the CAP

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Brad Shepherd

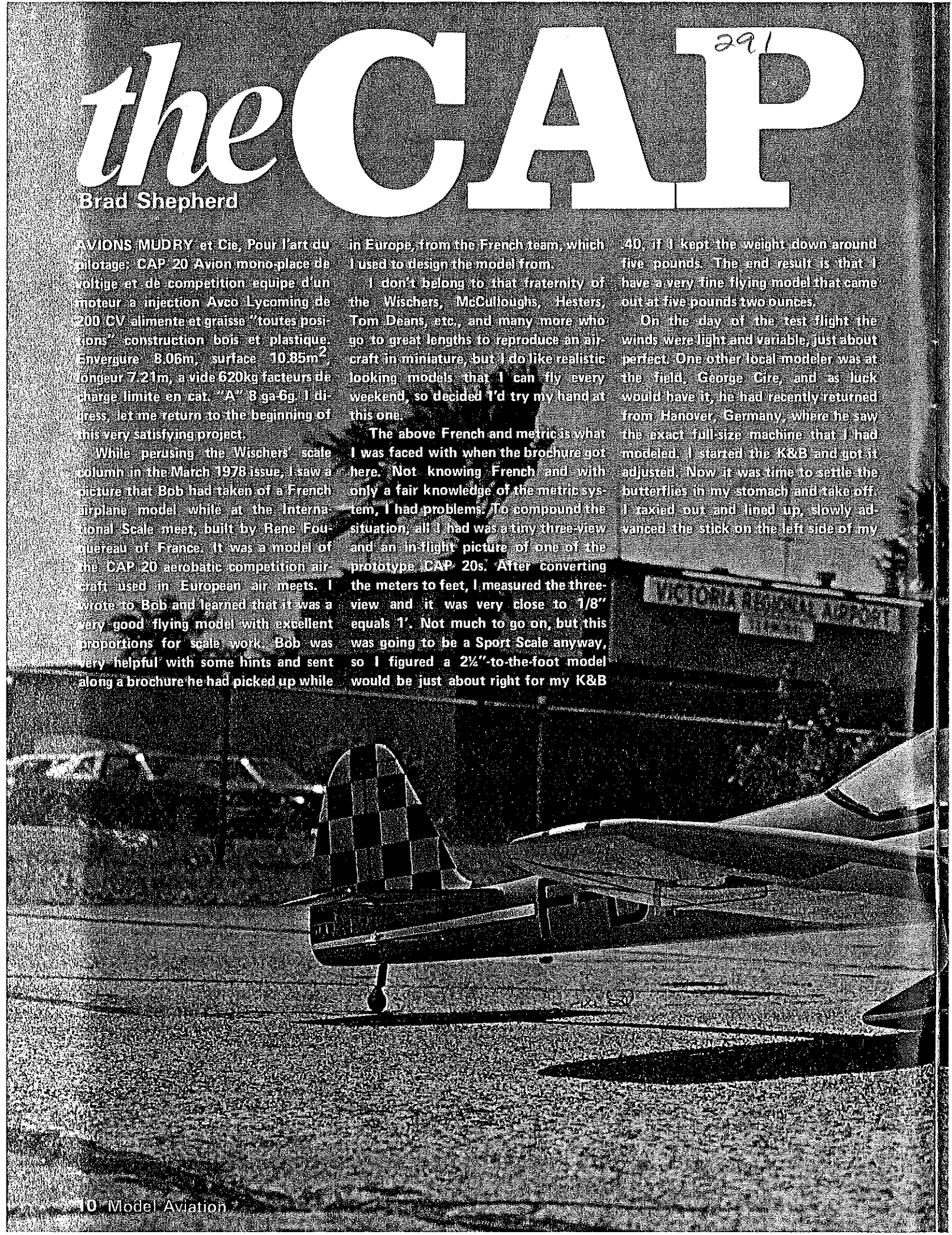
AVIONS MUDRY et Cie, Pour l'art du pilotage: CAP 20 Avion mono-place de voltige et de competition equipe d'un moteur a injection Avco Lycoming de 200 CV alimente et graisse "toutes positions" construction bois et plastique. Envergure 8.06m, surface 10.85m^2, longeur 7.21m, a vide 620kg facteurs de charge limite en cat. "A" 8 ga-6g. I digress, let me return to the beginning of this very satisfying project.

While perusing the Wischers' scale column in the March 1978 issue, I saw a picture that Bob had taken of a French airplane model while at the International Scale meet, built by Rene Fouquereau of France. It was a model of the CAP 20 aerobatic competition aircraft used in European air meets. I wrote to Bob and learned that it was a very good flying model with excellent proportions for scale work. Bob was very helpful with some hints and sent along a brochure he had picked up while in Europe, from the French team, which I used to design the model from.

I don't belong to that fraternity of the Wischers, McCulloughs, Hesters, Tom Deans, etc., and many more who go to great lengths to reproduce an aircraft in miniature, but I do like realistic looking models that I can fly every weekend, so decided I'd try my hand at this one.

The above French and metrics as what I was faced with when the brochure got here. Not knowing French and with only a fair knowledge of the metric system, I had problems. To compound the situation, all I had was a tiny three-view and an in-flight picture of one of the prototype CAP 20s. After converting the meters to feet, I measured the three-view and it was very close to 1/8" equals 1'. Not much to go on, but this was going to be a Sport Scale anyway, so I figured a 2¼"-to-the-foot model would be just about right for my K&B 40, if I kept the weight down around five pounds. The end result is that I have a very fine flying model that came out at five pounds two ounces.

On the day of the test flight the winds were light and variable, just about perfect. One other local modeler was at the field, George Cire, and as luck would have it, he had recently returned from Hanover, Germany, where he saw the exact full-size machine that I had modeled. I started the K&B and got it adjusted. Now it was time to settle the butterflies in my stomach and take off. I taxied out and lined up, slowly advanced the stick on the left side of my



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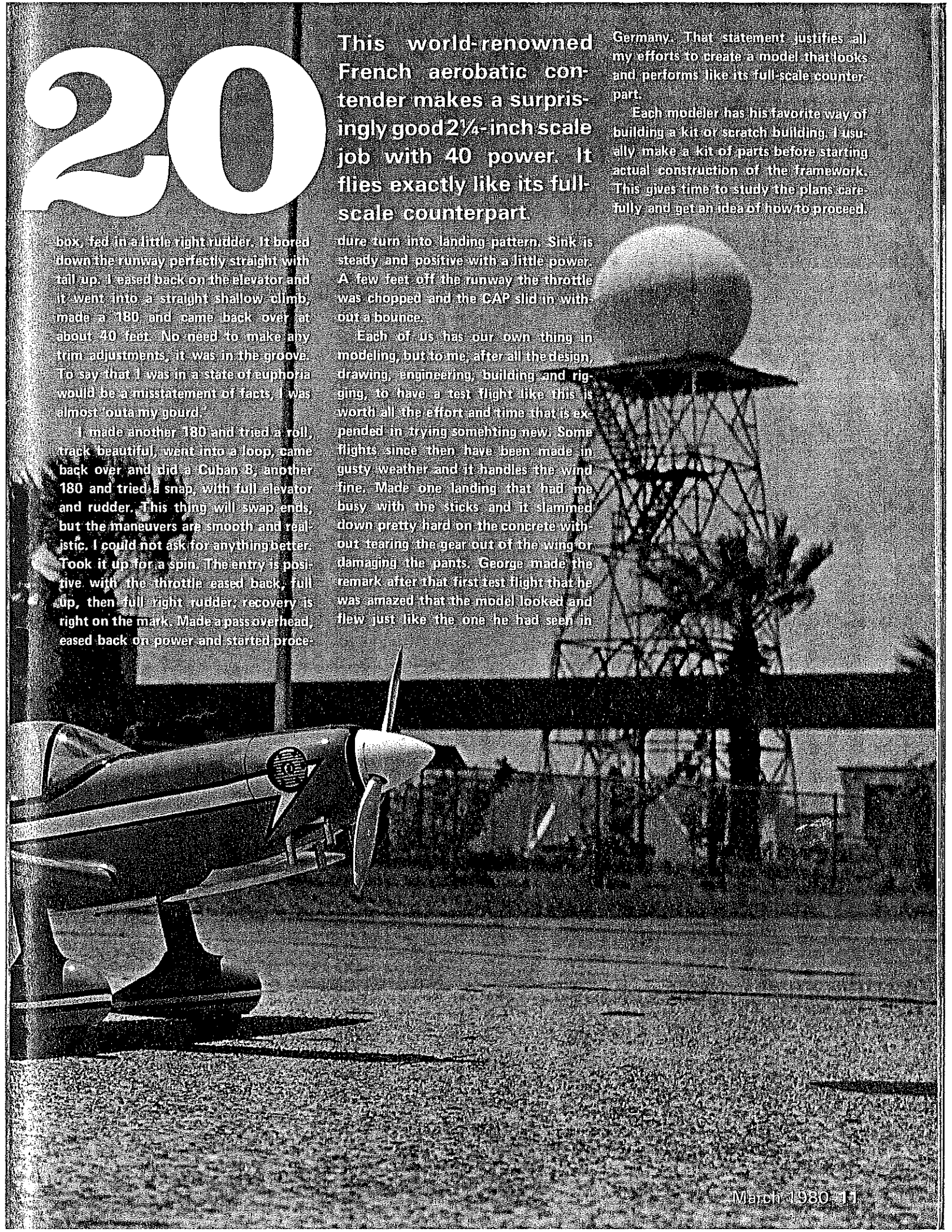
This world-renowned French aerobatic contender makes a surprisingly good 2¼-inch scale job with 40 power. It flies exactly like its full-scale counterpart.

