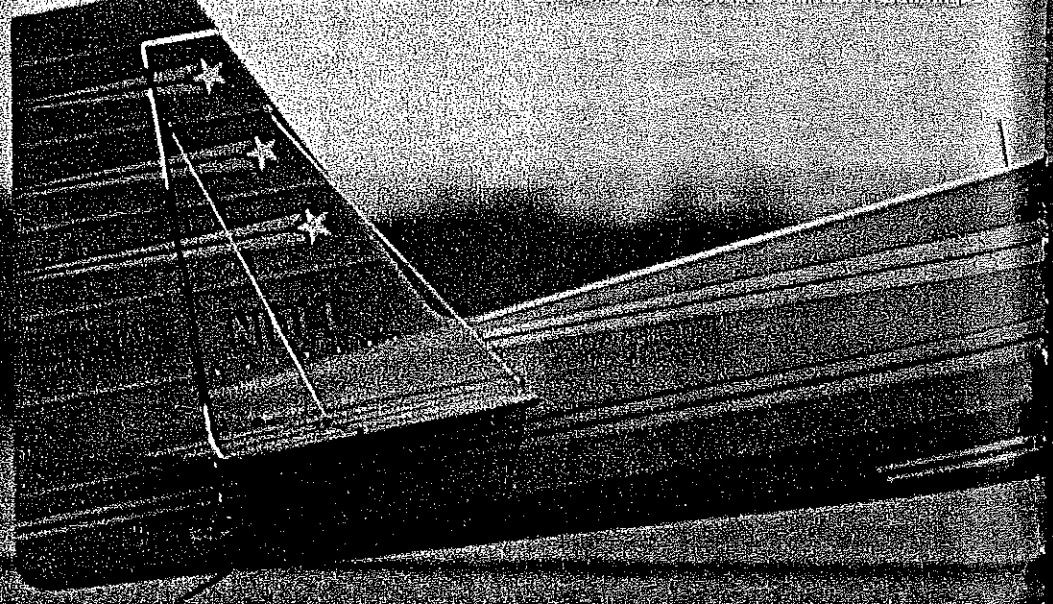


The canopy was also built in Germany, a good example of the Leo Loudonlager Overlay, a William Pratt, Ohio, and Edmundo's design. The canopy is made of sheet metal screws and is held by a frame of one of at 3/4 inch and 1/2 inch. Note how the canopy fits into the wing.

THE STORY of the Laser actually goes back to 1971 when Leo Loudonlager, a young, airline pilot with a new, radical idea called the "Laser Aero," decided to mix it up with the big boys in aerobatic competition against a sea of Pitts Specials flown by everyone who was somebody in American aerobatics. When Jim Young, pilot and his buddy, Jim Roberts, was flying a newly built Pitts "Playboy," entered their first contest. Leo won the Intermediate division, and Jim was Junior Sportsman. In the 1971 National Aerobatic Championships, Leo impressed the judges enough in his first Unlimited contest to be named assistant judge at the 1972 World Championships in

Canada. Leo's canopy is removable, providing access to the wing and then the radio compartment. The canopy is a section of a 50 x 16 inch, carefully study of all one will aid in building



The Model:

LASER 2000

Some people say it takes a really big hot running engine to get good smoke output, but this pic shows that it isn't necessarily so. Smoke generator makes for spectacular lights, and isn't all that hard to make your own from a diaphragm valve or author's design. Mike Bilsa photo.

years. When he gained some real fame in 1972.

Bob entered his first contest in 1972. He came away with a fifth place, but that didn't put him on the U.S. World Championships scene because the team is chosen only in odd-numbered years. In the meantime, his fertile mind and driving ambition (his Laser is nick-

named "Beautiful Obsession") caused him to start making changes in his aerobics machine. Along with Jim Roberts as a partner and collaborator, also with Bud Storms and Joe Osinski doing a lot of the work, the Laser was born. Leo and Jim flew the

only full-scale version that launches the as-built and Shepherd's model and not the wingspan's final Laser 200. Promotions arrangements of his aircraft are made by model magazine staff. Leo and Jim flew the

The full-scale version is probably the best aerobics airplane in the world. With a .40, the model is an equally excellent performer in RC Sport Scale. Put in a smoker and have some fun. Further on, in a separate article, read more about the development of the Laser 200.

■ Brad Shepherd Photos by the author and Leon Folse

aircraft and coached one another.

Jim then decided to build his own Laser, and it took to the air in 1978. There is very little difference in the two aircraft. Jim's has a shorter landing gear, a slightly different cowl, and a different paint scheme (both planes are basically metallic blue with light yellow trim, but the trim and stars on Jim's are different than on Leo's).

Both Lasers will represent the United States in the World Championships in 1982 in Europe, as Leo took another first in Unlimited and Jim came in fourth at the National Aerobatic Championships in Sherman, TX in October last year.

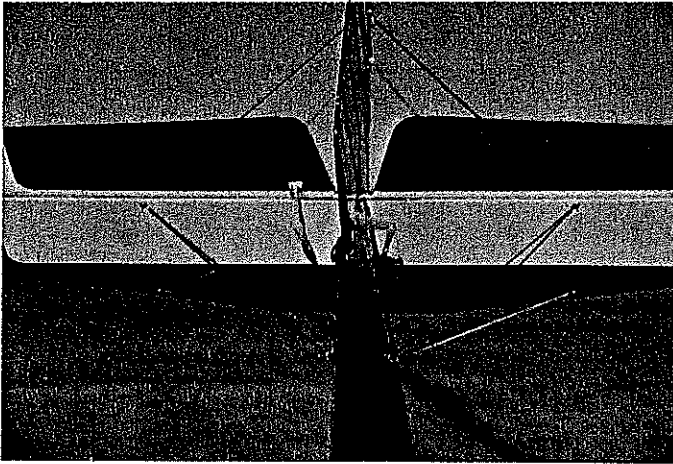
Henry Haigh, who is flying a modified Stephens called Super Star, which is much the same as the Lasers, will also be in the World Champs, as he was runner-up to Leo at the Nationals.

Permit me to take a short look back to a somewhat prophetic statement made by Don Berliner in a 1973 article on aerobatic airplanes and in talking about the Stephens Akro: "One of these days something is going to come along to knock the Pitts off its lofty perch." That day is upon us, it would appear, with three out of the top five at the Nats flying versions of the original Stephens.

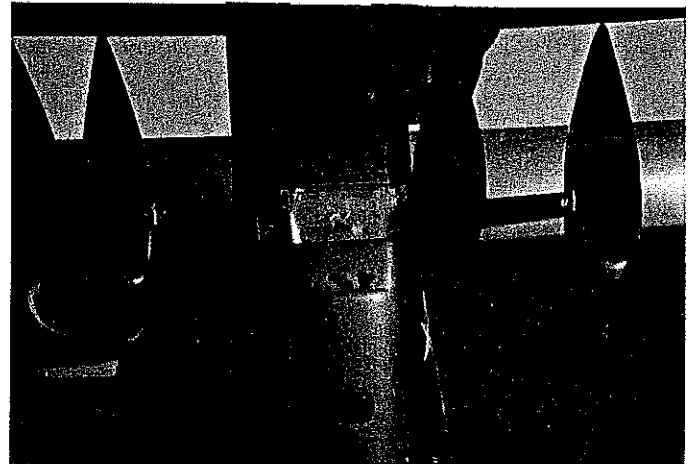
So much has been written about the exploits of

Leo and the Laser that I couldn't add anything new of substance. However, I had the pleasure of meeting Leo and Jim during the 1981 National Championships at Sherman, and I found out that both of them fly RC. During the low-ceiling weather (when the full-size planes were grounded) they both flew the model I had taken with me, a modified Stephens with a smoker for 'kicks' (Super Akro 'Chips'—June 1981 *MA*). I don't know if they ever plan on entering competition RC, but keep an eye on them if they do.

