

# MODEL BUILDER



SEPTEMBER 1976

volume 6, number 57

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SEPTEMBER

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Cover: Ken Long taxis his 9 foot span Consolidated PB5-5A "Catalina" under clear, El Paso, Texas skies. Scene is Burnett Field, the El Paso Radio Controllers' flying site, where Ken successfully test-hopped the ship which he built from Sid Morgan plans (see page 102). Power is two K&B .61 engines, and the radio is a Hobby Lobby 5. Engine cowls were removed for test flights. Photo by Warren C. Weaver.



An historic moment! The original 'Big John' meets the original 'Little John' during the 50th Nats at Wright Field, Dayton, Ohio. Big John was on his way back to his designer/builder, after being gone nearly 10 years (see text). Little John will try for another 2-year term with AMA.

## from Bill Northrop's workbench . . .

### HAPPY ANNIVERSARY TO US!

• Like it says on the cover, this is MB's 5th anniversary issue. If 5 years times 12 issues per year only figures to issue number 57 instead of 60, it's because we had to combine months a few times during our growing process.

Speaking of growing, that first issue of MB contained 40 pages (it seemed monumental at the time!), and only 2,500 were printed (we had to go back and print another 1,500 a few weeks later). Fortunately for us, the timing was pretty good, as we introduced that issue at the R/C Pattern World Championships, in Doylestown, PA., where Anita hawked the magazine from dawn to dusk every day, while we performed our duty as a judge, representing the U.S.

The magazine owes its very existence to the many modelers who contributed . . . in every sense of the word . . . articles, drawings, and photos that made up the editorial content of the early issues. It owes just as much to our many friends in the industry who literally gave us money in exchange for advertising space that would gain them small return in exposure to the buying public. And most of all, we are thankful for the thousands of letters that we have received from modeler/readers, who kept telling us that we were doing the right thing and "please don't change any of it!"

Now, 64 additional pages later (including 8 more this month) and 35,000 or so more copies per issue, we find ourselves totally and indefinitely in the model publishing business. It is alternately great, horrible, exhausting, exhilarating, frustrating, rewarding, discouraging, satisfying, and most of all, completely dominating of every 24-hour day.

We thank all of you for your encouragement, patience, and support. FIFTIETH NATS .

We have just returned from the 1976 Nationals, and of course, everyone who wasn't there asks, "How was it?"

Unless the asker and the askee(?) have a couple of hours to spend together, there's no way to answer such a loaded question. We'll give you a brief summary this month, and during the next two issues, will provide more detailed reports, along with photos.

MB's free flight, control line, and R/C pylon editors were in attendance, complete with camera and note pad, while this editor visited as many events as possible, but concentrated on R/C pattern and scale.

The 1976 Nats was something special. First, it was the 50th Nats, a situation which we are proud to have helped bring about. (Until late last year, it was still to be the 48th. However, in our July '75 issue, we published material put together by Bert Pond which indicated that the 1976 Nats would be the 50th . . . and wouldn't it be a shame if it slipped by without proper fanfare. As a result of this article, and further evidence by some of our volunteer model historians, the AMA Executive Council finally passed a resolution to recognize the 1976 Nats as the 50th.)

The 50th Nats couldn't have come in a better year. It tied in with the Bicentennial celebration, and it was held in the birthplace of U.S. aviation, Wright Field, home of the famed Air Force Museum . . . enough atmosphere to boggle the mind.

Also, returning to a more centralized location after two years in somewhat remote Lake Charles, Louisiana, the modeling population was "loaded for bear."

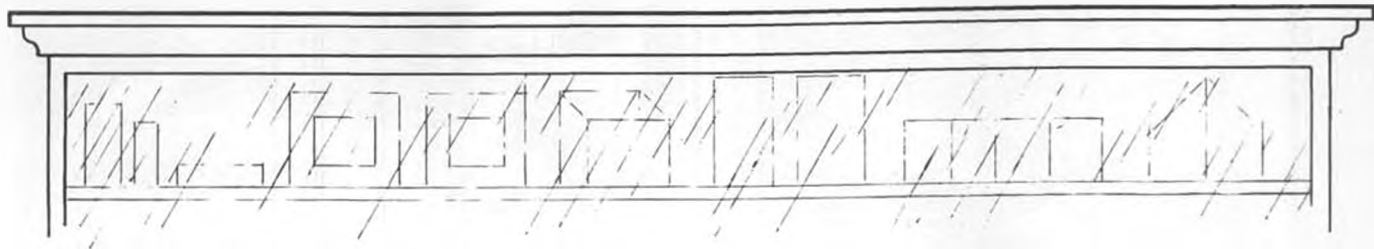
Though we don't have actual numbers at hand, it is generally agreed by all who attended, that most every event had doubled the number of contestants over last year . . . R/C Pattern was hit with a final count of around 260, including all pilot classifications, and the phenomenal young flier, Rhett Miller, made an unprecedented four in a row, as the Nationals R/C Champion . . . R/C Sport Scale had 50 competitors who actually flew (the count was higher before the flying started) . . . R/C AMA Scale had 12 contestants, more than double last year when an FAI team was being selected! Current World Champ, Bob Nelitz of Canada, proved again that Scale-like speed is not only possible, but highly desirable, as his Chipmunk took first place.

