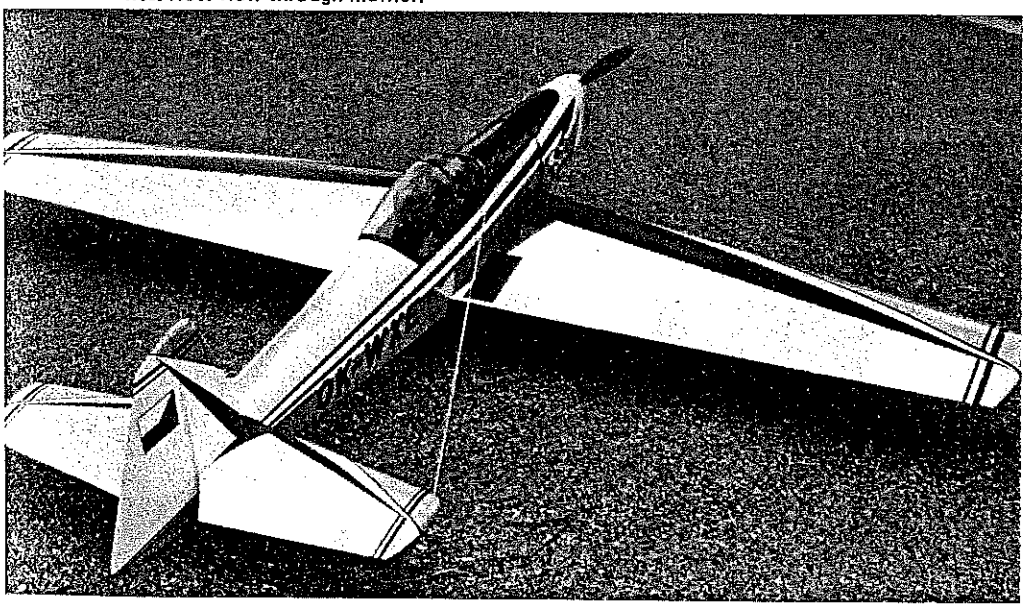
526AS

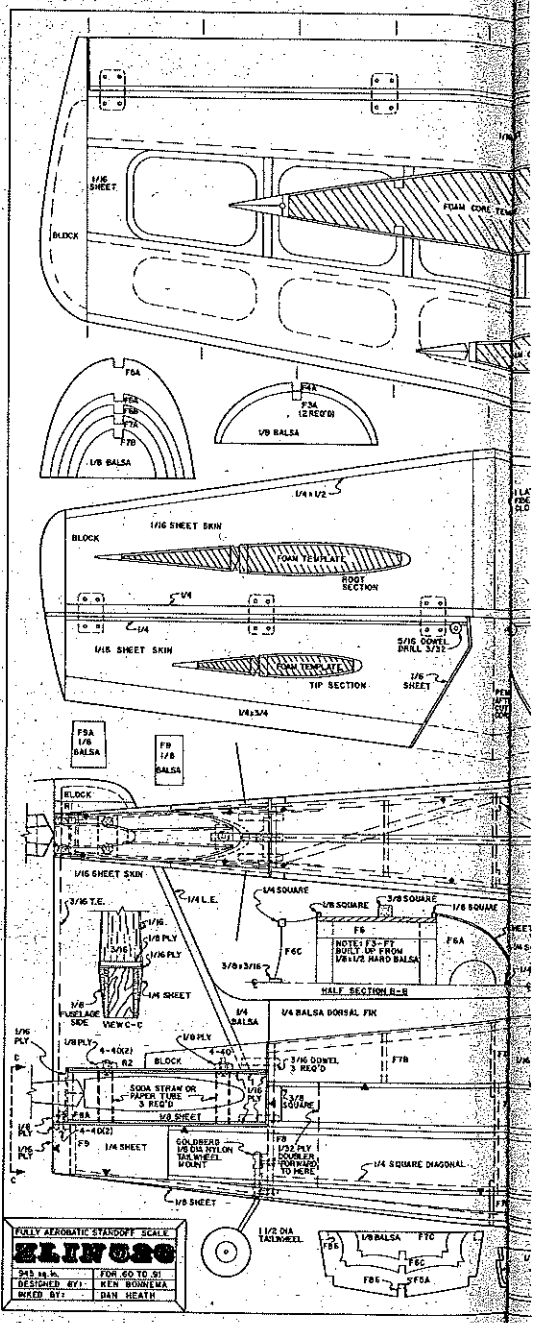


Well-executed nose and cowling really mean so much. Details of fiberglass cowl show up well in this shot—note handling of edges around the cooling air openings.



Just another picture to provide another eyeview of the color scheme. Pilot is Charlie Brown, no less. Note flow-through muffler.