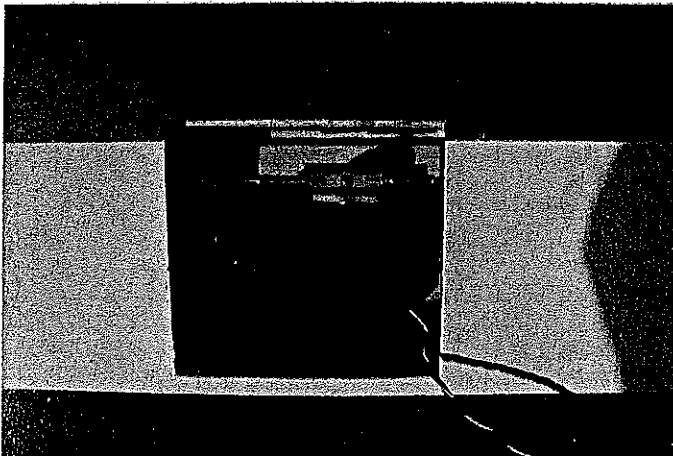
The model. A few years back while mulling over



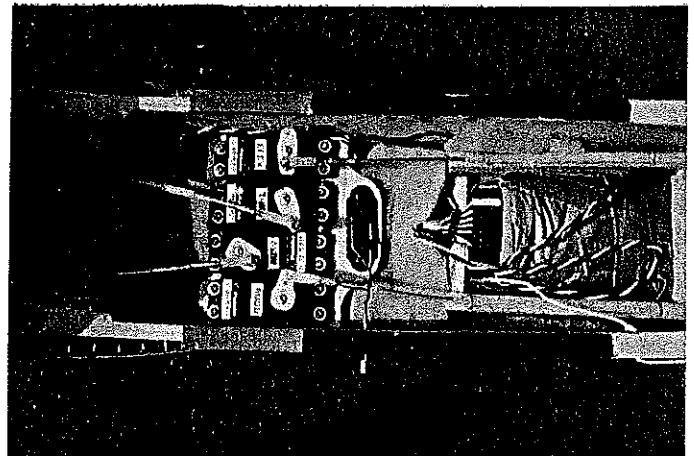
A good view of the brace wires on the tail feathers—.045 music wire terminating in #26 solder lugs held on by 2-56 bolts.



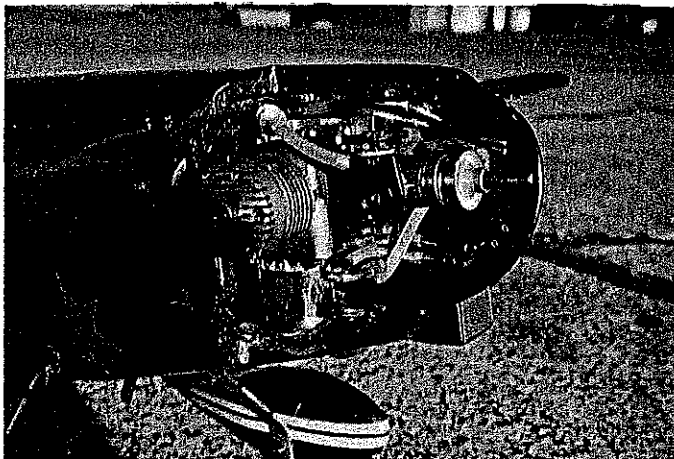
Landing gear attachment. A single tapped hole in the middle holds the fairing block. Note slight toe-in of the wheels.



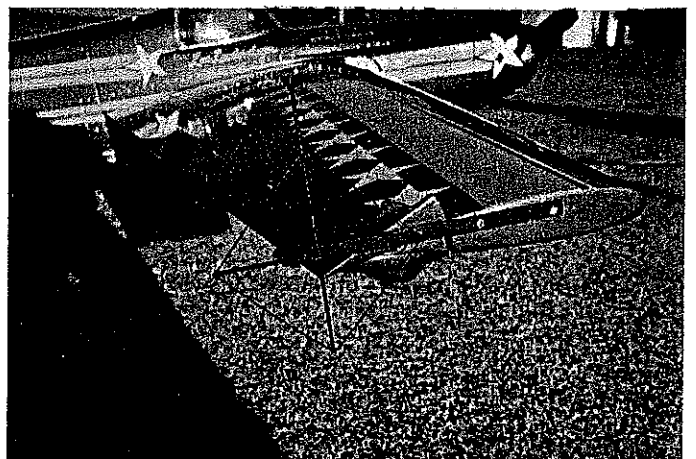
This is the underside of the wing center section showing how the aireron servo is installed and hooked up. Attention to detail pays off.



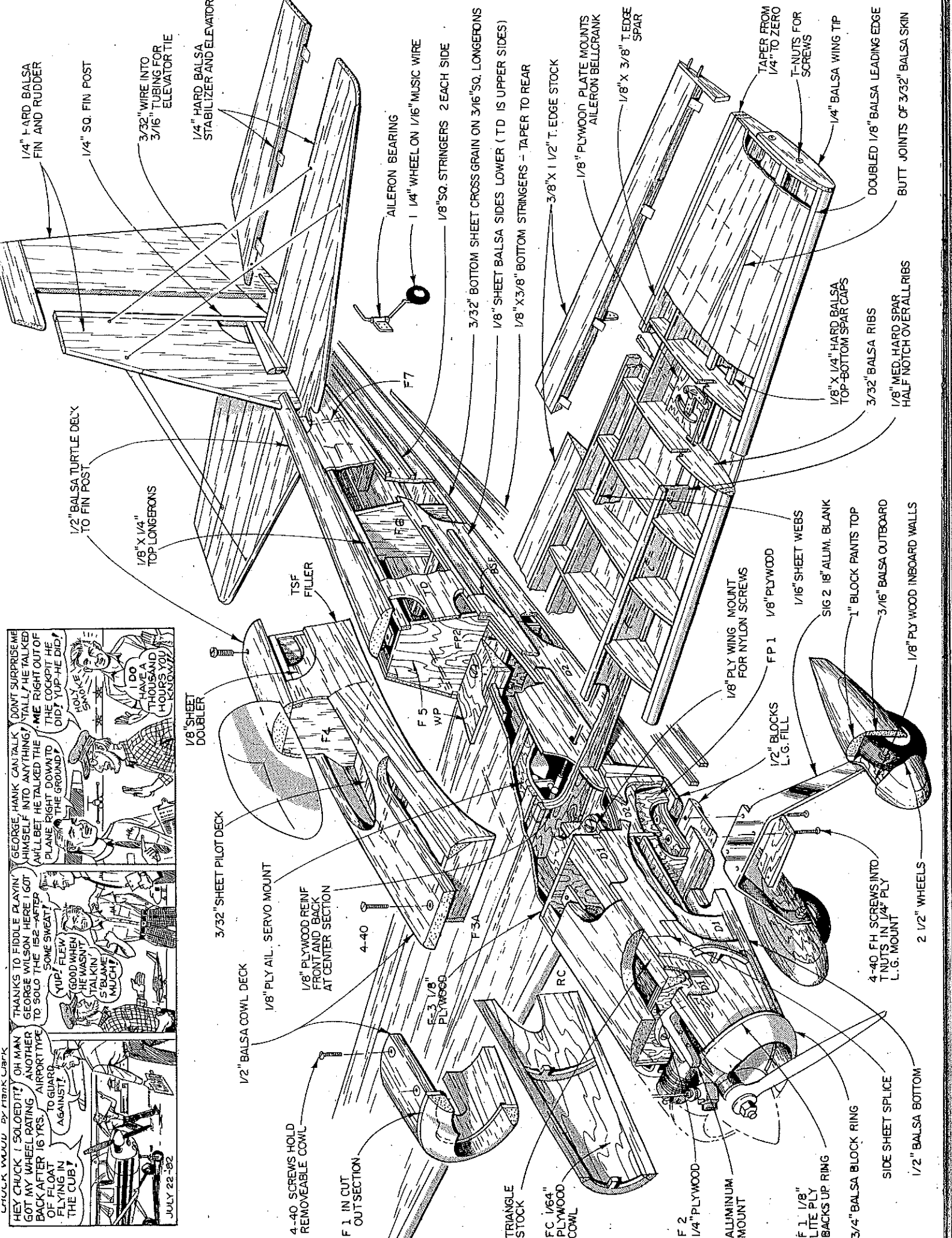
Just wide enough for four-across servos. Pushrods all are of the cable type. Receiver and batteries need to be well padded.



Lots of plumbing needed in the engine compartment for filling/venting both the fuel and smoker tanks, plus feeding the engine and smoker.