As possibly annoying to a few modelers as it may be, many R/C and C/L contestants missed the sight of DTing free flights coming down among them, and conversely, quite a few free fliers (who wish to remain anonymous) were disappointed at not being able to watch C/L and R/C. Space problems made it necessary for free flight, and R/C soaring to be held at another airport, in Springfield, Ohio, some 25 road miles away from Wright Field. Indoor was held in far off Columbus.

As usual, next years plans are already being discussed. If held in Dayton, it is highly likely that the whole show would be at Springfield. Two sites, one near San Diego, and the other at Oxnard, northwest of Los Angeles, are being considered. In either of the latter possibilities, the great blimp hangars at the Santa Ana Marine Air Base facility still look doubtful for indoor.

*Continued on page 102*

# OVER THE COUNTER



● Instant, painless hinge slots? A giant step in this direction has been taken by Carl Goldberg Models with its new four piece Hinge Slotting Kit.

A unique and foolproof Hinge Line Marker is first used to scribe an accurate center-line on any surface from 3/16 to 9/16 inch thick, even if tapered.

Next, the forked Slotting Fork is used to pierce a slot of the correct thickness and width. The Slotting Hook Blade is then used to clean out the remainder. Presto, you've got a clean, precise hinge slot.

The complete set, including a special aluminum handle and complete instructions, is only \$1.95. Replacement markers or blades can be had for \$.50.

It's another modeler designed 'goodie' from Carl Goldberg Models, Inc, 4734 W. Chicago Ave, Chicago, IL 60651.

\* \* \*

All R/C'ers will agree that a throttle more than doubles the fun. Well, you no longer have to do without one on your favorite Half-A. Ace R/C has re-introduced its very successful Throttle Sleeve for the Cox .049 and .051, which had been dropped due to unavailability. The new type, from a different manufacturer, is made to higher tolerances, fits better, and is claimed to work surprisingly well. With a slight modification, the sleeve will fit virtually any Cox .049, but is designed specifically for the Tee Dee's.

Ask your dealer for the Ace Throttle Sleeve, Stock Number 16L60-TDTS, priced at \$2.50.

Other new products to recently become available from this progressive company are those small screws that are so easy to lose and so difficult to replace.

The Number 2 self-tapping screw, as used to hold the arms on so many servos, is listed as No 40L233, 12 for 45¢.

Flat head screws, size 2-56, as used to hold some servos together, or to flush-mount things such as hatches, are available in two lengths, 1/4 inch as No 40L237, and 1/2 inch as No 40L238. Either size, 12 for 45¢.

Heat shrink tubing, in the very necessary 5/16 inch I.D. size, is available packaged in 10 one-inch lengths, No. 40L217, for 55¢. This is the size that will fit a majority of radio plugs, and



Carl Goldberg's Hinge Slotting tool.

gives added protection at a possible problem area.

All of the above, plus hundreds of other items as listed in the Ace catalog, are available through most dealers or direct from Ace R/C, Box 511 Higginsville, MO 64037.

\* \* \*

Your dealer should now have the tried and proven Devcon Epoxies packaged in giant "Family size" containers. Both the five-minute curing for super fast repairs and building, and the 30-minute curing varieties for normal building requirements, are available. It is



R/C Throttle Sleeve for Cox .049/.051 by Ace R/C.

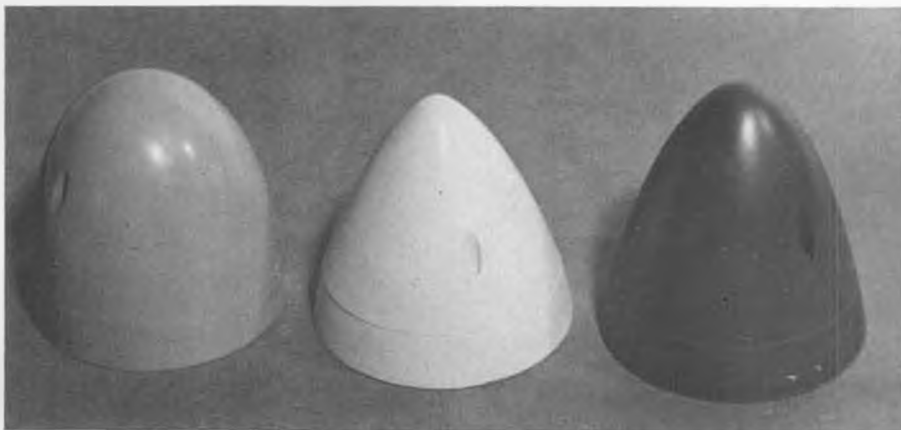
claimed to bond all metals, wood, fiberglass, and most plastics.

Packaged in 4-1/2 ounce, non-breakable squeeze bottles for a combined weight of 9 ounces, at \$5.80 for the type of your choice.