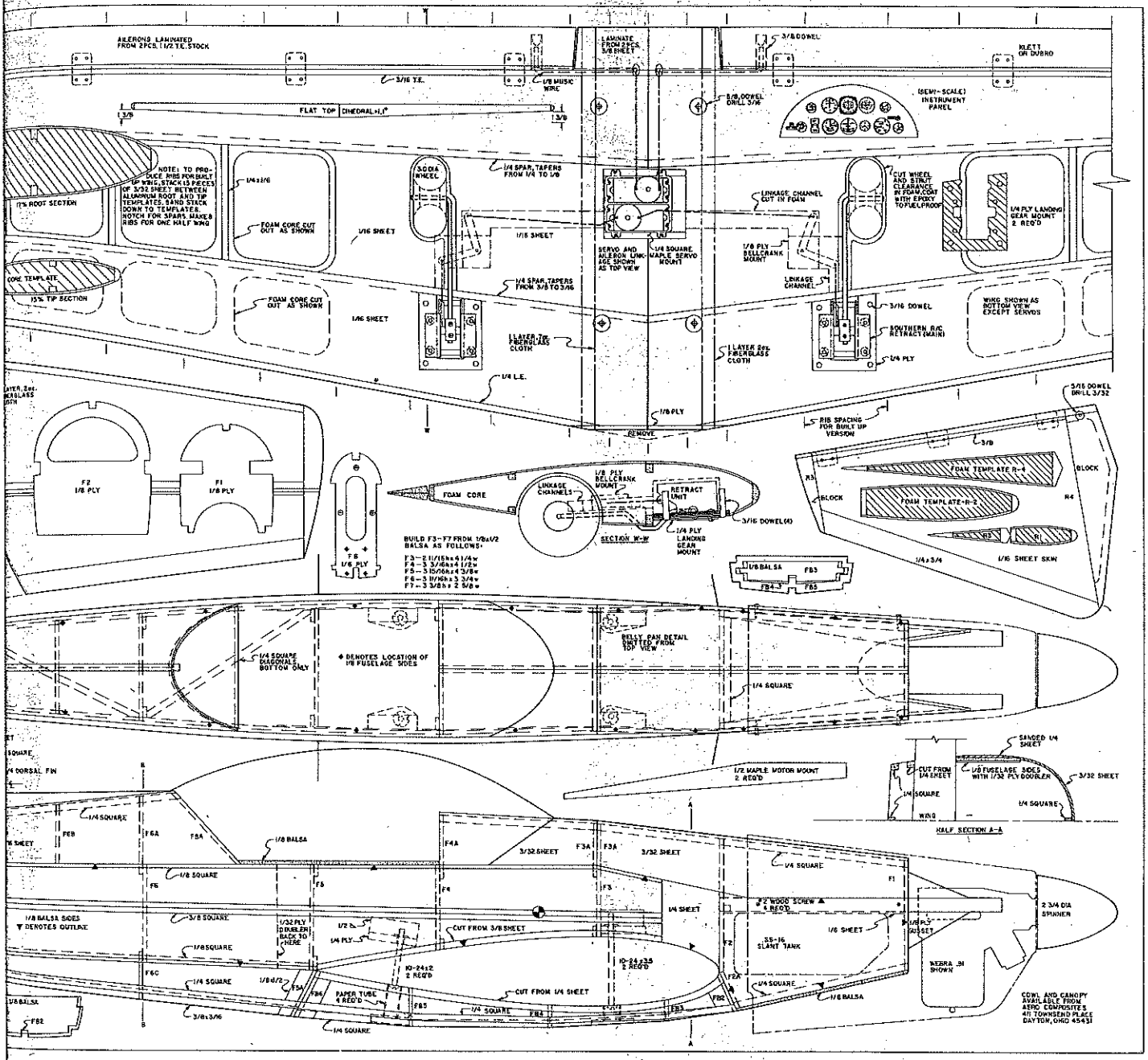


Naturally enough, Don felt we should seek an aircraft similar in layout to his Phoenix. The Zlin 526 and 726 series offered a variety of designs somewhat like a Phoenix in that they were low-wing, long-tail moment vehicles with slightly swept wings. Just finding a full-scale aerobatic bird with lines along those of a successful model design was not going to be enough, however, to arrive at a winning design for a totally new event, one purpose of which was to avoid model flying characteristics and stress scale realism.

We decided to go large and light. Large to add realism of presentation and ease of attitude recognition by pilot and judge. Also large to add drag for slower flight; again for realism and also to help keep the airplane in the 120° box in which all maneuvers had to be performed. Light weight was considered essential for vertical performance and for minimizing wing loading which would allow sharp square corners without flaps. Another advantage of light weight in aerobatic aircraft

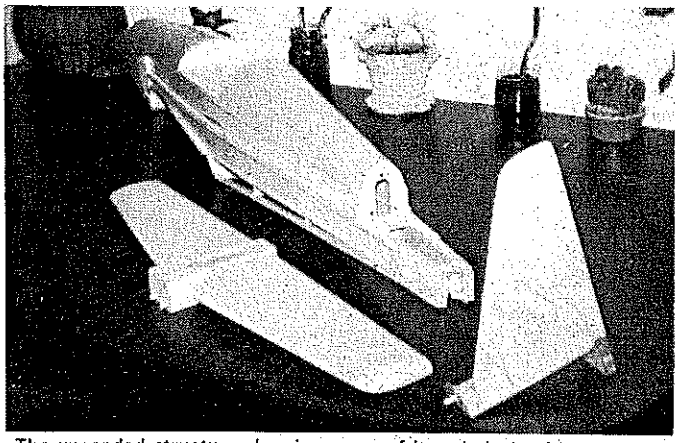
Seen from the rear the color-scheme lines do emphasize a feeling of forward motion. The antenna is strung to the stabilizer tip.

FULL SIZE PLANS AVAILABLE . SEE PAGE 128

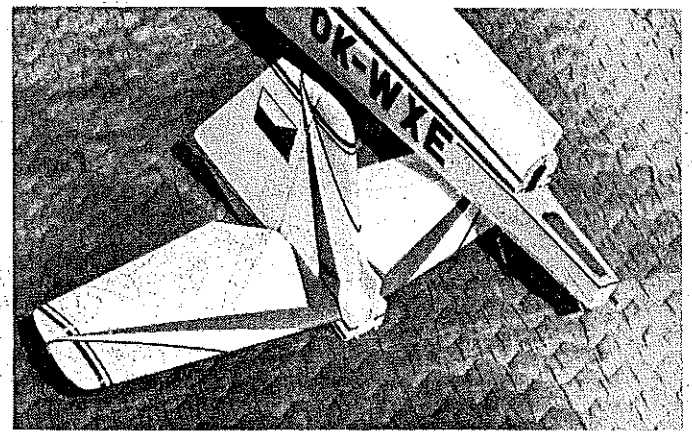


which is often overlooked is the reduction of angular moments of inertia.

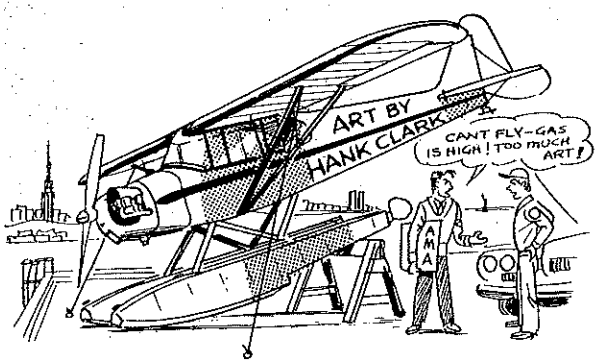
An angular moment of inertia is a mass property of an aircraft which opposes its rotation about either its yaw, pitch, or roll axis. The same inertia property also opposes the cessation of rotation of an airplane that is already rotating. In other words, an airplane with a high angular moment of inertia in roll is hard to start rolling and difficult to stop rolling once it starts. These characteristics are exactly what you don't want in an event where precision point rolls and snap rolls are required in more than ⅔ of the maneuvers. By keeping structural weight to an absolute minimum, we could reduce all the moments of

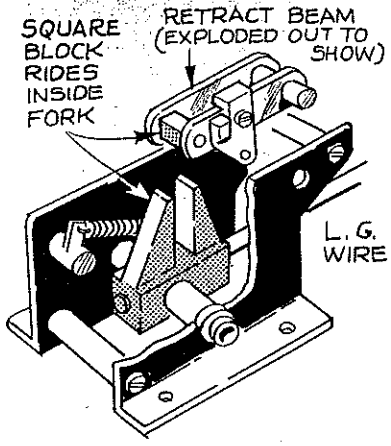


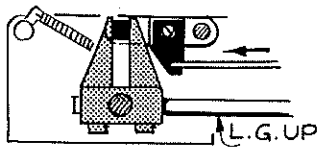
The unsanded structure showing some of its relatively simple details, and how the complete tail detaches in two separate pieces.