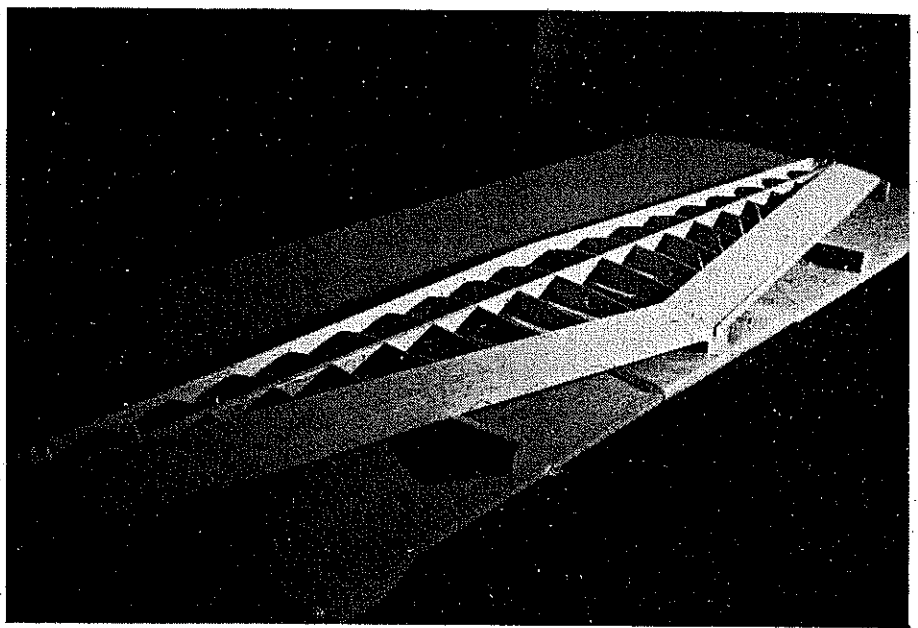
On the wing tip is the guide to aid the pilot in performing precision aerobatics maneuvers. Note rib stitching on ailerons, mass balance.



what to build next, a decision was made to develop the aerobatic model for RC—not for FAI-style flying, but an aerobatic ship that would perform like its full-size counterparts. It should be able to do Aresti-type flying and have a smoker in it for visual effects in doing air-show-type flying on weekends. The Super Akro 'Chips' was born. After that came one called Dusty (it is a little larger than 'Chips' with some slight changes in the force arrangement). Inevitably I was led to the best aerobatic machine flying today, the 1980 World Champion Laser.

You can't improve on something that is close to perfection already, so I wrote to Bob Morrison of Repla-Tech and purchased his book on aerobatic airplanes (RS-5000) and a set of color pictures taken of the Laser at the World Champs in Ceske Budejovice, Czechoslovakia in 1978. This material was used as the basis for the model of the Laser presented here. If you are planning on entering the model in Sport Scale competition, or even if you just like to build and fly Scale models for fun on weekends, I suggest that you obtain these materials from Repla-Tech, 48500 McKenzie Hwy. Vida, OR 97488. The pics and three-views are used in my presentation book on the model for Sport Scale contests. The model's first contest was in Houston, TX at the Manned Spacecraft Center RC Club All Scale Rally on October 31 and November 1, 1981 in front of some very strict judges. The Laser took a first place, nosing out some fine Scale models, so it obviously has the potential to be a winner in competitions. On the other hand, if you build and fly just for enjoyment, you will find the construction of this model to be as uncomplicated as the average kit for sport flying.

It was a winter day in my home town of Victoria, TX, 45°, sunny, with light variable winds when



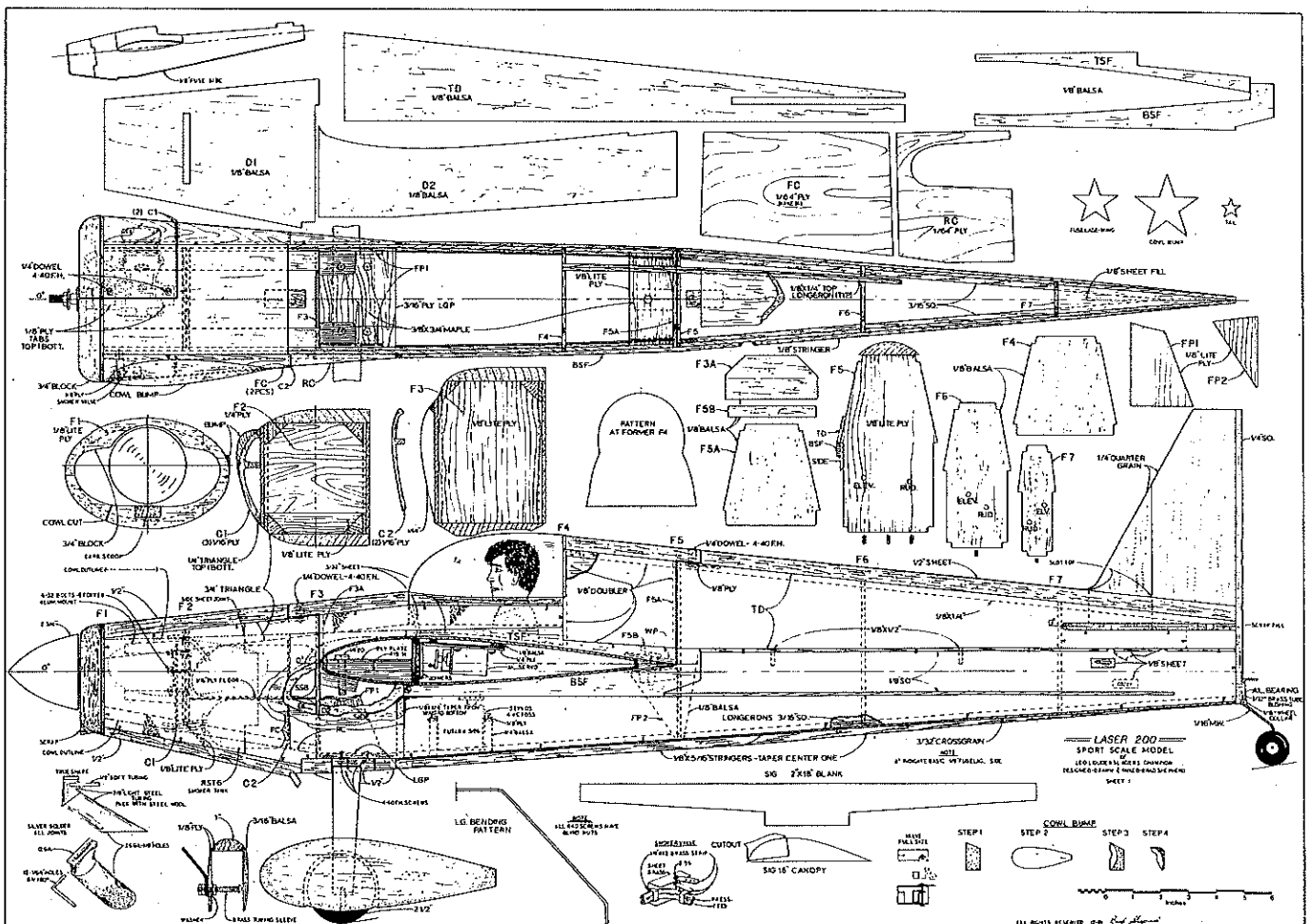
Wing panels being assembled, rear top sheeting glued and pinned. Note tip jigs, 9/16-in. shim under center section, and tapered blocks positioned midway on each half.

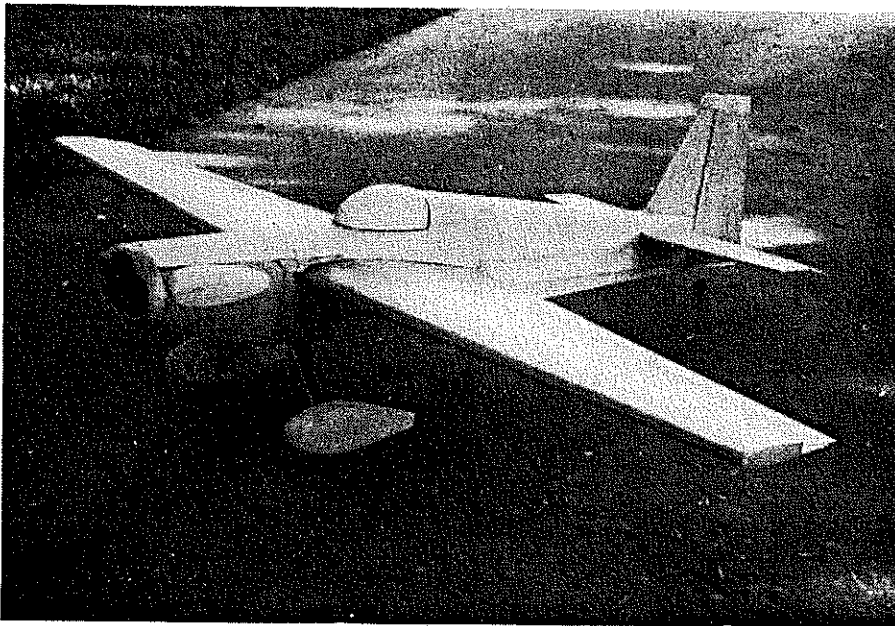
the model first took to the air. I arrived at the field at about 8:15 a.m. and unloaded the model and gear. About 10 minutes later my good buddy, photographer, and fellow modeler, Leon Folsie, arrived with his equipment.