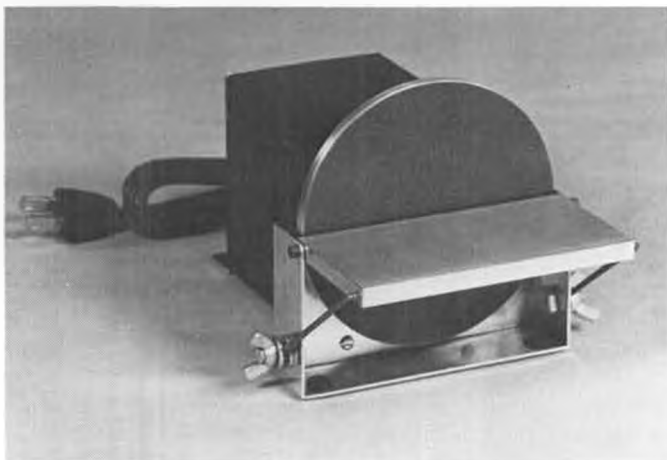
Distributed by Du-Bro Products, Inc, 480 Bonner Rd, Wauconda, IL 60084.

\* \* \*

If you have admired and enjoyed working with the type of finish you see on the edges of wood furnished with kits that come supplied with "machine shaped balsa", you'll be interested in this new table top disc sander by Mathes



Big 3-1/2 inch spinners for WW II scale fighters, by Emandi.



Precision table-top disc sander by Mathes Electronic Systems.



Rubber powered scale Macdonald S-21 by Mark's Models.

Electronic Systems. You'll now be able to have your own normally hacked-out pieces look and fit the same as the highest quality kits.

Designed and built around a heavy duty 3000 rpm industrial motor, and using metal parts only throughout its construction, this rugged little sander is capable of fast finishing and shaping of all common model construction materials. The heavy aluminum four inch disc and adjustable angle table assure accuracy limited only by your own skill and experience.

Uses precut sanding discs readily available in all hardware and tool stores, or simply make your own from sheet stock. You should not be without this \$24.95 goodie, complete with cord and switch.

If not yet available at your dealers, ask him to contact Mathes Electronic Systems, PO Box 132, Lake Havasu City, AZ 86403, (602) 855-3633.

\* \* \*

What next, Mark Smith!? From sailplanes, to seagulls, to Formula One . . . and now, of all things, rubber powered scale!

Mark's Models is now offering a kit for a rubber powered scale model of the Macdonald S-21. Designed by internationally known Bill Hannan, this new kit builds very rapidly into an attractive 18 inch span low winger, capable of successful, sustained flights. While it is claimed as a design for the beginning builder, the airplane itself, and the kit, should appeal to the experienced builder/flyer.

The kit includes all die-cut and machined balsa parts, plans and instructions. Introductory priced at only \$4.25, from your dealer, or inquire at Mark's Models, Box 2134, Escondido, CA 92025.

\* \* \*

With the firm belief that it's what's up front that counts, Emandi, of Culver City, CA., now brings you scale spinners with scale contours, as seen on the full scale birds. No more 5 foot P-51's with spinners that look more at home on a Quarter Midget.

Emandi's new 3-1/2 inch plastic spinners are especially designed for P-39 or P-40, P-51, and FW-109 models, as available from Dave Platt Models, D&B, Top Flite, Jemco, and other companies.

The spinners are furnished without prop cutouts, so that you can tailor one to your scale three or four-bladed scale prop, and another for the two-bladed flying prop.

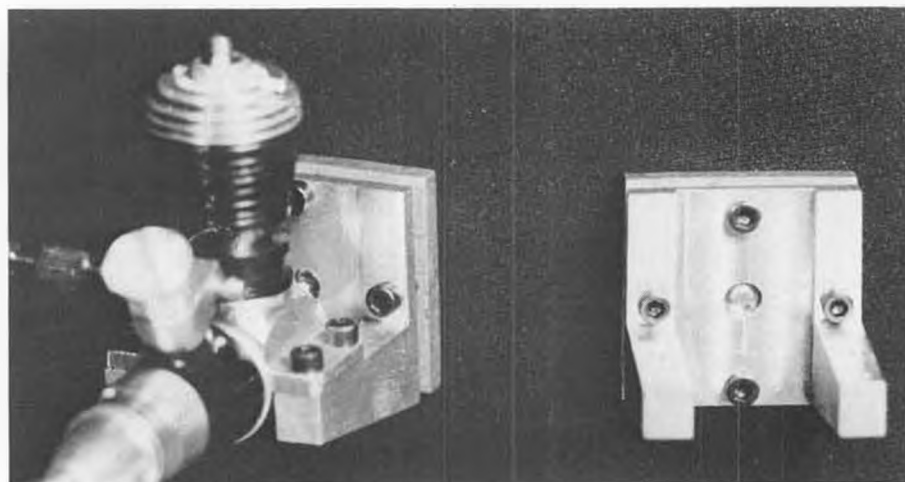
The FW style is available in yellow only, at \$6.95. The other types come in

your choice of black, white, red, or yellow, at \$5.95 each.

Tell them you read about them in MB when your order yours from Emandi, 12035 Havelock Ave, Culver City, CA, 90230.

\* \* \*

Anyone who flies contests of any type knows that nights comes in different lengths. The ones before a contest for which you are not fully prepared are always shorter than the ones that find



Totally adjustable thrust line, with S&S Hobby's .049 engine mount.