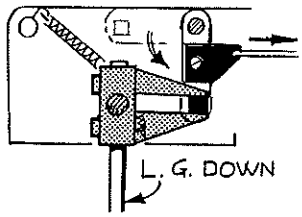


The vertical fin may be separated from the stabilizer and reattached to the fuselage with one dowel and two screws. Facilitates transport.









AEROCOMPOSITE CANOPY

ALTERNATE WING CONSTRUCTION IS 3/32" BALSA RIBS WITH SAME SPARS – LEADING, TRAILING EDGES

RUDDER & ELEVATOR NYRODS TO SERVOS

3/32" SHEET FRONT DECKING

TEE NUT IN BLOCKS FOR WING MOUNT SCREWS

3/8" BALSA MIDDLE FAIRLEAD BACK TO TAIL

1/4" SHEET

FOUR NO. 2 SCREWS SECURE COWLING TO FUSELAGE

1/8" PLYWOOD GUSSETS TOP AND BOTTOM

WEBRA 91 ENGINE

2 3/4" DIA. SPINNER

AEROCOMPOSITES COWLING SCALE TO FIT

1/2" MAPLE ENGINE MOUNT REACHES TO F-2 (2)

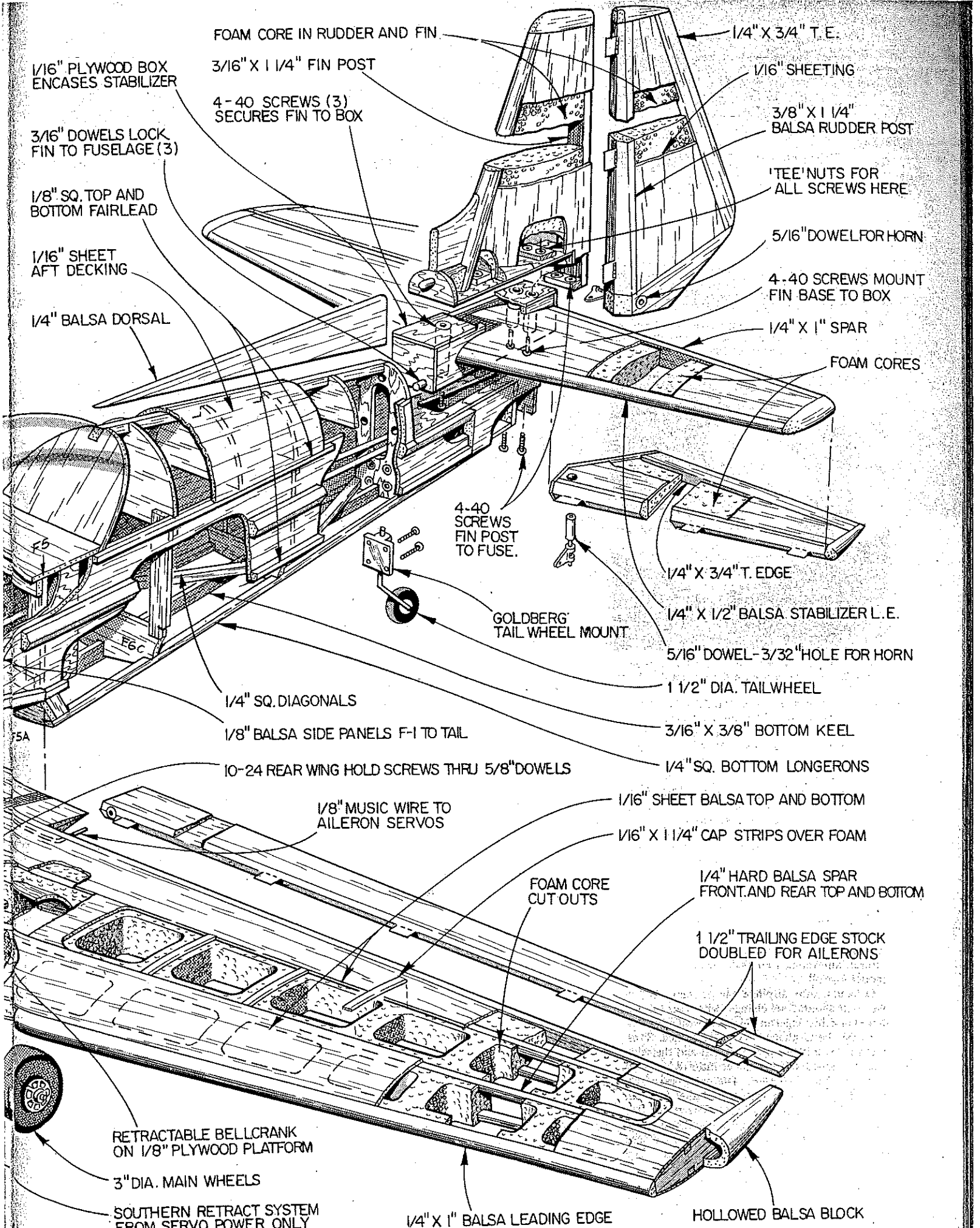
TUNNELS CUT FOR L. G. RETRACTING SERVO RODS

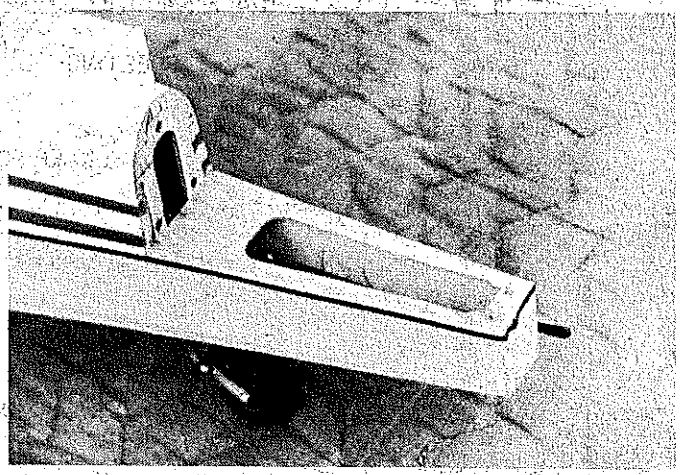
1/32" PLYWOOD FUSELAGE DOUBLER FROM F-1 TO F-5

BELLY PAN IS CEMENTED TO BOTTOM OF WING FIRST

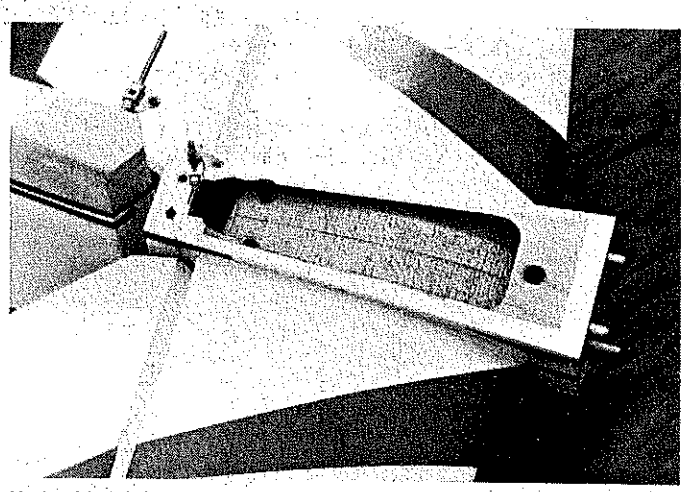
10-24 SCREWS TO SECURE WING THRU 5/8" DOWELS