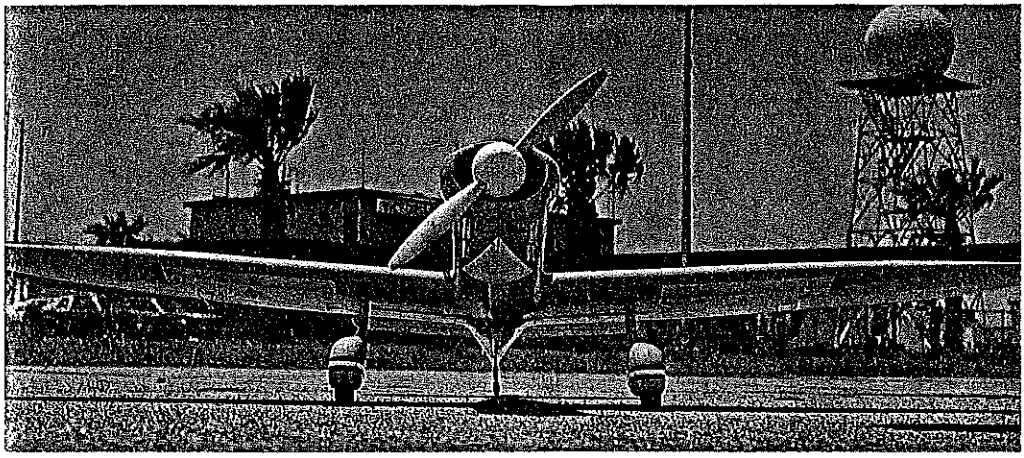
box, fed in a little right rudder. It bored down the runway perfectly straight with tail up. I eased back on the elevator and it went into a straight shallow climb, made a 180 and came back over at about 40 feet. No need to make any trim adjustments, it was in the groove. To say that I was in a state of euphoria would be a misstatement of facts, I was almost 'outa my gourd.'

I made another 180 and tried a roll, track beautiful, went into a loop, came back over and did a Cuban 8, another 180 and tried a snap, with full elevator and rudder. This thing will swap ends, but the maneuvers are smooth and realistic. I could not ask for anything better. Took it up for a spin. The entry is positive with the throttle eased back, full up, then full right rudder, recovery is right on the mark. Made a pass overhead, eased back on power and started procedure turn into landing pattern. Sink is steady and positive with a little power. A few feet off the runway the throttle was chopped and the CAP slid in without a bounce.

Each of us has our own thing in modeling, but to me, after all the design, drawing, engineering, building and rigging, to have a test flight like this is worth all the effort and time that is expended in trying something new. Some flights since then have been made in gusty weather and it handles the wind fine. Made one landing that had me busy with the sticks and it slammed down pretty hard on the concrete without tearing the gear out of the wing or damaging the pants. George made the remark after that first test flight that he was amazed that the model looked and flew just like the one he had seen in Germany. That statement justifies all my efforts to create a model that looks and performs like its full-scale counterpart.

Each modeler has his favorite way of building a kit or scratch building. I usually make a kit of parts before starting actual construction of the framework. This gives time to study the plans carefully and get an idea of how to proceed.

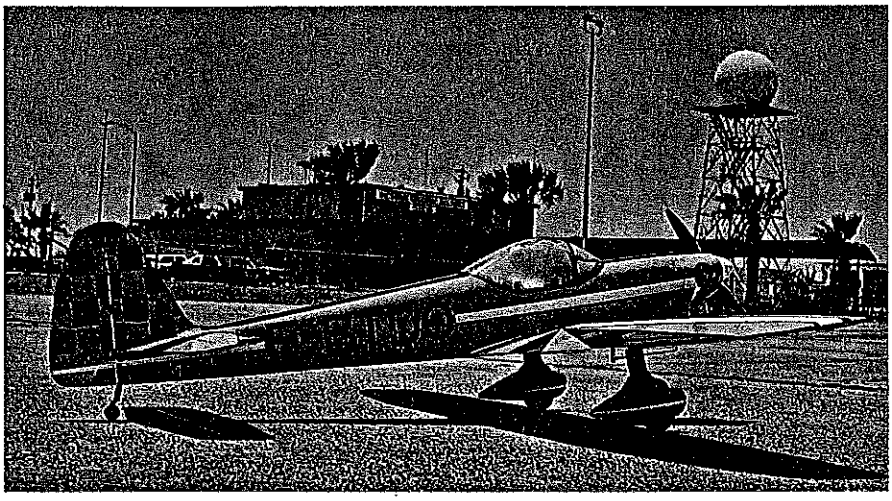




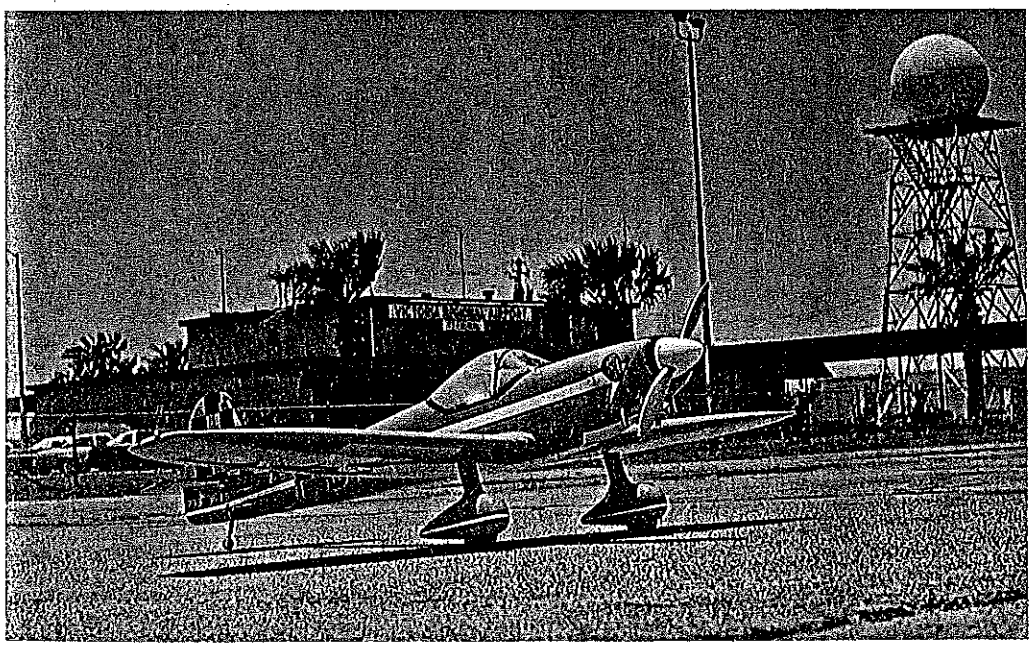
The impressive color shots which show the little CAP to such advantage were taken by Leon Folse in front of the ramp at Victoria Regional Airport. Leon, a long-time model designer turned photographer, used a Mamiya 645, 80-mm f/2.8 lens, with Ektachrome 64 film.