Super LR-1A for Formula One, by Speed Glass Products.



The "One Nite 28" held by Vera Peck, of Peck-Polymers.



Profile Navy Carrier, "Vulture", by Ed's Garage.

you all set.

Up to now, you had no choice, but Peck-Polymers has solved that for you. You can now have, for the small fee of \$3.49, a "One Nite 16". If your requirements call for more than that, the "One Nite 28" is available for \$4.75.

These are two new kits, both high performance rubber powered sport models, also designed to meet the rules of the Orbiteers P-30 class contest. Both models have been extensively flight tested and are excellent flyers.

As might be expected, the "One Nite 16" has a 16 inch wingspan, while the larger version spans 28 inches. Both kits contain contest balsa, detailed plans and photo instructions, precision nylon thrust bearings, contest rubber, plastic prop, and wheels. The "28" uses a large 9-1/2 inch prop.

Available at your dealers, or direct from Peck-Polymers, PO Box 2498, La Mesa, CA, 92041.

\* \* \*

Is your Rolls hard to start, lacking pep, burning oil? What about the wife's Jensen Healey; has she complained lately that it has a 'funny noise?' Well, *don't* call Ed's Garage, in Tarzana, Ca; he is not your man.

However, if Navy Carrier is your

thing, Ed's record-breaking profile 'Vulture' could be exactly what you've been hunting for. This 330 square inch beauty is designed for hot .35's, and includes all machined parts, complete instructions and full size plans, \$23.95.

For more information about this and other high quality controline and RC kits, write Ed's Garage, 5132 Chimineas Ave, Tarzana, CA., 91356. Please mention that you read about him in MB.

\* \* \*

Well known Formula One and FAI racer-builder-designer, Bob Root, has turned to Quarter Midgets, and has rapidly established his 'Li'l Cobra', patterned after the P-63 Kingcobra, as 'the one out front' in Southern California QM races.

Available in a fiberglass-foam-balsa kit which rapidly builds up into a minimum-weight, 2-1/2 pound airplane, this extremely stable, extremely fast racer will present no flying problems even to a novice pylon turner. The polyester fuselage weighs just over four ounces, and will meet all existing QM cross section rules. A precision cut wing core, machined wood pieces, and all hardware are included.

The low profile, low-drag nose gear will end those buck-a-flight propbreaking landings so familiar with the tail-draggers.

Complete kit, with full size plans and instructions, less only wing skins \$50.00 postpaid in the U.S., available from R/C, Etc., Box 127, Costa Mesa, CA. 92627.

\* \* \*

Do you have a problem getting the proper Up-Down-Left-Right thrust set into your Half-A airplanes. Fear not, S&S Hobby Products has come to your rescue.

The S&S precision machined polished aluminum mount is adjustable in all directions, or any combination required. Using a simple ball and race arrangement, with hardened machine screws to hold the set and desired position, this principle has not been previously seen in this application but should do the intended job perfectly. The desired adjustments are easy to make, yet the engine is rigidly held for best operation.

All holes are drilled and tapped for the Cox Tee Dee engines, and all mounting and adjusting screws are included. The price is \$7.95, from S&S Hobby Products, 525 S. Cloverdale Blvd, Cloverdale, CA. 95425.

\* \* \*

Do you have club members nicknamed 'Stubbs' and 'Scarface', otherwise known as the guys who used to stop engines by

*Continued on page 70*



Quarter Midget "Li'l Cobra" by R/C, Etc.



Midwest Products' all-foam "Attacker".



# sport trainer SOLO

By STAN JOHNSON . . . A full house R/C trainer for .19 to .40 size engines. Unusual feature is the use of cardboard tubes for wing spars . . . easy to build, warp-proof, and very sturdy.

• The Solo is a sport trainer with the look of a full-size aircraft and many features that make it ideal for the student R/C pilot. It is lots of fun for the Sunday flyer too.

The Solo is a stable and gentle four channel trainer that *you can learn to fly on*. Once you've mastered the basics, the symmetrical wing section and shoulder wing design allow the Solo to be a responsive but gentle aerobatic trainer.

The tube spar wing construction is a unique feature of the Solo. This type of construction is fast and easy to build. It is more resistant to warping, and very strong. The airfoil is more consistent than on wings built with conventional spars, because the covering material is allowed to dip in a uniform manner between the ribs.

The wide stance of the Solo's main gear really smooths out rough landings. You can fly it onto the ground in a 30° bank without dragging a wing tip. That's a real plus for the novice R/C pilot.

The Solo is not just another box with wings. It looks good, and flies great. Build one; I know you will like it.

## GENERAL CONSTRUCTION

You can use any 7/8 to 1-1/8 inch diameter cardboard tube with about 1/16 wall thickness for the spars. K&S piano wire tubes, 1 inch mailing tubes, or Solarfilm roll tubes will all work. Just be sure they are straight. You will need two tubes 24 inches long. The wing is built on jig blocks. The height of these blocks is determined by the diameter of the spar (1/2 inch tall for 1-1/8 inch diameter spar, 9/16 inch tall for 1 inch diameter spar, 5/8 inch tall for 7/8 inch diameter spar, etc.). Cut the jig blocks out of 1/4 inch or thicker

sheet balsa to the height required for the size spar you use.