3/16" DOWELS IMBED INTO FOAM TO ANCHOR L. G. 1/4" PLYWOOD PLATFORM

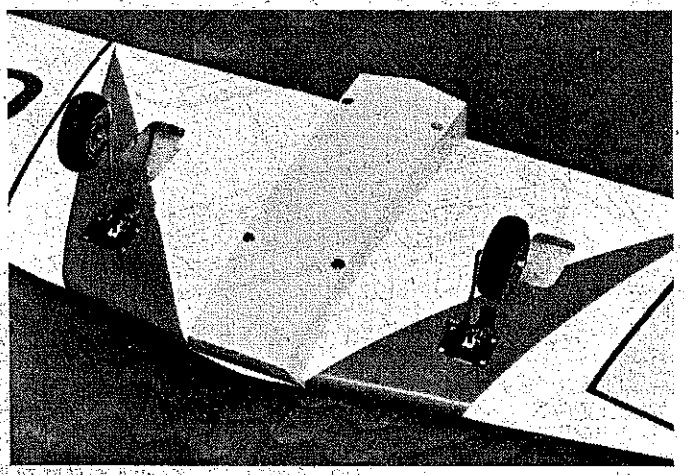

FOAM CORE IN RUDDER AND FIN
3/16" X 1 1/4" FIN POST
4-40 SCREWS (3) SECURES FIN TO BOX
1/16" PLYWOOD BOX ENCASES STABILIZER
3/16" DOWELS LOCK FIN TO FUSELAGE (3)
1/8" SQ. TOP AND BOTTOM FAIRLEAD
1/16" SHEET AFT DECKING
1/4" BALSA DORSAL
1/4" X 3/4" T. E.
1/16" SHEETING
3/8" X 1 1/4" BALSA RUDDER POST
'TEE' NUTS FOR ALL SCREWS HERE
5/16" DOWEL FOR HORN
4-40 SCREWS MOUNT FIN BASE TO BOX
1/4" X 1" SPAR
FOAM CORES
4-40 SCREWS FIN POST TO FUSE.
1/4" X 3/4" T. EDGE
GOLDBERG TAIL WHEEL MOUNT
1/4" X 1/2" BALSA STABILIZER L.E.
5/16" DOWEL-3/32" HOLE FOR HORN
1 1/2" DIA. TAILWHEEL
1/4" SQ. DIAGONALS
1/8" BALSA SIDE PANELS F-1 TO TAIL
3/16" X 3/8" BOTTOM KEEL
1/4" SQ. BOTTOM LONGERONS
10-24 REAR WING HOLD SCREWS THRU 5/8" DOWELS
1/8" MUSIC WIRE TO AILERON SERVOS
1/16" SHEET BALSA TOP AND BOTTOM
1/16" X 1 1/4" CAP STRIPS OVER FOAM
FOAM CORE CUT OUTS
1/4" HARD BALSA SPAR FRONT AND REAR TOP AND BOTTOM
1 1/2" TRAILING EDGE STOCK DOUBLED FOR AILERONS
RETRACTABLE BELLCRANK ON 1/8" PLYWOOD PLATFORM
3" DIA. MAIN WHEELS
SOUTHERN RETRACT SYSTEM FROM SERVO POWER ONLY
1/4" X 1" BALSA LEADING EDGE
HOLLOWED BALSA BLOCK



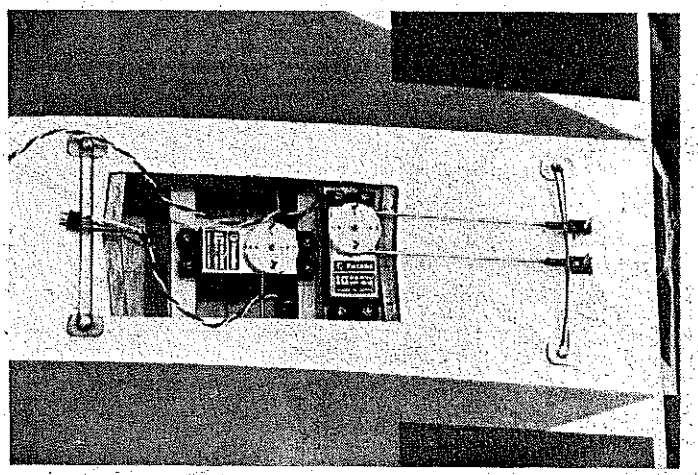
Aft fuselage detail showing dowel holes and screws for attaching tail section. Rudder pushrod attaches internally to tail-wheel arm for steering. Larger size models permit flexibility in structural design.



Underside of detachable tail. Three large holes provide access to the screws which attach fin to stabilizer. Two holes at rear are for screws which attach entire unit to the fuselage.



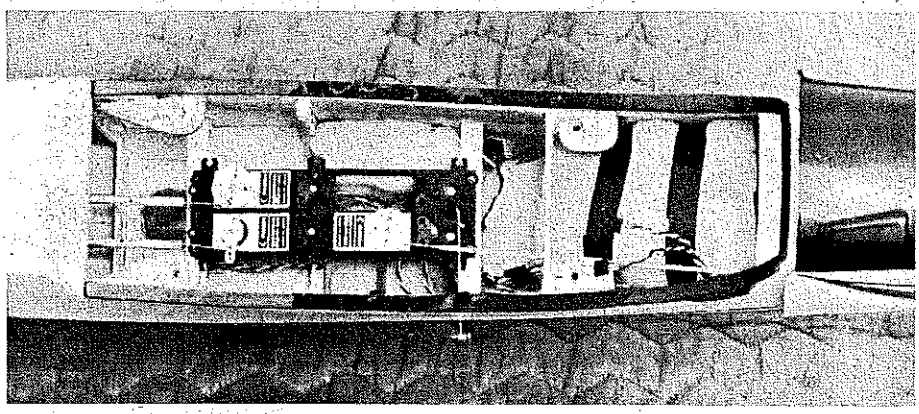
Using Southern RC retracts—with Fox wheels—gear swings aft rather than sideways, to duplicate the retractable function of real craft.



Servo installation in the wing, aileron servo at the rear, retract servo forward. Bands only hold screws in place.

inertia and insure crisp, totally controllable rotations of the aircraft about all its axes.