It took about 30 minutes to get the engine adjusted and running just right, but no problem with the smoker. The cowl was screwed on, and both tanks (fuel and smoker) were topped off. I fired up, taxied out, and lined up. Pushed the throttle

against the firewall, fed in a little right rudder. In about 100 ft. it was off by itself. Made a shallow right climbing turn. No trim was needed on the straight flight back. Next, I made a 180° turn and tried a roll (it was a little slow getting around).

Made a turn back, kicked in the smoker, and did an inside loop. It tracked without any correction. Chopped the smoker and made a turn, flipped on the smoker again and did a Cuban 8. With no wind the smoke was 'hanging' good, and I was grinning





All the construction has been completed, and it's ready for putting on the finish—canopy masked for protection. If built for competition, get scale documentation from Repla-Tech International.

from ear to ear. Went straight out, cut off the smoker, made a turn, dove a little, started the smoke, and did a knife-edge across the field. I've never had a model fly this well on a test flight.

After the knife-edge it was turned downwind, and the throttle was eased back. Made a turn into final, and it settled into a near-perfect landing. I could have left the wheel pants on, as the takeoff

and landing were no problem at all.

The aileron links were put into the next hole on the horn for a little more throw; the tanks were filled for another flight. Engine running, I pushed the stick forward, and the K&B .40 started singing. As it accelerated, the smoker was kicked in. It rolled about 50 feet more—smoke pouring out on the runway. I pulled up to 45° and did an inside

snap (thrill time).

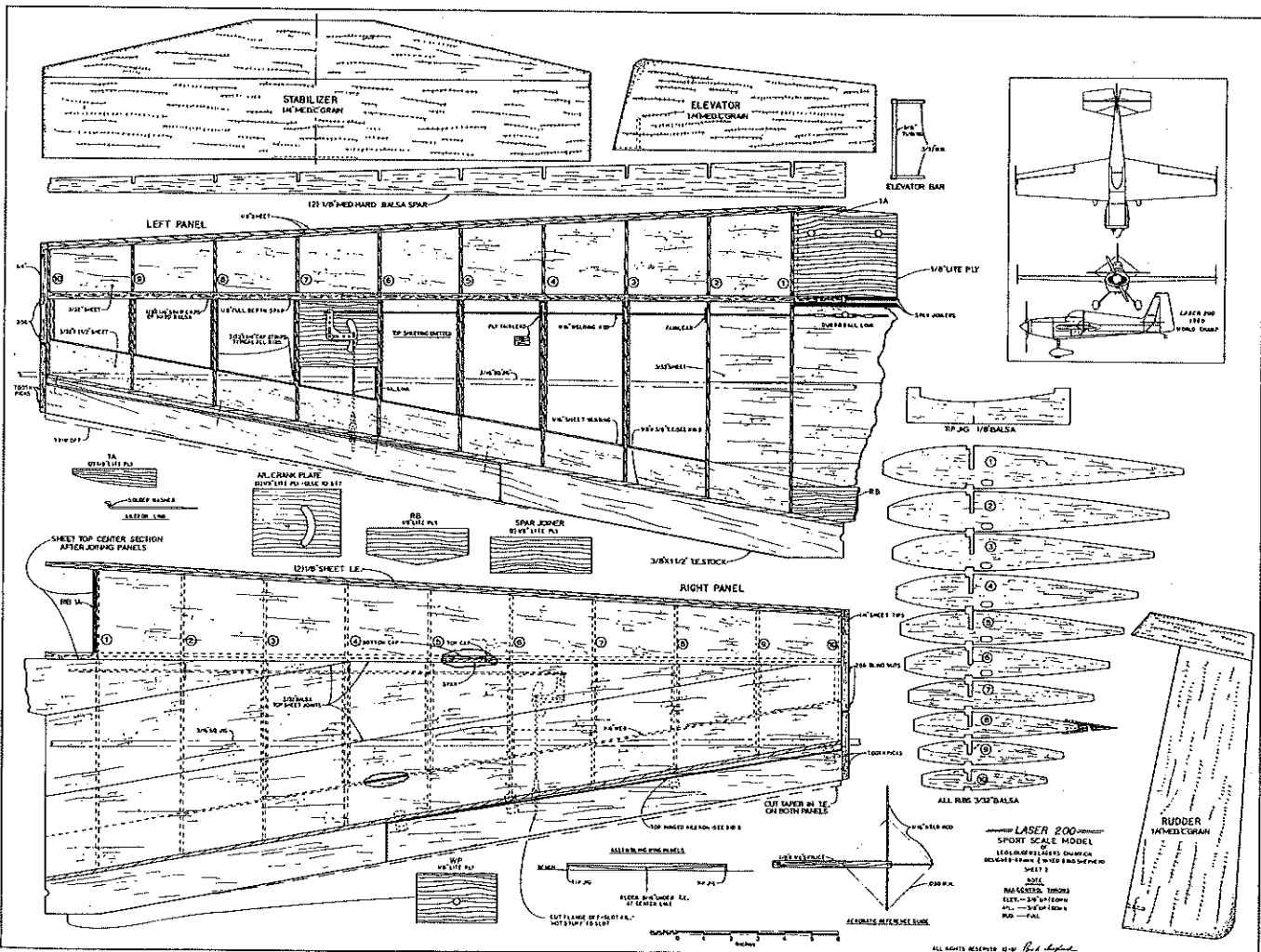
Ah, the joy of it all! On this, the second flight, the model did a Lomcevak. With the smoker going, this is quite a sight. It did inverted flight, a full-power hammerhead, four inside consecutive snaps with full power, an outside snap, reverse knife-edge, and a vertical climbing roll—all these with the smoker going.

Two more flights were put on it that morning. I must say that it is a real joy to fly, and the smoker gives it an added dimension. I tried a tail slide. It entered beautifully, but my lack of finesse with the sticks did not allow it to complete the maneuver (I'm gonna practice).

The .40 moves the plane at just about scale speed. Vertical maneuvers are good, so I feel there is no need for a larger engine, but if that's your thing, there should be enough room up front to fit one in. Study the plans while reading the instructions, and you should not have any problem in building it with off-the-shelf model supplies.

Construction. Select your balsa carefully, and the model will turn out at the right weight for good aerobatics. Here's a trick that's useful for most all models. If you check your sheets of balsa, you will find that most will balance heavy at one end. A good rule of thumb and a little catch saying to remember is *front and center*. Always put the heavy end toward the *front* of the fuselage and/or the *center* of the wing.

The wing has to be built in order to complete the fuselage, so this would be a good place to start construction. All the parts are full-size, and dimensions can be taken directly from the plans. There are a number of ways to make the ribs: 1)



FULL-SIZE PLANS AVAILABLE... SEE PAGE 164

make tracings of the ribs, 2) use carbon paper over the balsa for direct transfer, or 3) use the root and tip ribs with 10 blanks of balsa stacked for carving. In the latter method, I put the tip rib on the outside of one end of the stack and the root rib between the first and second pieces. I use 1/16 ply patterns of the root and tip ribs when carving this way.