Sig Manufacturing's 1/8 inch "Lite Ply" is used for the one-piece fuselage sides. Lite ply is strong and light and eliminates the need for fuselage doublers in the nose.

The three-views of the cowl shown on the plans can be used as a guide to carve a mold to vacuform a cowl. You can also mold a cowl from fiberglass. The Solo flies fine without the cowl. It is not a mandatory item, but the model has much more eye appeal with one installed. If you don't care to fabricate one, a vacuformed cowl for the Solo is available from Solution Aeromodel Company, 6112 McKinney N.E., Albuquerque, New Mexico, 87109.

The basic structure of the Solo is strong and simple to build, but since the plane is intended for the novice, we will go through the building instructions step-by-step.

## WING CONSTRUCTION

Glue 1/8 square balsa strips to the

edges of the dihedral brace as shown on the plans. Draw a reference line on one end of one of the tube spars. Glue the 1/8 ply dihedral brace into this spar so that the brace coincides with the reference line. You will have to sand a radius on the 1/8 square balsa strips on the dihedral brace so that it will fit snugly in the tube spar. When the glue sets (use Titebond or equivalent), glue the other spar on the dihedral brace and set it on a flat surface to keep it straight and true. Be sure that the ends of the tube meet squarely at the joint.

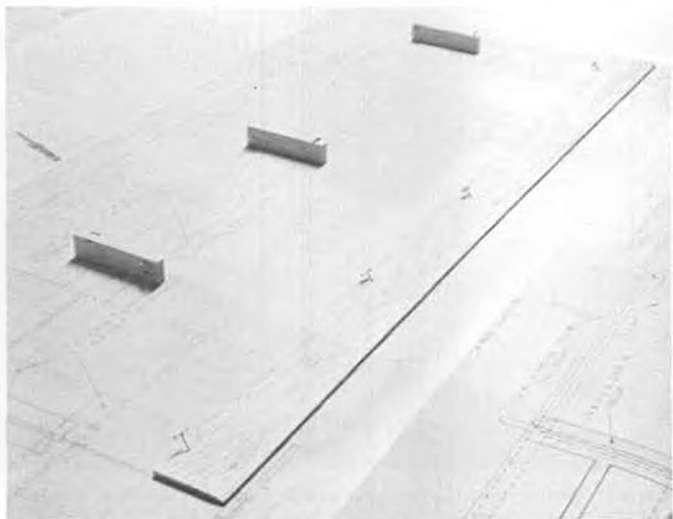
Sand or plane a taper on the mating edges of the trailing edges as shown on the plans. Lay the plans on your workbench with wax paper or plastic film over the wing plan. Pin the trailing edge and jig blocks to the plans.

Place the center ribs on the plans and mark reference lines where indicated. (Note, the center rib is 3/16 balsa.)

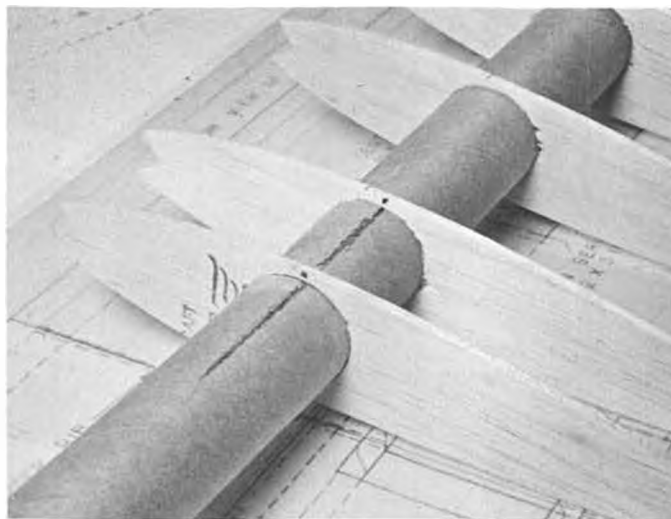
Slide the 3/16 center rib, the 3/32 ribs numbered 1 and 2, and the eight 3/32 main ribs numbered 3, onto the



Three-quarter rear view accents wide landing gear tread. Lack of surface spars permits smooth airfoil along full span of wing. Sheet tail surfaces add to ease of construction.



Jig blocks will vary according to size of tube-spars used. Adjust so ribs make full contact with pinned-down trailing edge sheet.



Be sure to align the dihedral brace and center rib reference marks. Prevents swept forward or backward wings with wrong dihedral!

spar marked with the dihedral brace reference line. Space them as shown on the wing plan.

Pin four or five main ribs to the trailing edge to align the main spar on the jig blocks. Now rotate the spar so that the dihedral brace reference line on the spar aligns with the reference line on the center ribs. This assures the proper dihedral. When all is aligned, pin the spar to the jig blocks.