We finally settled on the Zlin 526 AS as the basis for this project. The 526 AS is a single-place aerobatic low wing with a faired-in canopy and an in-line engine. The wing is fairly high aspect ratio which implies good roll damping. The leading edge is swept with a straight trailing edge resulting in a wing sweep of about 4 degrees. Thrust line, wing, and horizontal tail are not separated vertically very much, which usually means control coupling is less likely. Vertical tail size was large enough to scale directly. The horizontal tail size was increased in span and chord the maximum allowable 15%. The scale engine cowl allowed a very neat inverted installation of the Webra .91 chosen for power. Finally, the retractable landing gear of the real aircraft allowed us to include this feature in the model as well.

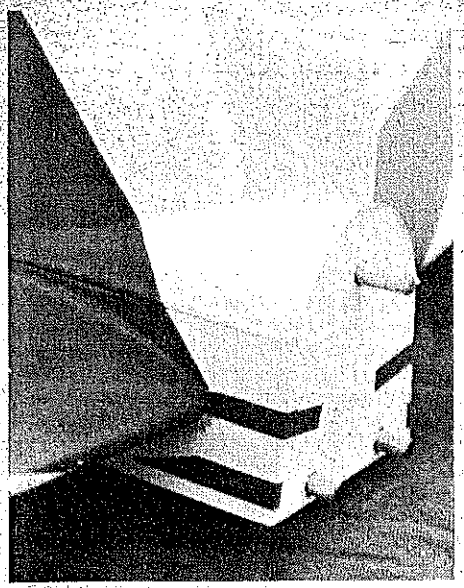


The fuselage equipment bay dwarfs the servo tray. The receiver is forward with batteries located under the servo tray. Note that the pushrods are aluminum tubing.

Of course, any airplane can be improved, so we made some subtle changes within the rules in hopes of achieving a model which would fly considerably better than a true scale replica. Symmetrical airfoils were substituted and the wing was shortened and its aspect ratio reduced by widening the tip chord. The wing was also moved forward one inch to lengthen the tail moment and improve balance. The thrust line and horizontal tail were lowered while the wing was raised slightly in order to bring all surfaces more nearly in line with the thrust vector. The width of the fuselage was reduced 15%, and the canopy was moved forward an inch to help knife-edge flight. Strip ailerons were substituted for the full-size aircraft's conventional ones, and the horizontal tail was increased in chord and span to improve tail volume coefficient. All other aspects of the aircraft are true scale or very close to it, including fuselage cross section.

The aircraft was sized at 950 sq. in., well over the minimum, but quite a bit smaller than some of the other airplanes that turned up at Vegas. The weight goal was set at 9 pounds, which if achieved would result in excellent vertical performance from the Webra .91. The first version had a built-up wing and vertical fin. A second 526 AS was built by Steve Rojecki with a foam wing cut out to resemble a rib structure. He added balsa spars and sheeting and wound up with an open framework foam wing closely resembling the built-up version. Both airplanes were MonoKote and Solar Film covered. Epoxy-painted fiberglass cowls and custom molded canopies were added to complete the vehicles, which both weighed in at 8½ pounds ready to fly minus fuel.

Initial flights of both aircraft were very encouraging. It was obvious that the efforts to achieve low angular inertia and minimum weight had paid off. Square corners were sharp and clean. The precise starting and stopping of rolling maneuvers had been successfullly accomplished. The airplane was not at all fast, but it had the highly desirable quality of flying at a nearly constant speed. The high drag of the large airframe slowed it down in dives and the engine pulled it vertically with little sag due to its low



Detachable tail detail: Shown are the alignment dowels and the parting line between the vertical fin and the horizontal tail.

Ken Bonnema displays the bottom of the ship so we can admire its color scheme—bit wild, what?

weight. The reliability of inside and outside snapping maneuvers was improved by moving the center of gravity back to its current location as shown on the plans. The snaps are also enhanced by the wing itself with an airfoil that gets thinner toward the tip and a leading edge that sharpens outboard.

Both airplanes were flown in the 1978 Tournament of Champions in the new Prototype Pattern. The original built by the author was flown to a 14th place finish by Don Lowe. The other built by Steve Rojecki, was flown by Steve in his capacity as pattern demonstration flier. Steve was not a competitor, but he flew the full pattern before the judges during their training and at the beginning of each round of official flying. The idea was to establish a base flight for the judges, rather than have them react differently to the first few flights of any round. Steve probably got the assignment not only for his proven flying abilities, but also because he was a rare individual who was not an invited competitor, but did have a qualified airplane for the event.

As is the case with many new events, the rules for Vegas Prototype Pattern were provisional and subject to change and improvement based on the success of the first event. The rules were changed for 1980, and the Zlin 526 AS as presented here is no longer eligible for Vegas. It is too small now that the minimum size for a monoplane has been increased to 1100 sq. in., but since Vegas is an invitational event limited to about 25 select competitors, it is unlikely that many, if any, would have been built for that purpose. The Zlin 526 AS remains an attractive model for stand-off scale events with a .60, and with a .91 it offers the exciting bonus of full aerobatic capability.

Construction

It's always best to tackle the toughest building chore first. Normally that means the wing, but in this case the fuselage rates first attention. The fuselage is complicated by its simulation of the real airplane's fabric covered longeron structure and by its provisions for a removable tail section. The tail separates from the fuselage to make transporting the airplane easier. The vertical fin then may be attached to the fuselage without the horizontal installed, if for some reason you wanted to transport the fuselage intact, but without elevator halves sticking out. If you happen to have an ample vehicle like a van or station wagon, and you don't plan to ship your airplane to Nevada every year or so, I recommend you build permanent fixed tail surfaces. This not only reduces complexity, but saves weight by eliminating a lot of plywood.

To get started on the fuselage, bulkheads F1 and F2, the two motor mounts, a ¼ sq. cross brace, and the 1/16 floor between bulkheads F1 and F2 are assembled into a unit using slow setting epoxy. Bulkheads F3 through F7 are built up from ⅛ by ½ balsa with overlapping corner joints. Add doublers and then join the fuselage halves and bulkheads F3 through F7 with the fuselage upside down on a flat building board and aligned with the top view of the plans. Add bulkheads F8 and F9 after removing the fuselage from the board. Before adding the forward bulkhead unit with epoxy, be aware that the fuselage sides will form an hour glass top view when this unit is added. It looks strange, and it requires some good clamping and possibly wetting the sides to accomplish, but it is required in order to fair the longeron-type aft fuselage structure into the smooth-sided nose structure.

Editor's Note: We consider this "Zlin" to be a super aircraft for the skilled pilot who wants something a bit different (special), both in the personal ship he flies and for the highly realistic maneuvers he can perform with it. It took a little doing to bring all this together. Don Lowe, of the many Phoenix Marks, is not given to dashing off magazine projects. And it developed that the design was worked out by Ken and Don, who pooled their wits, and then the ship was built by Ken for pilot Lowe. When we last saw Ken fly it was at a 1966 meet with his dad, Vince, a fellow RC oldtimer. We were not surprised at the high level of workmanship, and excellent writing. It is a long article—and would that kits have such fine instructions. We've had to eliminate another article in this issue to avoid diluting Ken's copy. To top it off, Don Lowe did the climactic commentary based upon his piloting experiences.