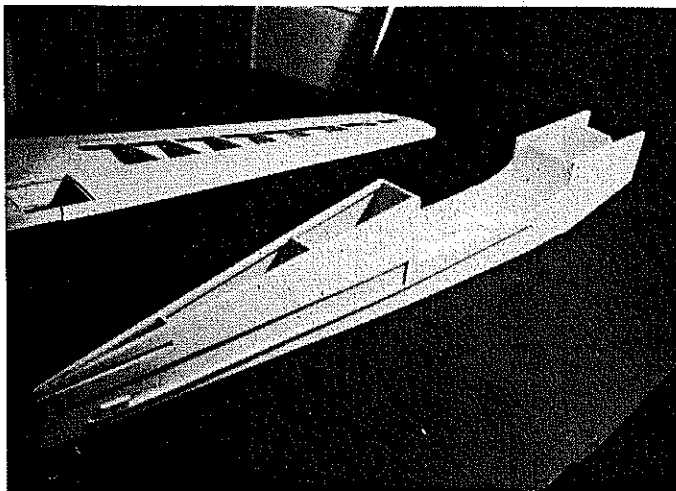
The spar pieces are all cut from the same piece of straight-grained balsa to ensure uniformity. Pin a piece of hard 1/8 x 1/4 balsa over the plans as shown for the spar cap. Glue the spar to the rear edge of this with the slots up, keeping it 90° to the

workbench. Check the fit of each rib and trim where necessary. Pin over the plans as shown the 3/16 square 'jig' and a straight piece of 1/8 x 1/4 as the inside piece of the leading edge. Check-fit each rib again; when OK, glue them in place, pinning securely to the jig.

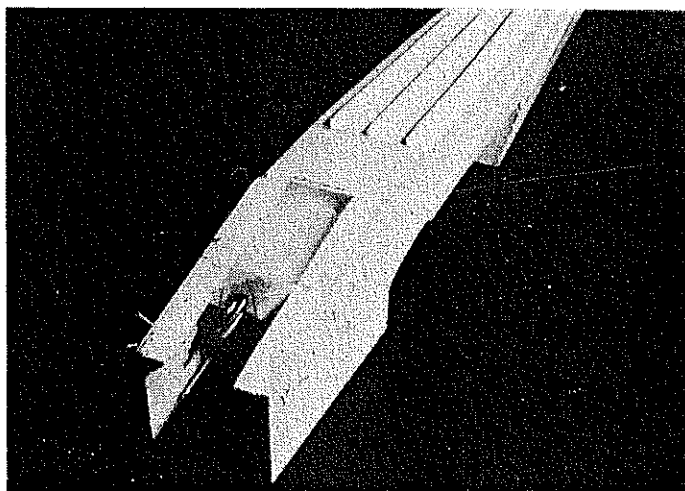
Cut a sheet of 3/32 x 3 x 31 medium C-grain balsa in half along the length for the trailing edge sheets. Glue a piece of 1/8 x 3/8 x 31 balsa to the edge of each of these sheets at a 90° angle. Note the side view of the fuselage drawing which shows the root rib, and also rib #8 on the wing plan. Glue the trailing edge sheet to the rear of rib, firmly

butting the 1/8 x 3/8 firmly against them.

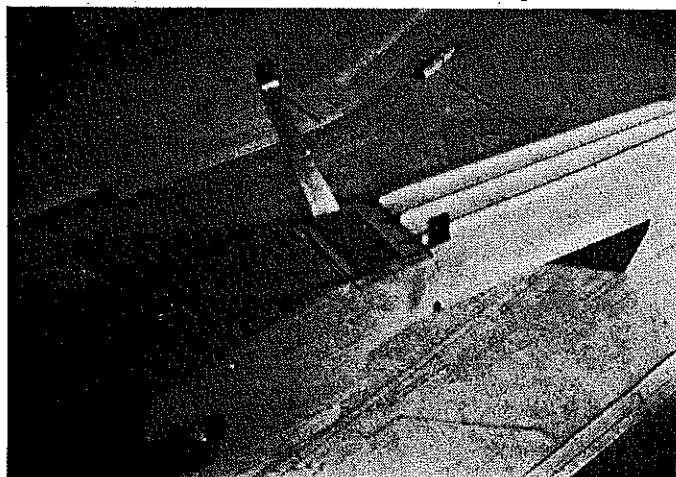
Check-fit a piece of hard 1/8 x 1/4 balsa on top of the spar. This cap has to fit flush with the ribs. Glue in place when fitted. Lay a piece of medium A-grain 3/32 sheet balsa over the ribs in front of the spar. Sand an angle to the edge so it fits the 1/8-in. leading edge piece. Mark the excess over the rear edge of spar, and trim this off. Glue and pin the sheet in place, making sure the ribs are still pinned down firmly to the 3/16-in. jig. I use slower drying cabinet-type glue over the ribs and model-type cement along the leading edge, as a dope-type finish was employed on the model.



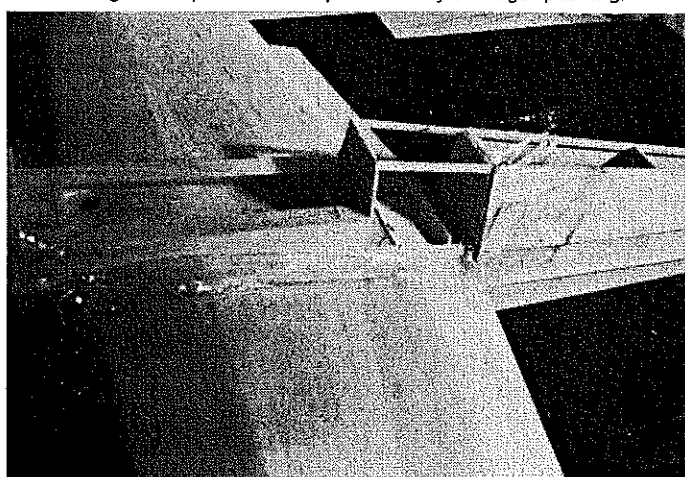
The basic fuselage is pretty well underway here. Note 1/8 sheet for pushrod exit. Wing behind still needs center sheeting.



Bottom stringer, smoker tank, 1/8 ply under firewall, and 1/8-in. triangles have been glued in place. Note T-plins for easy-on-finger pushing.



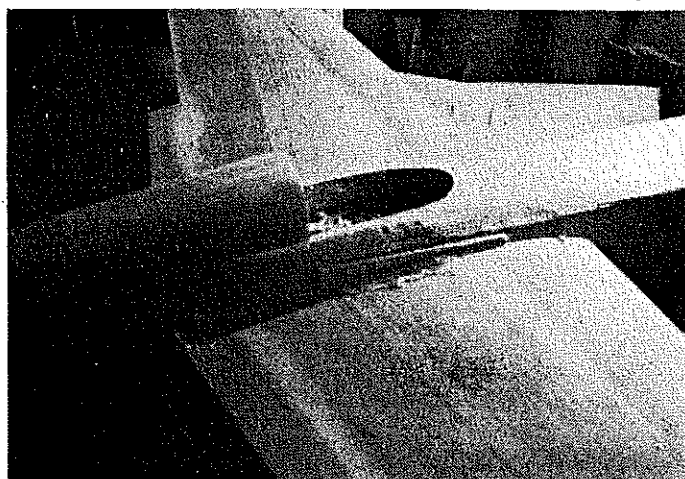
Here, the landing gear is being fitted to 3/16 ply. The fuel tank already has been installed and so has the engine/mount for fitting.



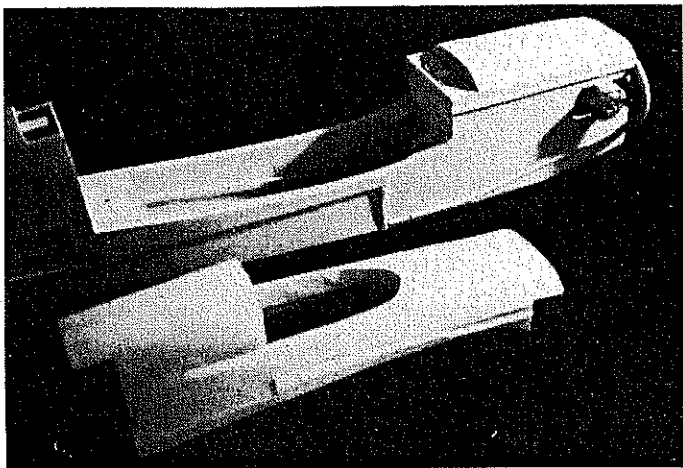
This pic shows important steps in building the cabin section. Note polyethylene sheet where it will separate from the wing and fuselage.