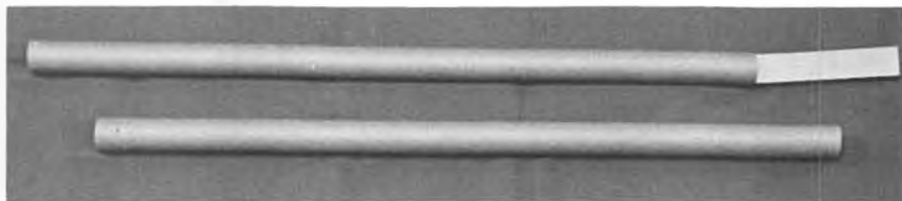
Glue the ribs to the trailing edge. Glue on the 1/2 inch square leading edge. When the glue sets, add the top trailing edge piece. Check everything for alignment. Then glue the ribs to the tube spar (Use Titebond or equivalent). If the wing is straight when the ribs are glued to the spar, the wing will stay that way. The tube spar is very rigid and resists any tendency to warp. While the glue is setting on the wing panel, carve and sand the ailerons to the cross section shown on the plans.

When the right wing panel is dry, remove the wing structure from the plans. Reposition the jig blocks to the dotted lines. Turn the wing structure around on the plans to build the left wing panel. It is constructed in the same manner as the right panel.

When the glue dries, remove the wing structure from the plans. Cut the trailing edge and tube spar flush with the tip ribs. Notch the back side of the leading edge outboard of the last rib as shown on the plans. Glue the wing tips and gussets in place. When dry, sand the wing tips flush with the trailing edge and glue on 3/16 balsa trailing edge braces.

Plank the top center section of the wing with 1/8 balsa. Cut notches on the bottom of three center ribs to install 1/8 x 1/2 x 3 inch plywood aileron servo mounts. Space them to fit your servo. Plank the bottom center section of the wing. When the glue is dry, cut away the bottom planking between the servo mounts to provide clearance for the aileron servo.

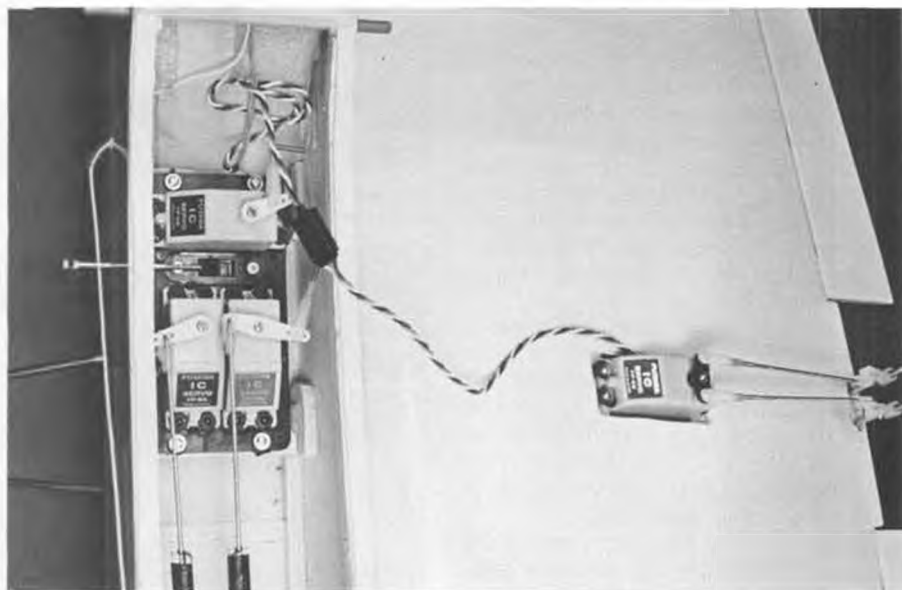
Cut the aileron horn bearing tubes to



Cardboard tube-spars can come from several sources, can vary in size from 7/8 to 1-1/8 inches in diameter. Dihedral brace has been inserted in one tube.



Right wing panel on construction board. Leading edge and top trailing edge sheeting have been added. Might be fun to put cork in tip and carry odds and ends to flying field!



Futaba radio installation in the prototype Solo. Everything is straight, simple, and easy to service. Slide switch should pull out for "On".

the length shown on the plans. Install tubes on the aileron horn wires. Bend the wire to the size and shape shown on the plans (Make one left and one right). Put a few drops of light oil in the bearing tube to keep the epoxy from gluing the horn wire to the bearing. Epoxy the spruce aileron horn mounts and the aileron horns to the trailing edge of the wing in the position shown on the plans. Make sure the threaded portion of the horns are on the bottom side of the wing.

Sand the entire wing smooth. Round the leading edge as shown, taper the trailing edge brace to match the aileron cross section, and round off the edges of the wing tips. Reinforce the center section with glass cloth and resin or glue. The wing is now ready to cover.

#### FUSELAGE AND TAIL SURFACES

Cut the center out of the fuselage former, using the template on the plans as a guide. Glue 1/4 square by 2-1/4 inch long balsa stiffeners to the former. Glue 1/4 square by 2-1/4 inch long balsa stiffeners to the bottom ends of the nose block. Viewed from the top looking forward, the nose block is 1/8 inch shorter on the right side than on the left. Leave a 3/8 inch space on either side of the stiffeners. Glue the horizontal and vertical stabs together. Pin them to a flat surface to keep them straight while the glue sets. After the glue sets, round off the leading edges of the tail surfaces and shape the control surfaces to the cross section shown on the plans.