With the basic fuselage box completed, all the upper and lower partial bulkheads are added. Next, install the ¼ sq. diagonal braces at the bottom of the fuselage only, and then add all ¼ sq. and ⅜ by 3/16 longerons. At this point, the ⅛ sq. longerons at the top and bottom edges of the fuselage sides are glued in place.

Fuselage top sheeting is installed in six pieces. Two pieces of 1/16 form the turtledeck. Four pieces of 3/32 form the top sheeting forward of the canopy. Cross grain ⅛ sheeting is installed for the cockpit floor, and on the bottom of the nose after the gas tank has been installed. Note: Fuelproof the entire gas tank compartment with a coat of epoxy. Add the four pieces of ¼ balsa sheet, two at the tail and two above the wing leading edge, which help fair in the longerons to the tailpost and nose. Cut wing saddles from ⅜ sheet and glue to fuselage. Add the ⅜ sq. longerons to the fuselage sides and epoxy ⅛ plywood gussets to strengthen the motor mounts.

Before gluing in the ⅛ bottom sheeting between F8 and F9, the tail wheel mount is bolted to F8. Also, if you are incorporating the detachable tail, a ⅛ plywood plate should be installed aft of F9, and the back of the fuselage should be faced with 1/16 plywood. The flat surface on which the removable tail sits is covered with 1/16 ply, the center of which has been cut out.

The aft section of the fuselage is sanded such that flat panels of Monokote result when it is covered. One flat is from the upper ⅛ sq. to the center of the ⅜ sq. The next is from the center of the ⅜ sq. to the lower ⅛ sq. Then from the lower ⅛ sq. to the ¼ sq. lower longeron, and finally from the ¼ sq. longeron to the middle of the 3/16 by ⅜ bottom central longeron.

The ¼ sheet at the back of the fuselage is beveled and tapered to fair the ⅜ sq. and ⅛ sq. longerons back to the tailpost. The ¼ sheet above the wing leading edge is faired into the ⅛ sq., ⅜ sq., and ⅜ wing saddle at its rear edge, and feathered into the fuselage side at its forward edge. The ⅜ wing saddle is sanded to ⅛ thick at its aft end, and about 3/16 thick at its forward

Continued on page 102

Zlin/Bonnema

continued from page 17

edge where it meets the ¼ sheet. The ¼ dorsal fin is sanded and Monokoted and glued on only after the rest of the fuselage has been Monokoted. Epoxy in the wing hold-downs, but do not drill yet.

Wing: The plans show a foam wing mainly because it is much simpler to build and no weight penalty occurred between Rojecki's foam wing and the built up version on the original. Each wing-half should be cut from one lb./cu. ft. density foam block at least 5 inches thick. The blocks are faced with the foam wire cutter to insure that they are square. Align the root and tip templates on the block so that there is absolutely no twist, and include the dihedral by raising the centerline of the tip rib 0.70 inches above the centerline of the root rib.

Locate the root rib in the exact same place on both blocks, so that the wing halves may be joined in the blocks on a flat surface later. Cut out the core, including the spar notches, using a hot-wire bow. Number the rib templates beforehand in equal chord percentage segments so that the hot wire may be drawn past identical chord stations at all times on both the root and tip templates.

After the cores have been cut from the blocks, cut out two templates from cardboard or thin plywood for the cutouts in the cores. Place the cores back in their blocks, sandwich together, and place a template on each side. To cut the open areas, push a piece of 1/16 music wire through one of the spaces to be cut out. Slip a center-drilled piece of ¾ in. dowel rod over each end of the wire, and attach current regulated hot leads outside the dowels. Holding the new hot wire by the wooden dowels, run it around the inside of the templates, thus cutting out the area to be removed. Repeat the procedure for each cutout area.

Tapered spars are cut from very hard ¼ balsa and glued in the cores with Titebond or epoxy. Keep the cores in their blocks and weighted on a flat surface while the spars dry. Next, cut out landing gear unit clearance, wheel wells, servo boxes, and linkage channels with copper wire forms placed in a heavy duty soldering gun.

Epoxy in the ¼ ply landing gear mounting plates with their 4-40 blind nuts already installed. These plates each have four 3/16 dowels protruding from them down into the foam for extra gluing area and added strength. Glue in the ⅛ ply bellcrank mounts and install bellcranks and landing gear linkage. Sheet the center section, leading edge, and trailing edge with 1/16 balsa sheet. Slow setting epoxy, sparingly applied to the balsa only, is recommended. Spreading epoxy on the foam does not improve the bond, but it does add considerable weight. Again, set the cores back in their blocks and weight on a flat surface while sheeting is drying.

After the sheeting is dry, trim the excess and sand flush with the foam. Add tip blocks, 3/16 trailing edge, ¼ leading edge and cap strips. Remove sheeting which has covered wheel well and landing gear cavity. Join the wing halves on a flat surface by epoxing at the center section with both halves resting in their foam blocks. Weight and allow adequate time for epoxy to set up.

Ailerons are laminated from two pieces of 1½ in. trailing edge stock glued together, longest surface to longest surface. The leading edge bevel you get is not quite enough and more must be sanded in to allow sufficient aileron throw. A ⅜ dowel drilled for ⅛ wire is embedded in the aileron near the root. ⅛ wire aileron horns are essential. An experiment with 3/32 wire resulted in aileron flutter.

The fixed portion of the wing trailing edge lying between the two ailerons is laminated from ⅜ balsa sheet. Clearance for the ⅛ wire is notched into the front of this piece. Install the aileron horn wires with brass or nylon guides before gluing on this central trailing edge section.

Drill holes clear through the wing and epoxy in four ⅜ dowels which have been drilled through for 3/16 wing bolts. Sand these flush with the upper and lower surfaces of the wing. To reinforce the wing center section, wrap first with a layer of 7-oz. fiberglass cloth and then with a layer of 2-oz. cloth. Drill through the hardened fiberglass to open the wing bolt holes. Set the wing on the fuselage and align very carefully.

Run a long 3/16 drill through the bolt holes already in the wing, and drill through the plywood wing mounting plates in the fuselage. Remove the wing, enlarge the holes in the fuselage plates, and install 10-24 blind nuts. Bolt the wing to the fuselage and build up the belly pan so that it aligns perfectly with the fuselage. Use paper tubes as bolt guides through the belly pan. Cut away the fiberglass and balsa sheet covering the servo box, and install rails for aileron and retract servos.