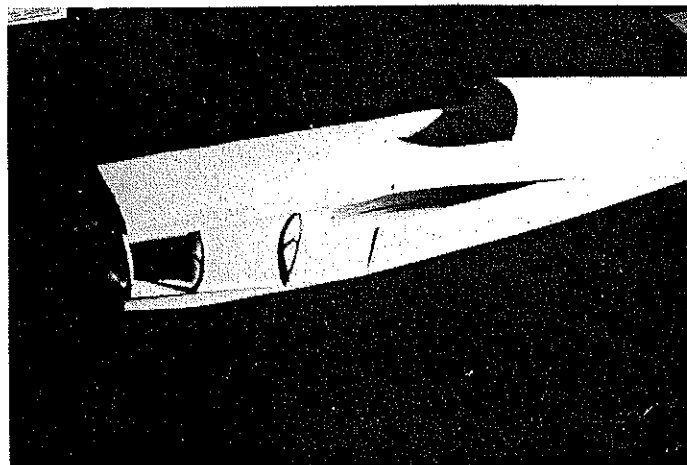
She's really beginning to take shape now that most of the major components are in place. Cockpit inside carved to 1/8 in. of canopy.



Note shape being carved at the rear of the cockpit. Fuselage side piece TSF, above the wing, has been rough-carved.



The 1/4-in. triangular cowl outline pieces have been glued on, as have the 1/8 x 1/4 rear strips. Note maple blocks for nylon wing bolts.



Ply cowl formers C1 and C2 glued in place, rear 1/8 x 1/4 strip sanded to a taper, vent hole cut in engine bay forward of C1.

Cut the aileron crank plate from 1/8 Lite Ply, then mount the crank. Cut the fairleads for the pushrod from 1/16 ply. The pushrods are made from 1/16-in. copper-coated welding rod (it doesn't rust, solders quite well, and bends are easily made). Make the bend for the aileron crank, slip it on the crank, slide it through the holes in the ribs (slipping the fairleads on as you go), then glue the aileron crank plate at the cutouts in ribs 6 & 7. Cut and glue the 3/32 x 1/4 cap strips to the ribs. Don't sheet the center section at this time. When the glue has dried on the panels, unpin from the workbench.

I use an inside flush door to assemble the panels into a full wing; these doors are flat, straight, and pins push easily into them. Draw a straight line 6 ft. long about 6 in. from one edge of the long side. Draw a line at 90° to the 6-ft. line at its center. Draw two more lines at 90° to the long line spaced 29 3/8 in. each side of the center line; pin the tip jigs to these lines. Place a scrap piece of 3/32 sheet where the center line crossed the long line. Make sure the lines on the jigs match the long center line, as this builds the proper tip washout into the wing.

Pin the panels down at the center section, lining up the rear edge of the spar over the long line and the mark on the tip jig. Place a 1/16-in. shim under the trailing edge at the center section, and pin down. About halfway out on each panel at the trailing edge, shim to assure a straight trailing edge when the top sheeting is glued on. Note the pictures of the wing being assembled.

Epoxy the ply joiners to the spar and ply piece RB to the trailing edge. Choose matching sheets of 3/32 balsa for the top sheeting in order to have a balanced wing and to keep from having to add a lot of weight to one tip. Fit and trim the top sheeting ac-

ording to the drawing of the right panel. Be very careful when gluing the top sheeting on, as the wing is just about impossible to twist (or untwist) once this sheeting is in place. Don't sheet the center section over the leading edge yet.

When the sheeting glue has thoroughly dried, remove the wing from the board, turn over, and pin down (after removing all the jigs from the board). Epoxy ply 1A ribs to the inside of #1 ribs flush with the bottom curve. Sheet the bottom center section behind the spar. Glue the 1/16 balsa webs between ribs at the leading edge of trailing edge sheet. Turn the wing over. Epoxy the 1/8 ply plate in place over ribs 1A. Sand the 1/8 trailing edge flush with the top sheeting. Pin one panel down to the bench along the trailing edge over wax paper or poly sheet.

Take the 3/8 x 1 1/2 trailing edge stock and check-fit it to the 1/8-in. trailing edge. Sand where needed for a tight fit, cut the proper angle at the center section, and glue and pin to the wing. Repeat the procedure for the other panel. Using a long straight-edge, trim the trailing edge stock as shown on the plans. Sand the trailing edge so it makes a smooth transition from the wing sheeting. Lay out the ailerons with a ball-point pen, and cut these away. Sand the angle to the leading edge of the ailerons as shown on rib #8 of the wing drawing.

Sand the 1/8-in. leading edge piece flush with the sheeting. Cut a piece of 1/8-in. sheet a little wider than the leading edge, and glue it to the wing to complete the 1/4-in.-thick leading edge. (This method of laminating the leading edge has three positive results. It is stronger than a one-piece leading edge, is less susceptible to warping, and is easier to sand to the proper shape due to the glue joint

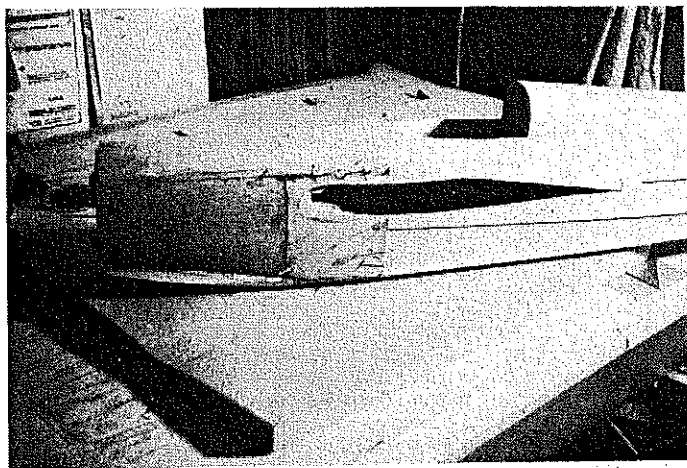
acting as a guide.) Glue on 1/4 sheet tips, but don't glue the portion that makes up the aileron mass balance. Sand the tips to shape around the tip rib, then cut off the aileron mass balance. The balance is then glued and pinned with toothpicks to the aileron.

Fuselage. If you have access to 1/8 x 6 x 48 sheets of balsa, it makes the job of fuselage side fabrication a little easier. If not, glue two sheets of 1/8 x 3 x 36 together to form six-inch sheets; do this three times as there is a side joint to be made, as follows. Cut two 6 x 8 pieces from one of the sheets. Make a dovetail joint on one end of the 1/8 x 6 x 36 sheets as shown on the side view of the fuselage plans, then make a matching joint on the two 6 x 8 pieces. Glue together for the basic sides.

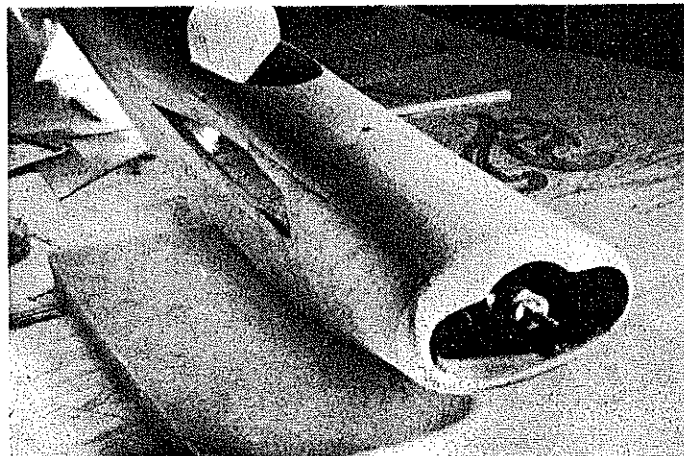
Lay out the thrust line on one sheet with a ball-point pen, and use this as a reference point while fully laying out the side. Basically it is all straight lines. Refer to the isometric sketch and the arrows on the side view as the layout is made. When the layout is completed, cut the side out and use it as a pattern to make another.

Cut the doublers from 1/8 sheet, and glue to the sides. Glue the 3/16 sq. longerons to each side, then cut the cabin section of sides away (set aside for the time being).

Pin sides over the top view from the rear of the landing gear plate to the tail post. Slide each former down in its place and pin. Use a 90° triangle to make sure sides are square to the work surface. The cyanoacrylate glues come in handy right here. After the formers are glued in place, the top 1/8 x 1/4 longerons are glued into their cutouts. Pull in the top 1/8-in. of the sides where the



Thin 1/64 ply pieces FC and RC are glued on with epoxy to form the cowl shape. Two layers of FC are applied.

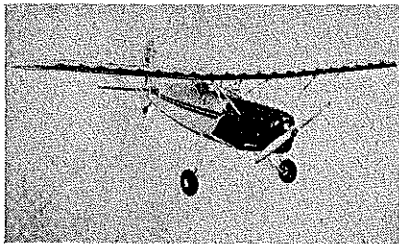


A good sanding job will give this kind of appearance. The nose block and ply cowl sides fair in nicely with the cowling top.