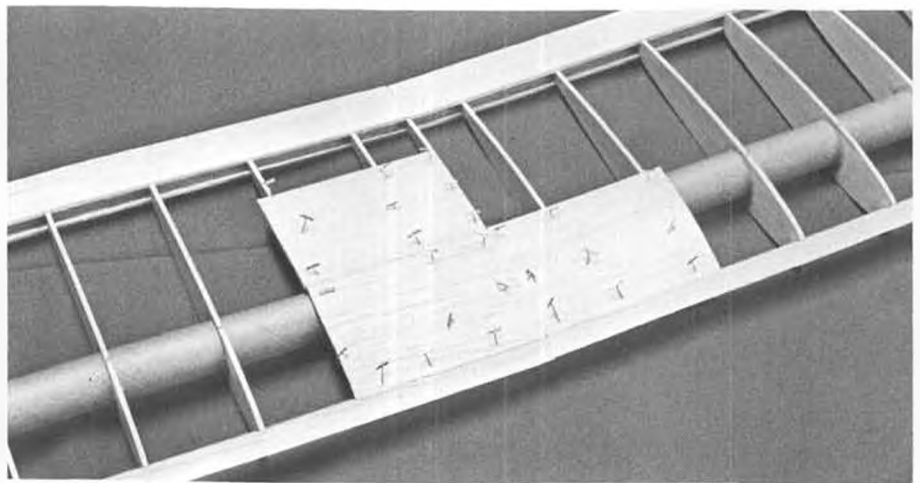
Using spring clamp-type pins to hold them in place, glue 1/4 square balsa stringers to the left and right 1/8 inch lite ply fuselage halves. Note that the right fuselage half is 1/8 inch shorter than the left. This allows for proper engine offset when the firewall is installed. Glue on the wing saddle braces.

When the glue sets, clamp the fuselage sides back-to-back and sand to identical outlines. Align the fuselage sides from the tail end (Remember, the right fuselage half nose is 1/8 inch shorter than the left).

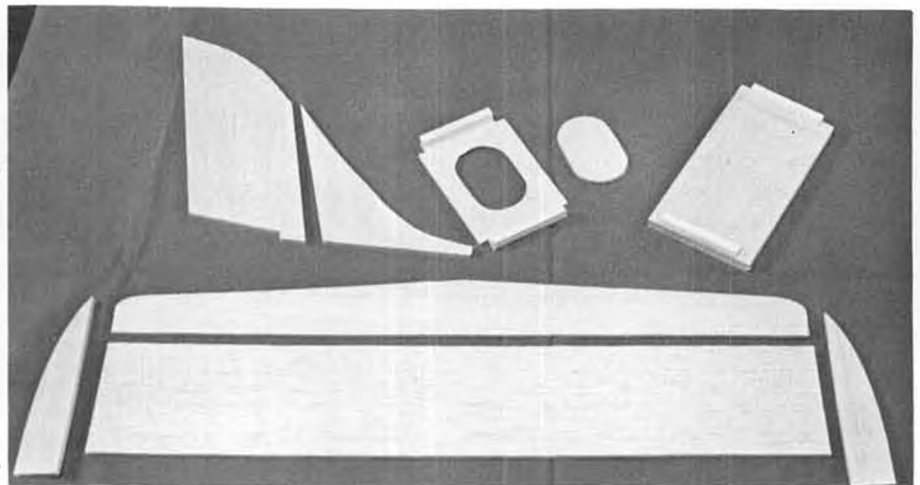
Mark the position of the former and landing gear mount on the fuselage sides (Again, the right side is shorter than the left). Glue the top nose block, former, and landing gear mount to the right fuselage half (Note that the short side of the nose block goes on the right fuselage half). Use a square or triangle to check that they are perpendicular to the fuselage sides.

Join the fuselage halves. Use masking tape and pins to hold them in place while the glue sets. Do not join the fuselage at the tail. Glue a 1/4 square by 2-1/4 inch long cross brace between the fuselage halves at the bottom front corner. Check that everything is in alignment and set aside to dry.

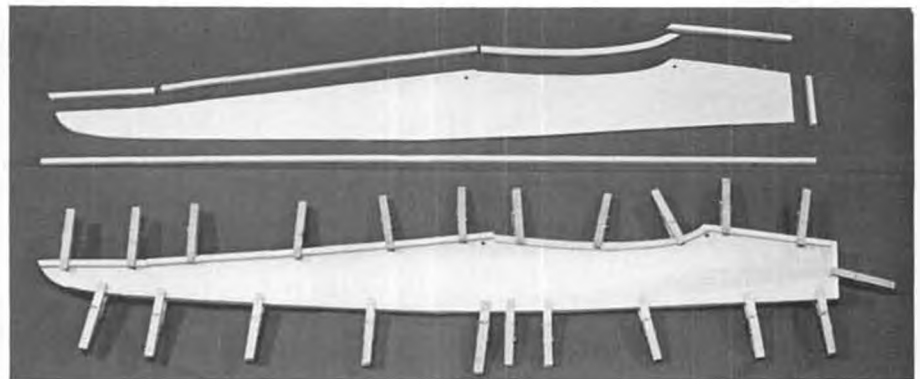
Sand the top and bottom edges of the former flush with the fuselage side. Glue the 3/16 turtle deck to the top of the fuselage. Take care that the fuselage