Rib spacing for a built up wing is shown on the plans. Using the tip and root templates provided, sandwich 15 pieces of 3/32 balsa between the templates, and sand the stack down to form ribs for one wing half. Spar location and size is unchanged from the foam wing. Leading edge, trailing edge, sheeting and cap strips are also unchanged, but 1/16 balsa vertical grain spar webbing is glued between all ribs on both front and rear spars. The landing gear mount system as shown can be used, but the ribs on either side of it must be reinforced with plywood. Wheel wells must be built up from 1/16 balsa sheet. Ailerons, tips, and center section, including fiberglass reinforcement, are unchanged.

Tail Surfaces: Foam cores for the vertical fin, rudder, stabilizer, and elevator are cut using the templates provided. 1/16 sheeting is epoxied on, as with the wing, and the surfaces left to dry while weighted in their foam blocks on a flat table. Leading and trailing edges and tip blocks are glued on after sheeting has been trimmed and sanded. Note: The 3/16 vertical fin trailing edge is an exception. It is glued to the foam core before sheeting, and the sheeting then overlaps it. Elevators and rudder have a ⅜ dowel installed which is drilled for a 3/32 wire control horn.

The joined stabilizer halves are wrapped with fiberglass cloth as shown on the plans. The following steps must be adhered to if you are

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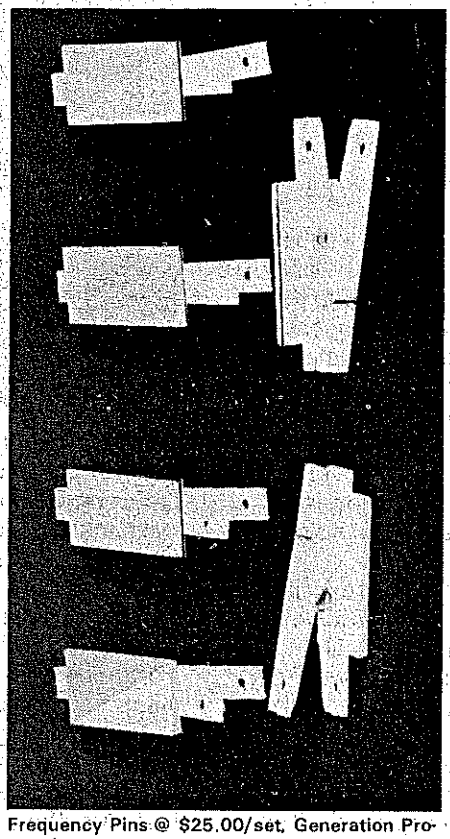

Frequency Pins @ $25.00/set. Generation Products Co., Inc., 5512 Southwood, Little Rock, AR 72205.

For safety, every radio control flying club needs some system to assure that two transmitters of the same frequency are not turned on at the same time. An orderly system does much to avoid those looks of panic and shouting from the flight line—or worse. Generation Products is producing a complete set of engraved, high quality frequency pins for club use. With these pins and a check board on the flight line, many moments of panic can be avoided. The frequency pins are made of high quality engravers plastic of a sandwich-like construction. The numbers are engraved by cutting through the top layer of plastic, thereby exposing the second layer. No paint is used and there is no fading or wearing away of the numbers. Each pin not only contains the frequency number but is also color-coded to match the flags on each transmitter. Construction of the pins is first rate, and each set should stand up to club use for a considerable time period.

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incorporating the removable tail. Spot glue a mating piece of 1/16 ply on top of the plywood tail mounting surface on the fuselage. This upper piece should be about ½ inch shorter than the fuselage piece. At the front edge of this piece, glue on another piece of 1/16 ply which matches the upper middle quarter of F8, including two 3/16 dowel holes. Insert two 3/16 dowels through these holes and glue them only to the plywood floor. Do not glue the dowels to F8. At the back edge of the plywood floor glue on F9A which is ⅛ balsa. Glue on ⅛ balsa lower saddles for the stabilizer.

Align stabilizer carefully and glue saddles. Glue on ⅛ balsa upper stabilizer saddles, and cap top of saddles with 1/16 plywood. You should now have a box structure completely surrounding the stabilizer with plywood bottom, top, and front, and a balsa back. Do not break from fuselage yet.

Spot glue another piece of 1/16 plywood to the top of the box structure. At the front edge of this piece, glue on a piece of plywood which matches the uppermost portion of F8 including the 3/16 dowel hole. Also glue two blocks of ⅛ plywood to the top of the plywood floor as shown on the plans. Drill one 4-40 clearance hole through the center of the front block and clear through the stabilizer box. Drill two 4-40 clearance holes through the rear block and again clear through the stabilizer box. Enlarge all three holes in the ⅛ ply blocks only, and install 4-40 blind nuts. Insert a piece of 3/16 dowel through its hole and glue it to the plywood floor only. Do not glue the dowel to F8.

Now, spot glue a piece of ⅛ plywood to the original 1/16 plywood tail mounting surface in the half-inch space left open behind the stabilizer box. This ⅛ block should fill the entire space, but should be 1/16 short in width on both sides. Drill two 4-40 clearance holes through this block and through the corresponding block in the fuselage underneath. Enlarge the holes in the upper block only and install two 4-40 blind nuts. Now glue a piece of 1/16 plywood which matches the back face of the stabilizer box to the ⅛ plywood piece just installed, and to the 1/16 plywood floor spot glued to the top of the stabilizer box. Do not glue this piece to the stabilizer box at all.

Now take the sheeted vertical fin with its extended hinge line post, and cut clearance in the bottom of it for the two plywood blind nut blocks and the 3/16 dowel mounted on the upper plywood floor. Trim the rudder post so it just contacts the plywood blind nut block behind the stabilizer box, and trim the vertical fin sheeting so it fits over the outside edges of the plywood block and lines up with the fueslage sides. Glue the vertical fin to the upper plywood floor and to the plywood pieces behind the stabilizer box. Be careful not to glue the vertical fin assembly to the stabilizer box. Glue in and sand two balsa blocks which fair the vertical fin into F8. Finally, add the ¼ in. balsa dorsal fin to the assembly.

When all is dry, separate the vertical fin assembly from the fuselage and stabilizer box, using a razor blade to break the spot glue joints. Then separate the stabilizer box from the fuselage in the same way. Enlarge the three holes in the stabilizer box from its lower side. The holes should only be opened up in the lower plywood floor and in the stablizer itself. Do not enlarge the holes in the upper plywood cap. Glue in paper straws to act as screw guides.

Now you can sit back, relax, and curse yourself for not building the fixed tail. To fix the tail surfaces, simply eliminate all the plywood pieces, enlarge the balsa pieces accordingly, and glue everything together permanently.

Finishing: Monokote or Solar Film is strongly recommended. These materials closely simulate the fabric covering of the full-scale airplane, and they offer the lightest overall weight for a complete finish.

The fiberglass engine cowl and a molded cellulose acetate canopy are available from Aerocomposites Corp., 411 Townsend Place, Dayton, Ohio 45431. The cowl and the framework molded in the canopy are painted to match the Monokote colors used. The paint scheme on OK-WKE represents the Czechoslovakian Team colors. The other airplane shown is done in British Aerobatic Team colors. Since so many countries fly the Zlin, there is a large variety of color scheme options to choose from.