(Read the notes I have here on construction while spending some time looking over the plans.) One aim was to keep the construction as simple and straightforward as possible, using common building techniques. The wing was a little tricky designing but I think you'll agree that it works out very well while constructing. No particular sequence is needed, so the wing, tail surfaces, and fuselage can all be worked on simultaneously if your work area is large enough.

Make patterns of all the ribs but the elevator ribs. The tabs are on them for accurate jig building. This may seem like a lot of work but it pays off in a straight, strong, light structure. Cut the spars from the same piece of straight medium balsa. Cut the L.E. and T.E. ⅛ sheet jigs from straight-grained medium balsa. I used a Ridgeway #33 ships curve to get the shape of the spar. It can be done without this by drawing a center line on the spar sheet, marking the depth at each rib station. Then, using a piece of ⅛ x ¼, bend it around the marks, pin down, then draw the outline with a ball-point. The trueness of the wing depends on the L.E. and T.E. ⅛ sheets being accurate, so be careful when cutting them out. Cut the wing ribs from medium/light 3/32 sheet. Fit each rib to its slot in the spar and trim where necessary to get a flush fit with the spar.



From a low three-quarter rear view, the CAP appears to have a fairly long tail moment, which makes it less squirrelly than many other scale renditions of world-class aerobatic airplanes.



How well does it fly? On its first test it was right on, no trim required. After a perfect take-off and climb out, Brad put it through a precisely tracked roll, loop, snap, Cuban 8, and another snap. Then a spin, recovery on the mark, a faultless approach and no-bounce landing.

Pin the spar over the plans using a 90° triangle to get the setting-up straight. Pin the L.E. and T.E. sheets in place. Check-fit the ribs and trim if necessary for a snug fit. Glue each rib in place. Fit the L.E. 3/32 sheeting, laying the edge of it over the center of the spar and the end of it over the center of #1 rib. Trim the corner of the 3"-wide T.E. sheet to fit the ⅛ jig and #1 rib. Glue in place, pinning firmly to the ribs to conform to the elliptical shape of the panel. Fit and glue the other two sheets to the top of the panel and let dry overnight. Unpin the structure and turn over, pinning down firmly to the bench.

At this time, sheet only the leading edge between the inside W2 rib and the tip to allow for installation of the landing gear structure later on. Glue the 3/32 x 1½ trailing-edge sheeting in place after fitting to the T.E. ⅛ jig. Fill in the area between the two W2 ribs with 3/32 sheet. Fit the aileron crank to the ⅛ Lite Ply mount with the slot cut out then glue in place on W3 and W4 ribs. Glue on the cap strips. Sheet the area from #7 rib to tip with 3/32, also the center section sheet from the ⅛ T.E. to the spar. Glue the ⅛ gussets in place as shown on the plans and allow the panel to dry well before lifting it off the board. Unpin the panel and trim the ⅛ L.E. and T.E. pieces flush with the 3/32 sheeting on top and bottom.

To assemble the two panels, a long straight surface is required. I use an inside panel door from the lumberyard for this. These doors are reasonably inexpensive, flat, and pins can be stuck in them readily. Lay out a straight center line on the door; at about the middle of this, draw two lines, 90° from this CL and 4 inches apart. Then draw two lines, each 24 inches from the two previous lines, and 90° off the center line. Pin the root rib jigs over the inside lines with the mark directly over the CL. Pin the #7 jigs over the outer marks with the line-up mark directly over the CL. Lay the two panels on these jigs with the bottom of the wing up, then trim the spar ends to make a good fit.

When the two panels fit the jigs well and the spars fit, pin the panels firmly down to the jigs. Check-fit the dihedral brace DB 1; when good, epoxy it in place. Use epoxy on all ply and hardwood joints. Glue the DB 2s in place. Glue the WP 1 and WP 2 sub-ribs in place. Glue the DB 3s in place. Check-fit the grooved block and trim if needed. Glue in place. Glue LGB in place, then the vertical grooved block. Glue DBL and DBT to the leading and trailing edges. Glue PP2 to the WP 2s and DBL. Sheet the center section between the root ribs and let all dry thoroughly.

The stabilizer and vertical fin are built in the same manner as the wing panels, using 1/16 sheet instead of 3/32. When building the elevators, pin the ¼ x 9/16 L.E. over the plans, pin the 3/16 T.E. in place, then glue 1/16 sheet between these. Glue the ribs onto the sheet, then glue the top 1/16 sheet in place. When dry, remove and sand the T.E. to shape. When installing the elevator joiner and horn assembly, pin the stab to bench, line up the elevator halves in place and pin down, then mark where the horn wires will go into the elevators. Drill out and relieve the L.E. a

little and epoxy in place.

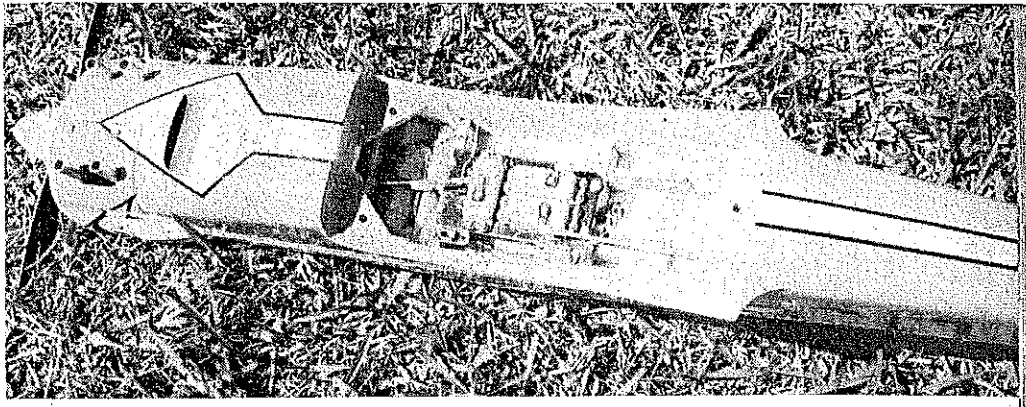
Before removing the wing from the jigs, sheet the bottom section between root rib and W2 at the leading edge. When dry, remove wing from jigs, sand tip sheeting square, and glue ½" tip blocks in place. Cut ailerons from light ¼ sheet. Tack glue them in place on the T.E. ⅛ sheet. Glue the ⅜ x ¾ trailing edge in place. Install the aileron pushrods. I used 1/16 music wire. Cut holes in each rib from the center section to the crank plate. Make a 90° bend in the wire, which is slipped into the crank hole. Leave the ends in the center section. Later, when the aileron servo is installed in the center section, zero the servo and use Du-Bro aileron ball-link joints soldered to the wire with the ailerons clamped in neutral. Works great.

Sand the wing to shape using a large block with 220 paper glued to it, or whatever commercial sander you have. Glue a ⅛ sheet strip on the L.E. wide enough to cover the ⅛ L.E. jig piece (about ¾" wide) and sand the leading edge to a well-rounded shape. Epoxy PP 1 to bottom of trailing edge and set the wing aside.