What are you doing this winter?

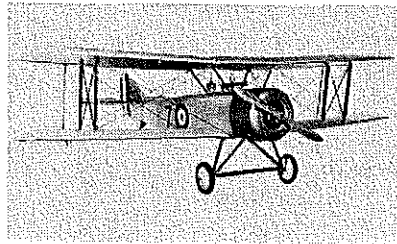
If the prospect of a long cold winter has got you down, let an OrLine R/C kit take the chill off. OrLine's classic World War One biplanes are a favorite winter building project for novice and expert alike. The new 1/4 scale Fairchild 22 is sure to provide you with plenty of excitement as its graceful lines begin to take shape on your workbench. You can bring back the romance of Immelmans and dogfights all winter long, with two airplanes that will never go out of style, the Sopwith Pup and Fokker DVII. Do something this winter.

Warm up to an OrLine.



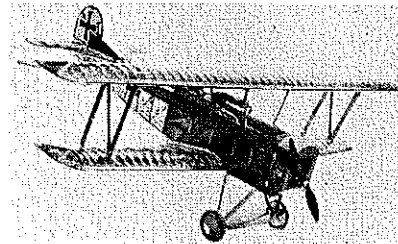
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ever, we had saved over three dozen Joe Ott kits. The kits included mahogany and cardboard sheet parts (WW II shortages), basswood strips, tissue, and glue. The kits may have been dated 1940-1944.

"We built one and sold several to America's Hobby Center. Still have eight on hand: Wildcat, Mustang, Spitfire, Brewster, Dauntless, Stuka, etc. The boxes are a bit tattered, and I can't swear the glue is as good as Super Jet. If there are any old-timer fans who are interested, we would part with a couple, but would be happy to donate a couple to the AMA Museum."

For heaven's sake, guys, don't write of Bill. Keith's address: Box 135 Division St., RD No. 2, Galway, NY 12074. We doubt he'll be able to answer everyone, but where's your sporting blood?

Correction. In a recent column we spoke of flying the Cessna 120 with flaps. Many owners and pilots chide us politely that it had to be a 140. Both were basically similar, although the electrics and other stuff were improved on the 140, and flaps were added. We do remember having two bad mags on a 120 on a cross-country, so we buy that electric bit. I had confused the numbers, having also flown the four-place 170—which flies better than its trike descendants—which I assumed to be the 140. Memory plays tricks!

I also had slight time (no takeoffs and landings) on both the immortal Airmaster (prewar vintage) and the 195, an impressive hunk of machinery. All my friendly critics agree the flaps on the 140 did next to nothing. And as to Bob Benjamin's search for authentic Aeronca K plans, I've been swamped with advice—do know from Bob Lopshire that Bob

Karlsson has one for local use (real plane nearby, too). Karlsson is a noted Scale man, and if you meet him at a contest, you might beg him on bended knees.

Bill Winter, 4426 Altura Ct., Fairfax, VA 22030.

Laser Model/Shepherd

Continued from page 30

shown on the side view. Pin top sides in place at formers F3A and F5A. Slip former F-4 in place, and 'eyeball' the top to see that it is square and straight, then glue the sides to the formers. Glue 3/32 sheet from F-4 forward for a cockpit floor. Glue the 1/8 x 1/4 top longerons to F-4 and F-5. Glue F5B in place. Glue the TSF side fairings in place. Glue the 1/8-in. side sheets to F-4 and F5A.

Remove cabin section, and glue the 1/8-in. doublers to the inside of the side sheets between F-4, F5A and the 1/8 x 1/4 top longerons. Glue 1/2-in. sheet over the turtledeck 1/8-in. behind former F-5. Glue the 1/8 ply tab to the 1/2-in. top sheet and the 1/2-in. forward block over the fuel tank. Glue the 1/2-in. sheet over cabin section. Mark the center of the forward and rear 1/2-in. blocks on the cabin section; drill 1/4-in. holes on these marks for the dowels. Cut the dowels to length and Hot Stuff them to the top blocks.

Place cabin section back on wing. Pin it down, and drill holes for the 4-40 FH bolts through the middle of the dowels. Remove the cabin section, and install the 4-40 blind nuts under ply tabs. Taper the top of the holes in dowels, and screw on the cabin section.

Cut former F-1 from 1/8 Lite Ply. Mark center

Continued on page 116

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READY-TO-FLY .40 to .61 ENGINE

FB 100

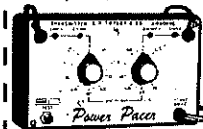
57" SPAN

Reg. \$159.95

SPECIAL \$139.95

+ \$6.50 Ship

Fully Built & Painted with Controls, Fuel Tank, L.G. & Wheels installed. Needs only Engine and Radio installation.



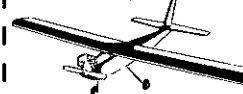
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POWER PACER

R/C Battery Tester. Charges & Cycles Tx & Rx batteries. Locates bad cells & provides batt. capacity readings.

CRAFT-AIR



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COWBOY TRAINER

57" SHIP SPAN \$6.50

SPEC. \$32.47

Kit available with flat-bottom or semi-symmetrical wing. 2 to 4 Ch. .19 to .40 Engine

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4-1/2% Surcharge for Visa or Master Card.



Gemini MTS*

*multitask sailplane

Standard Class R/C sailplane for Sport, F3B, and AMA contests

\$99.95

SPECIFICATIONS:

Wing span 100 in.
Wing area 930 sq. in.
Flying weight 44 oz.
Wing loading 6.8 oz./sq ft.
Wing section MB 253515
(15% semi-symmetrical)

Pierce Aero Company

9626 Jellico Ave., Northridge, CA 91325
(213) 349-4758

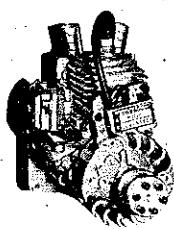
38 mi. flight by Jerry Krainock set 4 new Standard Class records
Alex Bower flew 26.1 sec. F3B 4-lap speed run w/ 3½ lbs. ballast

FEATURES:

Full flying stabilizer
Wide speed range
Complete hardware
Canopy
Rolled plans
Precision cut parts,
no die cutting
Strong enough for
zoom launch on 12
volt winch
Ballast area large
enough for 4 lbs.

MAGNUM II

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Smooth, powerful, easy starting,
light and reliable. Backed by
Homelites 1 year limited warranty.
Engines come complete with
mount, choke, Tatone muffler and
precision 6 bolt hub.
Nothing comes close.



SPECIFICATIONS:

2.5 cu. in.
Engine weight 4 lb. 6 oz.
Solid state ignition
Roller bearing at flywheel
Ball bearing at rear
Hemi-head chamber
Schneurlie ported
2 pc. con rod—bearings
Chrome plated cylinder
Magnesium case
Balanced crank
Pyramid reed intake
Built-in choke
Height: 7.25"
Width: Shaft center to
widest point: 3.0"
Total Width: 5.25"
Mounting plate to prop: 6.0"

\$279.00 retail

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He'll order it if not in stock.

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lines on it and on the front blocks. Line up F-1, and glue it in place. Cut the canopy from a Sig 16 universal stock canopy. Place the canopy in position on the cabin section, and mark around it on the top ½-in. sheet. Cut a female pattern of F-4 as shown on the plans, and use this to shape the turtledeck directly behind the canopy. Roughly cut out the cockpit from the ½-in. top sheet. Shape the turtledeck first with a knife and then with 100-grit paper on a block. Now, place the canopy on the cabin; carve and sand until you have a good fit. Trim out the cockpit until there is about ¼-in. all around the inside of the canopy. Remove the cabin section, unbolt the wing, then bolt the cabin section back on.

Glue the ½ x ¼ vertical strip to the front edge of BSF. Refer to the side view, and measure the cowl outline; mark the fuselage sides where these outlines are. Cut and glue ¼-in. triangle stock inside these lines, with the wide side glued to the fuselage. Note cross sections of F-2 and F-3. Cut C-1 and C-2 pieces from ⅛ ply and glue in place. Cut the side away from F-1 and C-1 for air venting, and taper the ½ x ¼ strip. Fair the ¼-in. triangle into the formers. Note the bottom of the cowl on section F-3. Cut four cowl pieces (FC) from ⅛ ply (this section of the cowl is doubled).