Installation: Radio installation is fairly straightforward. If you use a .60, stow the flight pack battery above the gas tank. With a .91, locate the battery above the servo tray or even further aft as necessary to achieve the proper CG. The receiver is foam wrapped and sits in the fuselage bay just in front of the servo tray.

Aileron and retract linkage are as shown on the drawings. The plans show independent control horns on each elevator half which require a "Y" pushrod that exits the rear fuselage on both sides. As an alternative, the elevator halves may be joined to a central horn with a single pushrod concealed in the fuselage. The rudder pushrod may be attached internally to the tail wheel steering arm before it exits the fuselage side on its way back to the rudder.

Flying the 526 AS: The Zlin is designed to be a high-performance machine capable of performing all AMA, FAI, and Vegas Tournament maneuvers. Flying the aircraft is pure pleasure and not at all difficult considering its very high performance potential. Takeoffs are a piece of

cake. Landings require a little care to prevent tip stall, but are still very slow with the generous wing area. I would not recommend you drag it in with the nose high, however. Super docile landings could be achieved, with some sacrifice of snapping capability, by blunting the wing leading edge toward the tip.

You can play with its performance potential by starting with a forward CG and slowly moving it back to improve snapping and roll characteristics. I used a fairly aft CG location to get the very best performance in snaps and rolls. I also worked a bit with wing incidence and engine thrust line. The zero-zero set up works well with a little bit of engine right thrust to ease torque effects.

Speaking of torque, the Webra .91 pulls the aircraft along with ease using a 14-6 or 7 prop. I used a non-stock .60-size Perry pump carburetor on the Webra, and since it will only turn 10,500 to 11,000 with this carb, prop choice becomes critical. Vertical performance is the first thing to suffer if engine and prop are mismatched in large, high-drag airplanes like this one.

I recommend very stiff torque and pushrods throughout, since control loads are high. You will want to use husky servos without extremely tight centering or resolution. We have found with big ships that rapid pot wear occurs if servos are tight due to control loads and increased control surface "dither." Fortunately, you will find these large slow aircraft to be more tolerant of control dead-band than high-speed pattern ships.

I'm sure you will especially appreciate the very tight looping and cornering capability of the Zlin. The large wing with low wing loading will give you spectacularly tight square loops. Rolling maneuvers will require a little more work than a standard pattern ship due to reduced airspeed, smaller power loading, and the somewhat short-coupled design. You'll find this and other large, slower aircraft require increased proficiency with the rudder on the part of the pilot. I really feel that you will enjoy flying the Zlin because it combines realistic good looks with fine aerobatic performance.

What more could a modeler ask?

Trans America/Riches

continued from page 24

all that was necessary to know there would be no flying on this Wednesday. That made two Wednesdays in a row.

After the awards presentation in the motel, with the Meridian team first by only 3 minutes ahead of the number 2 Montgomery team, the officials were off to Jackson, MS for the start of the next leg.

The high winds were bothering the Riches' pick-up, but they were worse for the "Saggin' Wagon." The AMA motorhome that Bob Roach drove had a bad left rear spring, causing a perpetual lean; hence, "Saggin' Wagon."

The weather was clearing in Jackson, reports pretty good for the next morning, but that didn't help Jimmy Grier tonight. Three of his team members and the airplanes were still in Chicago. Jerry Nelson was to have been in Jackson already with the planes, but Hurricane Frederick had delayed them slightly, so they would be there early the next morning.

Doc Edwards and Jimmy were at the takeoff area early, but the rest of Team 3, the BTHOOM Team wasn't. They were in Jimmy's Cessna somewhere between Chicago and Jackson. It didn't look good, even though they had been up until around 2 a.m. fixing Doc's truck as the pilot vehicle, and had borrowed a lead vehicle. It didn't look as if the BTHOOM team was going to make it. You are not alone if you ask what a BTHOOM team is. When Jimmy Grier was asked what the name of his team was, he replied after a slight delay, "Beats The Hell Out Of Me."

The other four teams were off and away from the frontage road takeoff area, and still no planes for Jimmy's team, and no rest of the team. When they did arrive there was a frantic rush to get them ready and in the air. All of this was being taped by a TV crew that had arrived late.

The teams ran close on this part of the leg, passing each other at pit stops. All of the teams had good times, the team work payed off even though there were three planes that crashed.

Everyone was ready for the takeoff in West Monroe, LA, with the mayor on hand to see the planes off. The police were there to help the teams get through the traffic lights and onto the freeway. The fire department added a nice touch with hot coffee for everyone.

Bob Roach was much happier now. His wife, Sue, had joined him in Jackson. She would take care of selling the chances on the Pitts Special and souvenirs for the rest of the trip.

As usual, the day's flights were not uneventful. Murphy's Law again, but all of the teams were close, coming into the Sharks field in Bossier City, LA. The Shreveport club had a big reception and barbecue ready. The police escort from the freeway to the field was a big help, but did cause some confusion.

Doc Edwards was trying to get his lead vehicle ahead to guide Team 3's pilot vehicle into the landing area. A police car raced past going the other direction, siren wailing, lights flashing. When the police car made an abrupt U-turn, Doc jammed on the brakes to let them pass. As Doc was watching them pull alongside he thought he had bought one for sure. A policeman leaned out of the window and with a big sweeping motion of his arm, yelled, "C'mon, let's make it." Doc told Doris a little later that he was lucky not to have had a coronary. Team 5, the Sharks Club team, fittingly received the champagne for the first team in, and top honors for the leg.

At Shreveport, John Embry, AMA VP for District VIII, and Bo Kinch, from the Lake Charles club, joined the race as CDs. They had volunteered to fill last minute vacancies on this leg. Bo was to continue on to Abilene, TX to help out.

The flight from Shreveport to Dallas was a long one and that makes for more pit stops and possible trouble. Out of the five that started from Kelly's Truck Stop that morning, four made it with no more than the normal number of problems with broken props, bent landing gears, deadstick landings, lost hatches, and a crash or two.

There had been an addition to the morning briefings. "Don't wear the race hats in the back of the pilot vehicles without tying them on." Because no one was going to lose valuable time retrieving them, the race route was well marked by lost blue-and-white hats.

The flight from the Mesquite Model Field to Ft. Worth was even more uneventful, and the five planes made the short flight, about 50 miles, in good time. A high point of the takeoff at Mesquite was the reading of a proclamation from the mayor of Dallas by AMA past president Johnny Clemens. He, along with the mayor pro-tem of Mesquite, gave the planes a good send off to the landing at the Tarrant County Junior College landing area in Fort Worth.

Jim Simpson's Southwest Modelers RC Club team had the least number of problems and took the first place hardware, but by only three and a half minutes ahead of John Kiker's NASA Flyers, from Houston.

The takeoff from Ft. Worth was on a Wednesday,