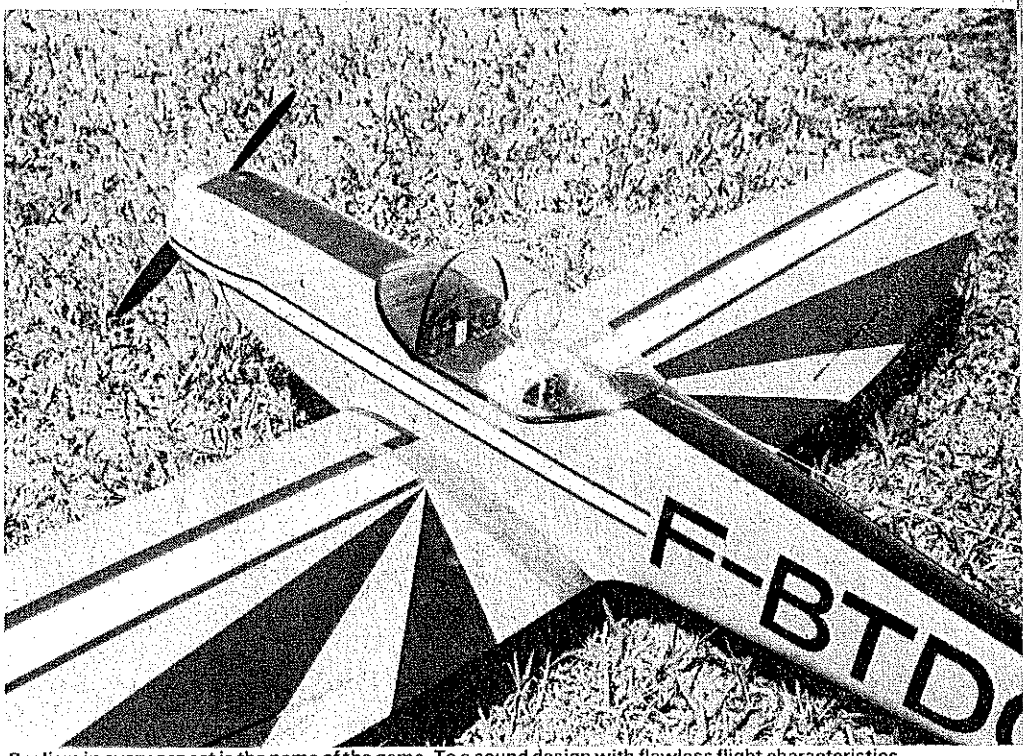
There are two ways to fabricate the fuselage sides. You can lay out a center line on the joined 3/32 sheet, measuring from this to draw all of the outline; or you can cut out the doubler, placing them on the sheet side, and drawing around them to finish the bottom to the tail post with a straight edge. When one side is cut out, lay out another. Glue the doublers in place, then the ¾ triangle longerons as shown on the isometric view on the plans. Glue the ¼ upright strengtheners to sides and the ¼ x ⅛ tail post to one of the sides. Refer to the top view and mark where the triangle pieces meet, then carve and sand the taper into them, checking the angle by holding the fuselage sides together over the top view. Sand until the sides conform to the drawing.

The bottom is straight from F4 to the tail post. Pin the sides down over the plans and use a clothes pin or clamp to hold the tail post together. Glue F4 in place. One note here, the fuselage can be assembled using Hot Stuff-type glue, but be sure you go over all the joints with epoxy when they are in place.

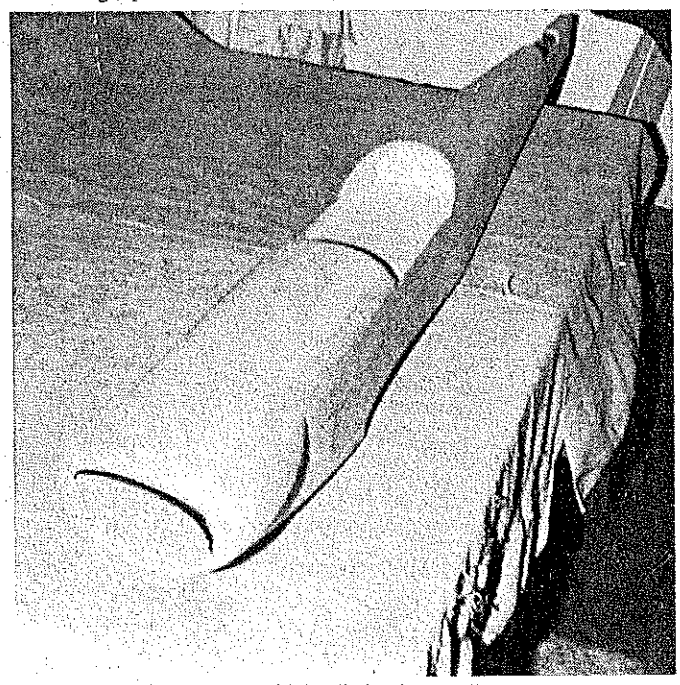
Unpin the fuselage from plans and rock forward; pin down at F3 and glue F3 in place, using 90° triangles to keep the structure square. Lay out the engine mount holes on the F2 firewall before installing. I put 6-32 screws through the firewall



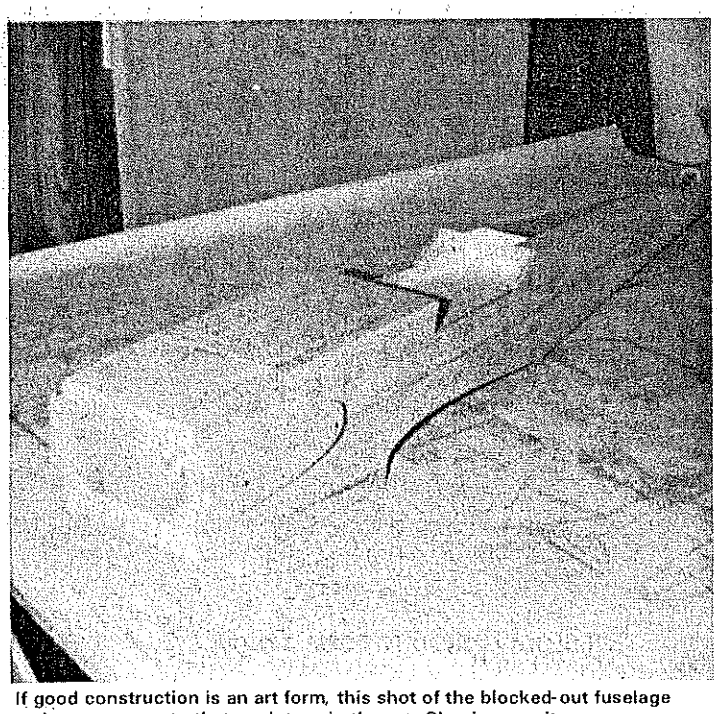
With workmanship like this, it comes as no surprise that the radio installation would look like something out of the radio manufacturer's instruction manual. Just as neat as can be.



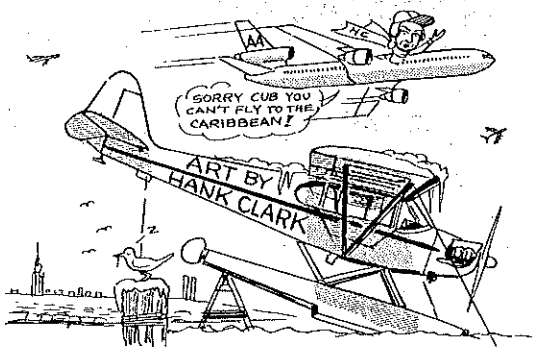
Realism in every aspect is the name of the game. To a sound design with flawless flight characteristics, add a dash of colorful true-to-life trim, an instrument panel, a pilot with earphones, and the result is something to turn you on. French license letters heighten illusion.



The roughed-out fuselage with its distinctive cowling actually is no more difficult to build than that of a typical pattern machine.