Check-fit the cowl by pinning in place over F-1, halfway over C-2, and totally covering the ¼-in. triangle outline. Trim where necessary for a good, snug fit. Epoxy the fuselage sides inside the cowl to fuel-proof it. Epoxy the inside of cowl FC, put in place, and pin all around. Don't put both C-1s on the engine side yet, as one of them will be glued to the inside of the cowl after it is cut off.

Cut the two RC pieces from ⅛ ply. Check-fit them, and trim where needed. Epoxy the inside of them, and glue in place over C-2, the ¼-in. triangle, and the vertical ½ x ¼. Epoxy the inside of the other FC pieces, and put them over the FC pieces already glued to the fuselage. Use rubberbands around fuselage to help hold them snug to the existing cowl, and pin all around the edges. When the cowl has dried, sand the FC pieces square with F-1. Rough-cut the ¾-in. nose block, and glue the F-1.

Using 100-grit paper on a block, carefully sand the top and bottom blocks and the nose to shape, fairing them in smoothly to the ply cowl. Take a one-inch block a little larger than the cowl bump, and cut one side at an angle (see Step 1 on the fuselage drawing), then cut the outline to rough shape (Step 2). Using a piece of 80-grit paper wrapped around a 4-oz. dope bottle or a similar-sized cylinder, carefully sand the inside, and continue trial-fitting to the ply cowl (Step 3). When a good fit is obtained, cut and sand the outside to rough shape (Step 4), then glue in position as per the side view of fuselage. Sand the bumps until they fair smoothly into the cowling. Any imper-

fections in the bumps can be smoothed with putty before covering and finishing. Using a Zona Saw, cut the cowl at the cabin section separation and remove cabin.

Tail surfaces. Cut a ¼-in. slot in the turtledeck top block where the forward fin goes, using a straightedge to line it up with the fuselage center line. Bolt on the wing, and fit the stab in the slot on the turtledeck sides. Line up the stab parallel with the wing in rear view and square with the fuselage in top view. Glue the stab in place, and then glue the fin—using 90° angles made from scrap balsa to keep the fin square with stab and wing while drying.

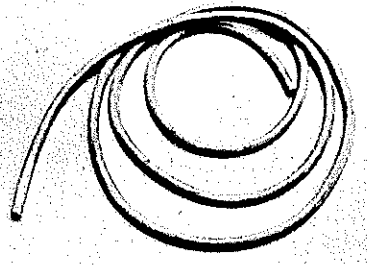
The elevator connecting bar is made from ⅜-in. brass tubing and ⅜-in. music wire. Solder the music wire into holes in the tubing. Recess the elevators where the tubing goes. Pin the elevators down to the workbench the proper distance apart and butting against a straightedge. Fit the bar to the elevators, and mark the places where the music wire enters the elevator. Drill holes in the elevators, then pin back down making sure they are even. Epoxy the bar in place. I always cut the slots and fit the hinges to the surfaces before finishing is put on the model (this can be done now). The hinges will be glued in after the model is completely finished.

Detailing. A Williams Bros. 2½-in. sport pilot was used with a few modifications to try to make it look like Leo Loudenslager. The point of the nose was sanded off slightly; talc and dope was mixed to a stiff putty to modify the hair. This mixture will soften the plastic, so be careful if you do this (it takes about two days to harden again). I globbed the mixture on the head using some photos of Leo as a guide. When this was dry, a coping saw blade was raked across the putty to simulate hair, then I painted the hair with yellow Pactra 'Namel, followed by a mixture of flat brown and yellow to lighten the brown. After all this was dry, the saw blade was used again to simulate strands of hair. It takes a little 'fiddlin,' but the results are pretty good. The shirt was painted flat red. When Leo saw the pilot figure in Sherman; he laughed and Jim Roberts said it looked just like him—so I guess it's close enough for Sport Scale.

The inside of the cockpit is sanded smooth. The ⅜ sheet instrument panel is glued in place, and the cockpit is painted. Glue a block of balsa to the bottom of the pilot figure, and trim it to the shape of the pilot. Place the pilot in the cockpit, and trim the bottom block until the head just clears the canopy. Paint the block red to match the pilot's shirt, and glue it in. Glue on the canopy, being careful not to smear glue on it. Mask off the canopy to keep it clean while finishing the model.

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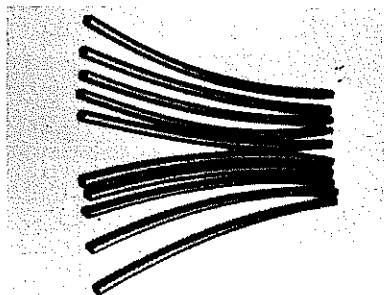
MODEL ENGINE FUEL LINE
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Part No. 200-249 \$ 1.49

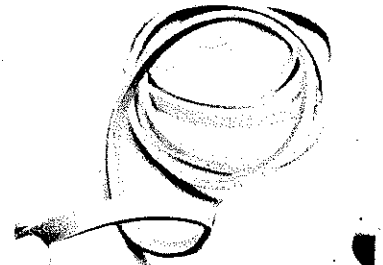
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Ideal sleeving for plugs and connectors. Shrinkable by using your soldering iron or cigarette lighter.

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Mark off the portion of the front cowl that is removable over the engine. Use a Zona Saw with the back removed to cut this portion away. Glue the 1/4 ply hold-down tabs in place. Drill 1/4-in. holes in the cowling for the dowels, and glue in the dowels with Hot Stuff. Drill through the dowels and ply tabs, then mount blind nuts under the tabs. Glue the other C-1 inside the cowl flush with the rear edge as shown on the top view.

Make the smoker valve as shown on the drawing, or buy a commercial valve. Mount it on plywood, and epoxy it to the inside of the cowl as per the top view. A combination smoke chamber, tail pipe, and muffler is fabricated from light steel tubing, 1/8-in. soft brass tubing, and a 12-gauge sheet metal flange. It is stuffed with steel wool and capped with 26-gauge sheet with holes drilled in it.

In order to have enough heat to vaporize the fluid, it's necessary to insulate the whole chamber with six or seven wrapped thicknesses of light fiberglass cloth. Make covers for the insulation from a tin can. Bend the sheet metal over the fiberglass, and solder the edges, holding in place with twisted wire until the solder hardens. This generator works very nicely when using Texaco 'almag' fluid; the smoke is dense, and it has good 'hang time.' Cover the engine mount bolts with short pieces of fuel tubing, and brush slow-driving epoxy all inside the engine compartment to fuel-proof it.

The model presented here has a doped finish. Silk was used on the bottom half of the fuselage and all of the wing. The remainder of the model was covered with lightweight silkspan. Aerogloss metallic blue is very close to the color of Leo's Laser. Yellow trim was used, adding white until the correct shade was attained to match the decals.

The best way I found to match the decal color was to cut out the 1/16-in.-wide LASER 200 decal, and attach it to the blue-doped wheel pants in

the proper place—then I kept experimenting with the yellow until it matched the decal color. A dab of blue may have to be added to the yellow for a really good match.

The star sizes are shown on the fuselage drawing. The fuselage stars were masked off and doped white. A pattern of the wing stars was made from 1/16 ply, and the stars were cut from a Sig white decal sheet. The decals that come with the plans are given two coats of clear polyurethane after they have dried thoroughly.

The tail feather bracing is made from .045 music wire with #26 solder lugs soldered to the ends and held with 2-56 bolts. The simulated rib stitching on the fin, rudder, stab, elevators, and ailerons is made from Manila paper file folder material; a pizza cutter is rolled over it at about 1/16-in. intervals to indent it, then it is cut into 1/32-in. strips and doped to the surfaces. The effect is good at 15 feet.

Most folks have their own favorite way of installing the radio gear. Mine is shown on the plans. My ship balanced on the CG shown without adding any weight.

If you build this bird, I believe it will give you many hours of truly enjoyable aerobatic flying. If you go the full route with detailing, it will be competitive with other Sport Scale models at the various meets. See you there!

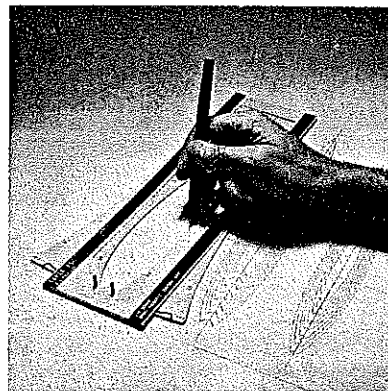
Nats General

Continued from page 33

competition with some events (such as RC Pattern) running for five consecutive days. Not even World Championships involve as much as a Nats—in number of people, days, or hours.

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