If good construction is an art form, this shot of the blocked-out fuselage and nose suggests that sculpture is the art. Shaping awaits.



BASIC BALSA BLOCK LAY UP FOR SANDING TO FUSELAGE FORM

ALL 1/2" BALSA

CUT LAST TO OPEN HALF COWL

TRIANGULAR STOCK IN FOUR CORNERS

(X)

1/2" BALSA COWL BUMP (2)

'T' NUTS ON 1/8" PLYWOOD PLATE

4-40 SCREWS (4) THRU 1/4" DOWELS DRILLED CLEAR

SIG CANOPY FOR ZL-N

DOUBLED 1/8" PLYWOOD

1/8" BALSA FUEL TANK SUPPORT

SERVO TRAY ON SUPPORT BLOCKS

PLYWOOD BLOCKS FOR WING BOLTS (2)

1/8" BALSA PILOT DECK

F5

F-1 1/8" PLYWOOD NOSE RING FORMER AND STIFFENER

PLY PLATE SUPPORTS 'EXHAUST PIPES'

3/8" BALSA LAMIN. TO FORM NOSE RING

K & B 40 FR MOTOR ON KRAFT ALUMINUM MOUNT

(X)
BLOCK IS ADDED ONLY TO FORM ROOF OF AIR DUCT

FINAL FORM OF COWL BLOCK (EXPLODED FOR ART ONLY)

THIS BLOCK CARVED TO FORM AIR DUCT (DITTO FOR ART)

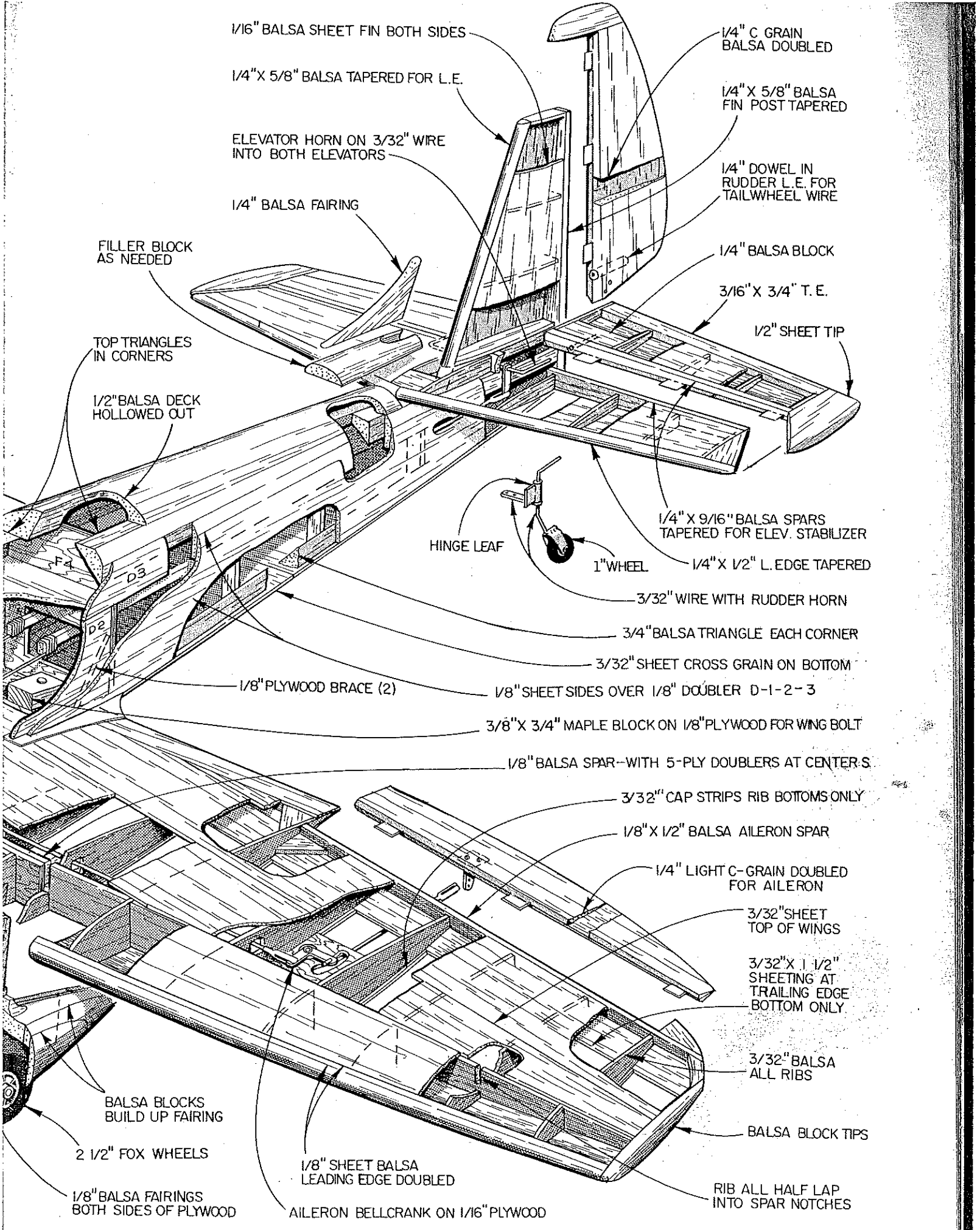
SIDE COWL BUMP FINAL FORM (DITTO)

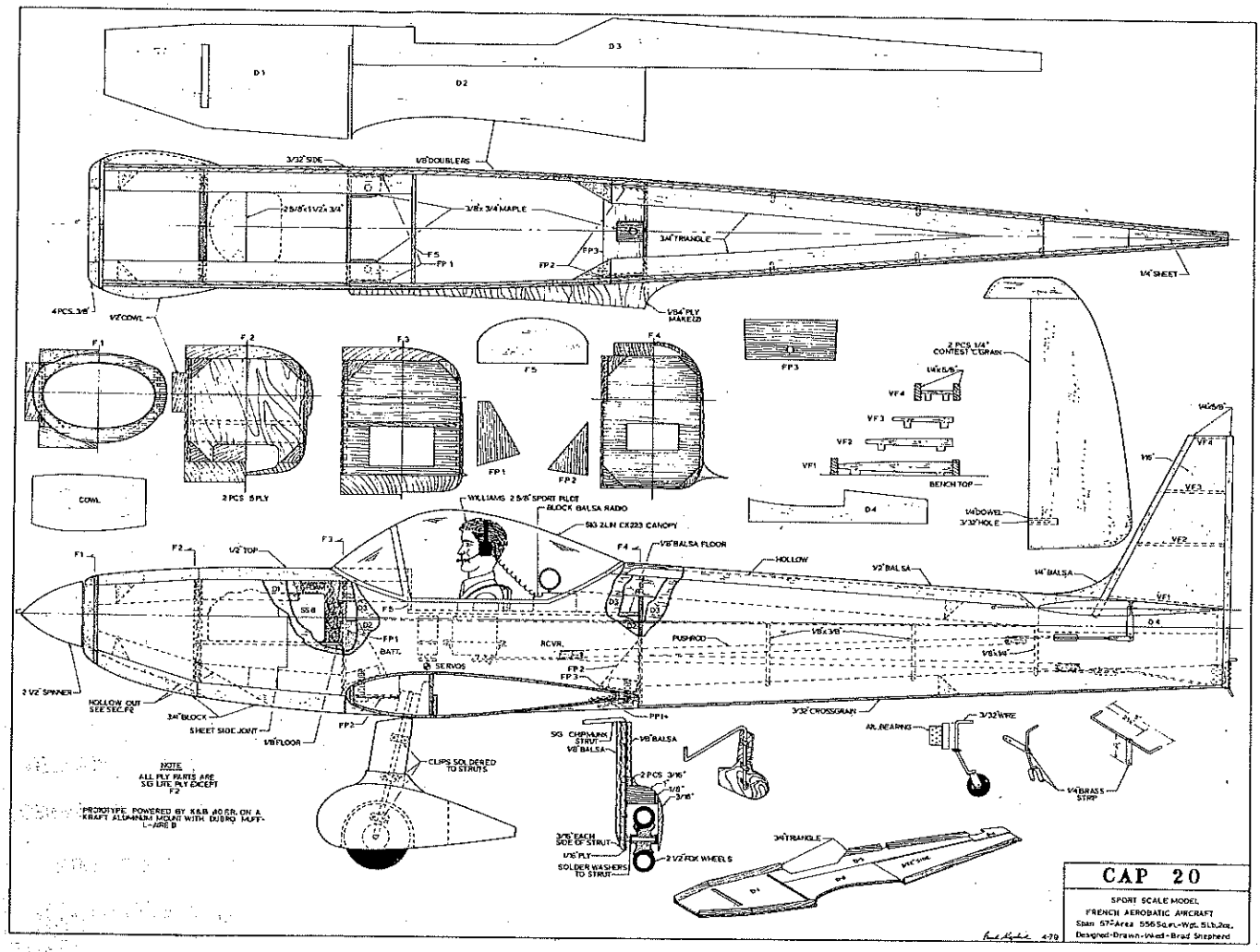
NYLON WING BOLT (3)

MAPLE BLOCK GROOVED UNDER FOR L. GEAR WIRE

L. GEAR WIRE IS STRAPPED TO PLYWOOD

3/16" DIA. WIRE STRUT HELD IN BY DUBRO STRAPS


1/16" BALSA SHEET FIN BOTH SIDES
1/4"X 5/8" BALSA TAPERED FOR L.E.
ELEVATOR HORN ON 3/32" WIRE INTO BOTH ELEVATORS
1/4" BALSA FAIRING
FILLER BLOCK AS NEEDED
TOP TRIANGLES IN CORNERS
1/2"BALSA DECK HOLLOWED OUT
1/4" C GRAIN BALSA DOUBLED
1/4"X 5/8" BALSA FIN POST TAPERED
1/4" DOWEL IN RUDDER L.E. FOR TAILWHEEL WIRE
1/4" BALSA BLOCK
3/16"X 3/4" T.E.
1/2" SHEET TIP
HINGE LEAF
1"WHEEL
1/4"X 9/16" BALSA SPARS TAPERED FOR ELEV. STABILIZER
1/4"X 1/2" L.EDGE TAPERED
3/32" WIRE WITH RUDDER HORN
3/4"BALSA TRIANGLE EACH CORNER
3/32" SHEET CROSS GRAIN ON BOTTOM
1/8" SHEET SIDES OVER 1/8" DOUBLER D-1-2-3
1/8"PLYWOOD BRACE (2)
3/8"X 3/4" MAPLE BLOCK ON 1/8"PLYWOOD FOR WING BOLT
1/8"BALSA SPAR-WITH 5-PLY DOUBLERS AT CENTER S
3/32" CAP STRIPS RIB BOTTOMS ONLY
1/8"X 1/2" BALSA AILERON SPAR
1/4" LIGHT C-GRAIN DOUBLED FOR AILERON
3/32"SHEET TOP OF WINGS
3/32"X 1 1/2" SHEETING AT TRAILING EDGE BOTTOM ONLY
3/32" BALSA ALL RIBS
BALSA BLOCK TIPS
RIB ALL HALF LAP INTO SPAR NOTCHES
BALSA BLOCKS BUILD UP FAIRING
2 1/2" FOX WHEELS
1/8"BALSA FAIRINGS BOTH SIDES OF PLYWOOD
1/8" SHEET BALSA LEADING EDGE DOUBLED
AILERON BELLCRANK ON 1/16" PLYWOOD
F4
D3
D2



from the back side. Solder a short piece of wire into the screw slots, then epoxy them to firewall with the mount in position on the front end. Glue the firewall in place.

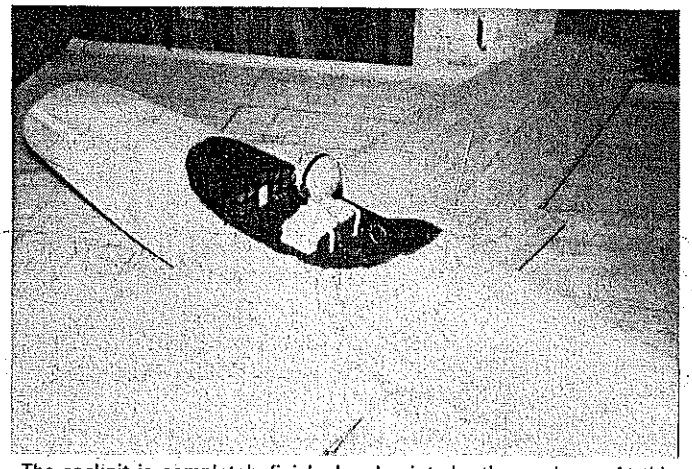
Glue the ⅛" tank floor in place and mount tank with outlets. Locate approximate position of throttle pushrod tubing, drill holes and install. Mark center and horizontal lines on F1 ply former and matching lines on fuselage. Glue top ½ sheet and bottom ¾ blocks in place. Sand the front end square and glue F1 in place. The cowl front end is made from two vertical and two horizontal pieces of ⅜ balsa glued to the front end of F1. Use a light piece of ½ sheet for the turtle deck and tack-glue it in place. Glue the ¼ filler piece between sides, aft of the stabilizer. Glue the bottom 3/32 sheet on cross-grained. Glue the ⅛ cockpit floor in, then glue F5 in place. Set this aside.

Glue the ½ sheet tips to the elevator and stabilizer. Cut the ½" cowl pieces to shape and glue on the sides butting against F1, noting the left side of the section drawings of F1 and F2 for location. Carve and rough sand the fuselage to approximate shape, referring to the right side of the section drawings. Cut ½ sheet from rear top off, hollow out and glue back on permanently.

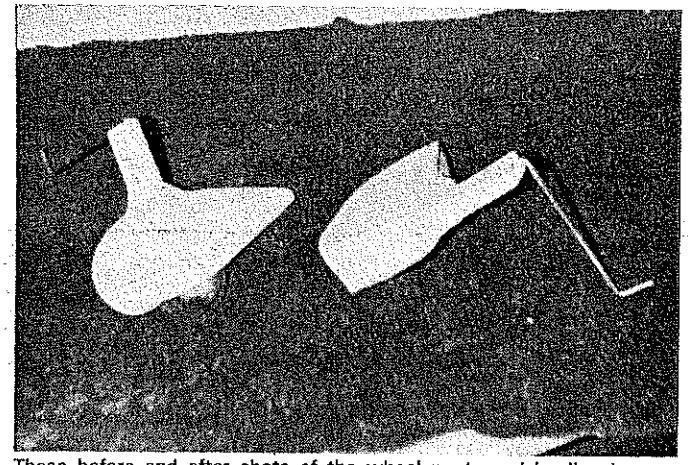
Using epoxy, glue the FP1 and FP2 pieces in place. Remember to recess the FP2 pieces ⅛". Glue FP3 and the hardwood blocks in place. I use Sig Kwik-set for this and it has held up OK on all my planes. Check-fit the wing in the fuselage and sand out any rough spots. Be careful not to sand too much and change the incidence of the wing. Cut out the two 1/64" fillet bases from a sheet of plywood. Draw center lines on the fuselage in front and rear of the wing cut out, and a center line on the bottom sheeting of the wing. Pin the wing in place and check its squareness by using a yardstick from the tail post to the wing tips, shifting it if necessary.

Drill the screw mounting holes through the wing ply plates and hardwood blocks in the fuselage, then tap the blocks and screw the wing in place. Check-fit the stabilizer in the cut-out and sand any rough spots off the saddle. Getting the stab on straight and level is very important if you want a true-flying model that tracks through maneuvers well, so take care in lining it up before gluing in place.

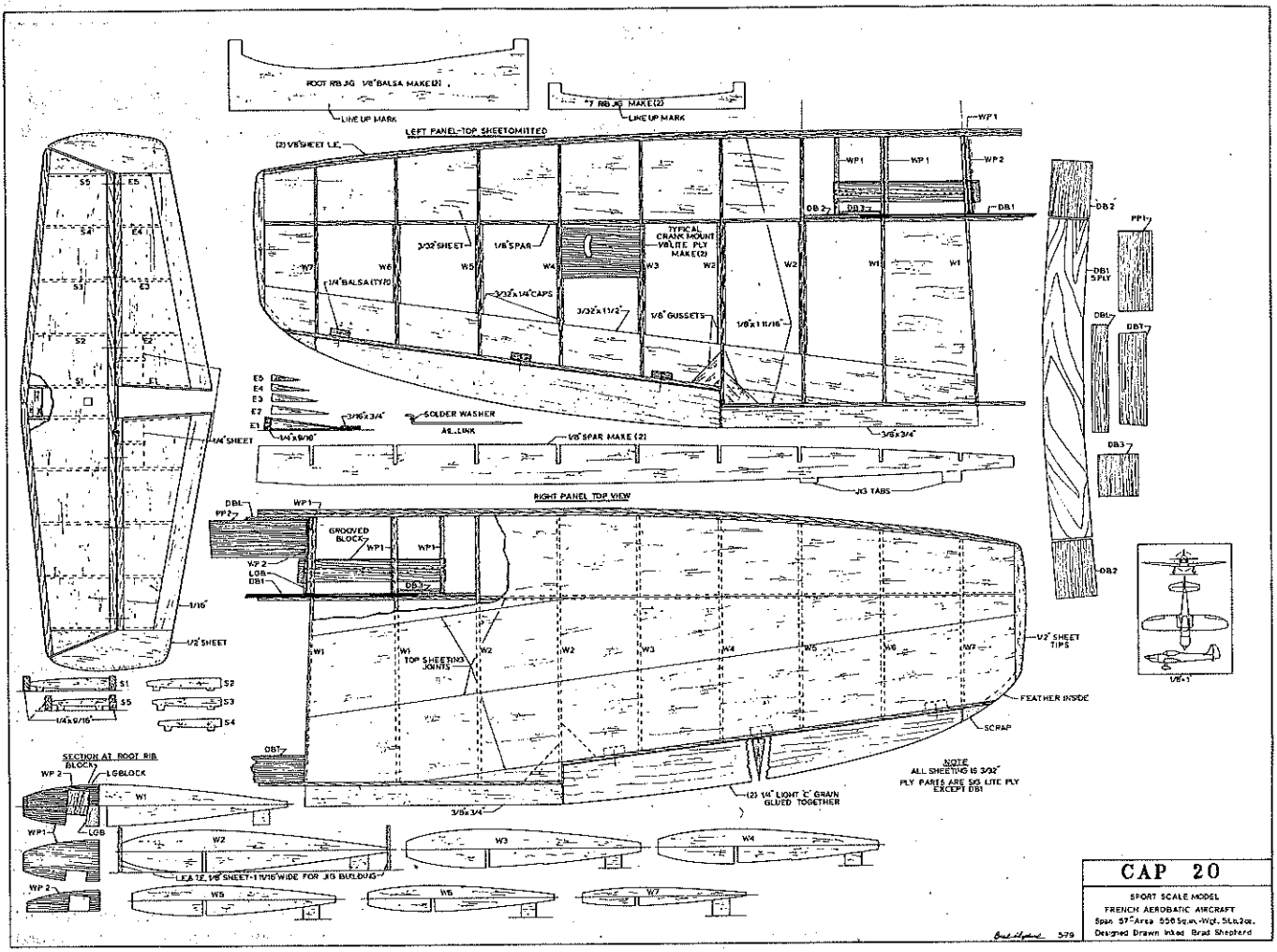
Unbolt the wing, position the 1/64" fillet



The cockpit is completely finished and painted rather early on. At this stage, the builder encounters a fun break in the construction.



These before and after shots of the wheel pants and landing legs—finished on the left—complement the plan details. Practical, we'd say.



bases, lay some Saran Wrap over the wing center section and bolt the wing back on. I use ¼" triangle balsa between the ply and fuselage sides, then putty the fillet in, using a finger to get it smooth. Glass beads, Sig Epoxilite or whatever your favorite material is can be used here.

Unbolt the wing. Start trimming a little at a time off the canopy until it fits around the fuselage. Carve the inside, top rear, of the cockpit to about 3/16" thickness and smooth with sandpaper. Sand the fuselage to final smooth shape with 220 grit. Bolt the wing back on and add the filler pieces to the leading and trailing edges to fair into the fuselage smoothly.

Go as far as you want in doing the inside of the cockpit. I put inside an instrument panel, pilot, pilot seat and radio, but this is not required for Sport Scale. I like some realism. Glue on canopy. The elevator has to be mounted before the vertical fin can be glued in place, and now is the time to fit and hinge it. Use 90° triangles when gluing fin in place.

The rudder is shaped and hinged, but not glued on as yet. Fabricate the tail-wheel drive and rudder horn, using the side view and isometric sketch. I used low-temperature silver solder for this job and it has never failed. Epoxy the tail wheel unit into the rear of fuselage. One change that can be made is to move the brass strip to the top of the drive unit, instead of the bottom. I was concerned with interference with the elevator, but this has proven untrue. It will make the pushrod installation easier if it is moved to the top.

Draw center lines on the top and bottom of the front blocks from the cowl edge to the firewall. Use a razor saw to cut the cowl from the fuselage. I pried the backing edge of an X-Acto #35 blade off and used the blade to do the job.

I use ⅛ ply tabs epoxied to the permanent side of the fuselage, inside the top and bottom blocks, jutting out far enough (about ½") to mount 4-40 blind nuts to the inside face of each. Two pieces of ¼ dowel were glued to the top and bottom (two

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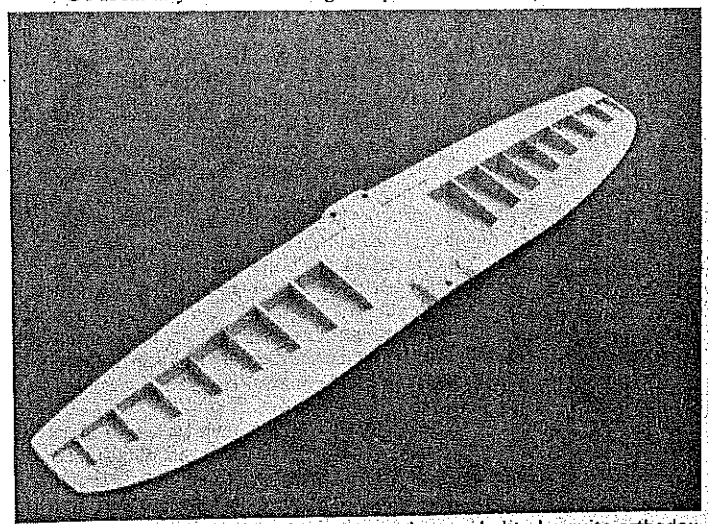

Seen from beneath, the wing structure is revealed to be quite orthodox. Gear recess slots and holes for the hold-on bolts show clearly.

A distinctive plan form and refreshing decorative scheme of the real aircraft add up to a pleasing sight during an overhead fly-by.

Dave Robelen, as a few of you well know, is yet another of that brilliant circle of modelers who made a career at NASA. It all began, simply and logically, before WW II when the old NACA—the space age converted those initials to NASA—hit upon the happy policy of hiring modelers to make wind tunnel models. There were many others, people like Taibi, Worth, Blanchard, Poythress, Phillips, who shared that unique experience. Many of them became involved with test work of a more exotic nature, both within the laboratory analysis of performance of future vehicles, and fringe-area machines, and development and flight testing of a strange array of aircraft, from drop testing of dynamically similar models of fighters and such, to strange configurations like the Rogallo wing.

Operating in the twilight zone of models and real aircraft, their scientific bent was dual, turning as well toward the advancement of the modeling forms that constituted their hobby—as distinguished from their jobs. Dave himself is no stranger to modeling's printed pages.

We'd frankly be astounded if any reader builds a spin tunnel such as Dave describes in his article this month. But we'd bet you'll read every word of it. We tend to forget that among the purposes defined when the AMA was founded in 1937, was the dissemination of information and the technical advancement of our art. So it is that one of the important functions of *Model Aviation* is the publication of scientific articles, and, as we said, this is the season when *MA*, like the desert, grows many flowers. For the next five or six months you find two or three of these bonus coverages in every issue.

People are the common denominator. While it would please us to bring you a personality or "profile" in every issue, it is within this free-wheeling season that we usually manage at least one such story. Personalities, when done in any magazine, too often tell, or retell, the stories of already famous, by now obvious, people. These usually turn out to be either glamorous manufacturers or guys whose flying has made them legendary. But all around us are remarkable people you seldom hear mentioned, the unsung heroes, self-effacing guys who skip almost unnoticed from one remarkable achievement to another. You'll appreciate that after reading Art Schmalz's long-labored-over story about Dave Gray. Dave happens to be with Du-Bro, but that is a coincidence. Du-Bro is not the story—nor do we plug that firm above others. It is simply, that among the "insiders," the quiet Dave Gray is recognized for his ingenuity and developments. He is one of the thinkers. We'd love to do others. Over a span of 15 years, we've been aware of this exceptional, quiet man and it pleases us to bring his story to you. Modeling is people as much as it is things. Robelen's account of his spin tunnel is about things. Schmalz's piece on Dave Gray is people. Both have a common theme: achievement. And that is what modeling is all about. There will be a lot more of it in the next issue, and the issue after that..., until the 1980 competition reaches its crescendo.

The best of two worlds!

CAP 20/Shepherd

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top and two bottom) over the location of the tabs which were about 1" from front and back. When these are dry, tape the cowl on tightly, and drill 3/32 holes through the middle of the dowel and through the tabs. Enlarge the tab holes to receive the blind nuts, screw the cowl on, secure the blind nuts in the holes. Remove the cowl and dab a little epoxy on the blind nuts, then countersink the holes in the ¼" dowel, using flat-head screws for a neat job.

My wing is MonoKoted, the rest of the plane given a coat of uncut butyrate clear. When dry, sand smooth with 220, then thin some dope and use light Silkspan to cover the entire framework. Two or three coats of 50-50 dope, sanded between coats, are followed by a coat or two of balsa filler coat, until the surface looked smooth all over, then did the color—orange, lightened with yellow and a few dabs of white until it matches the MonoKote.

One last word, keep it light from the wing aft. My CAP balanced on the mark without adding weight. The model can be flown with anything from a good .40 on up to .60. It's about the size of some .60-powered jobs a few years back, so I have no qualms that a .60 would work OK. Haven't checked, but a 10 oz. tank should fit in the available space.

The control movements should be: rudder two inches to each side measured from the trailing edge of rudder; aileron throw is ¼ inch up and down from center; the elevator, due to its large size, is *no more* than ⅜ inch up and down. If you are flying from anything but a smooth concrete or asphalt runway, I would recommend using 3/16 music wire for the landing gear struts instead of the 5/32 shown on the plans.

Research could turn up some differences in some of the CAPs now flying. Also some have different color schemes. I understand there is a modified version of the 20, lighter and with more horsepower. I want to thank Bob Wischer for his help and encouragement all the way through this project.

Jerry Nelson has always been out front with new innovations in this modeling game, and his

efforts to promote models that look and fly like their full-size counterparts may finally be blossoming to full bloom with the Las Vegas TOC thing, and the IMAC organization promoting aerobatic models that have to be copies of full-scale machines. This CAP is one more addition to the pack, hopefully to add pleasure to others, just as it did for me. Glen and Hazel Sig and their gang up in Iowa are doing their share to promote the IMAC philosophy, so if you decide to build this CAP, sashay up there next year and enjoy the 'bash' they put on for the benefit of us modelers.

RC Aerobatics/Van Putte

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street in front of my house. If I said that my technique was faultless from the beginning and that the Eleck Rider performed perfectly, I'd only be half truthful. The cycle did perform perfectly, but my technique left a lot to be desired.

My initially poor driving ability had its advantages. Whenever I lost control and the cycle spun out, ran into the curb, dashed under by car or clobbered the mailbox post, it demonstrated the durability of the system. After two weeks of hard use by 13 novice drivers, my cycle has only scuff marks on the acetate fairing as evidence of its hard life. It's tough.

One of the first questions someone who has never seen it perform asks is, "How difficult is it to keep upright?" The answer is very simple. It's easy. Unless the driver does something to upset it, the cycle will happily drive forever in a straight line. If you want to turn it, that's a different story. The Eleck Rider requires coordination of throttle and steering to negotiate a turn. The tighter the turn, the more coordination is required.

Steering is not accomplished by turning the front fork; it is done by tilting the fork. The front wheel/fork is castered and is free to turn in any direction. So how does the cycle steer? Very nicely, thank you, and it is extremely stable, too. I have hit a number of obstructions which include rocks, a manhole cover, cracks in the pavement, acorns, jumping ramp, etc., and with very few exceptions the cycle has stabilized itself and motored on.

The electric motor is operated by a servo-driven rheostat. The throttle stick has a spring return to center. Forward movement of the stick provides proportional forward speed. Pulling back the stick causes the motor to function like a generator and acts as a brake. The "dead man" throttle feature is nice for beginners since the cycle will stop itself if you let go of the stick.

The best place to learn to operate the Eleck Rider is a large, smooth area like a parking lot. Once driving proficiency is achieved in the large area, smaller places can be tried out. The cycle is started by holding it upright, advancing the throttle and holding it stable briefly as it accelerates. Initial operation should be at about ⅔ throttle and only gentle turns should be attempted. Sharper turns must be accomplished by throttling back, turning the cycle and throttling up about halfway through the turn. The slower the cycle, the sharper the turn can be, but the cycle will fall over if it gets too slow. The key to success is proper coordination of the throttle.

It takes a proficient RC pilot less than half an hour to learn how to operate the Eleck Rider. Part of the problem that RC newcomers will have is deciding which way to move the stick when the cycle is heading toward them. An experienced pilot has an advantage in this area because he has already learned how to control an airplane coming toward him. Unfortunately, the old rule of "stick toward the low wing" doesn't help much with a motorcycle.

Am I enjoying my Eleck Rider? Well, every weekday I hurry home from work and drive mine for 30 minutes before it gets dark. On weekends it is tough to get all the chores done before taking it out. So far I haven't been able to do any racing with others, because I was "the first kid on the block" to have one. However, several others are on the way and we will probably be racing around water-filled milk jugs at a local parking lot as you read this. Get one!

In case you've been wondering when the next Pattern Problem of the Month will appear, the answer is: When I receive one from someone. The response to my request for problems has been very underwhelming.

Ron Van Putte, 12 Connie Drive, Shalimar, FL 32579.

Spin Tunnel/Robelen

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good brands.

I really am "stuck" on Hot Stuff type glue. It truly is superior! Very light in weight, it will never warp the thinnest tail surface, and of course, it dries immediately. The other brands, Zap, Jet, etc. are all fine, I'm sure; I just have not had much experience with them.

Various finish techniques are useful. Sometimes, I apply one coat of sanding sealer (Testors' Hot Fuel Proof) and trim with color. I am also pleased with the results of using spray dyes. I use "Deep-flex" brand in a spray can, which I found in a local variety store.

My usual method of construction is to start with the fuselage, where I lightly tack glue two blocks together so that they part on the vertical center line. I first shape the top view and then the side view, followed by careful shaping of the