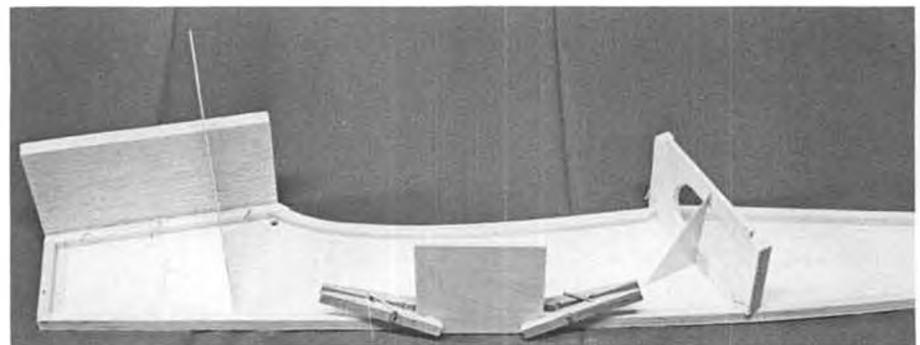
Sheet center section, starting at leading edge. If necessary, dampen outside surface of sheets so they will try to curve to fit the rib curvature.



Tail surfaces and fuselage bulkheads can be cut out and glued together so they will be ready for use when you come to that part of the construction.

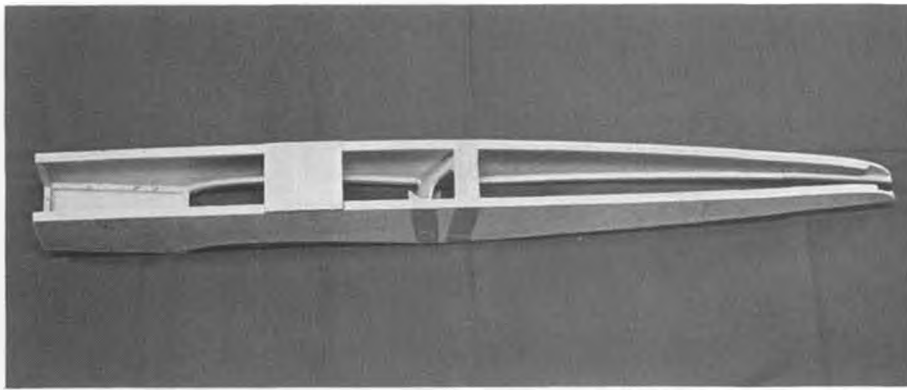


It's hard to push straight pins into the Lite Ply fuselage sides. Use clamps or spring-type clothespins to hold stringers. Be sure to make left and right halves! Think!

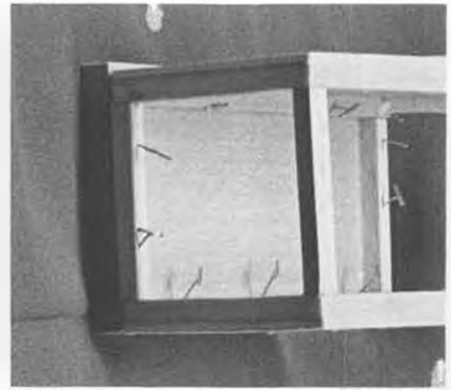


Use a square or builder's triangle to make sure these pieces are exactly perpendicular to the fuselage sides. It's now or never for symmetrical fuselage alignment.





Use masking tape and pins to hold fuselage sides together while the glue is drying.



Lower front fuselage cross-piece lines up fuselage for bottom planking and firewall installation.

sides coincide with the turtle deck as it narrows towards the tail. Starting on either side of the 1/8 ply landing gear mount, plank the fuselage bottom with 1/8 balsa. The grain of the wood must run crosswise.

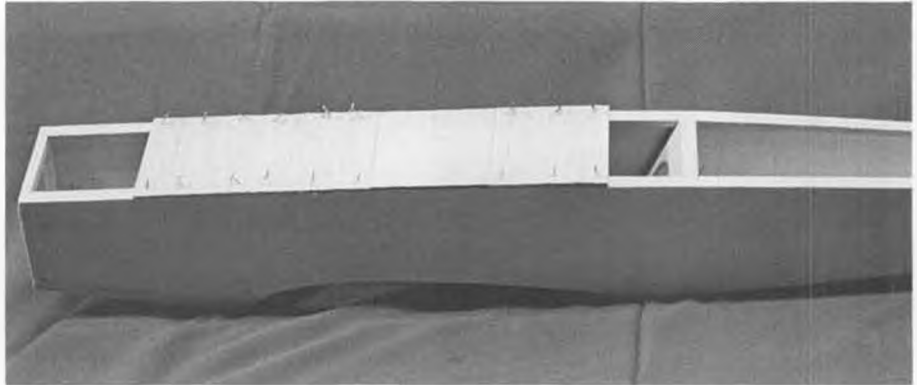
Using the appropriate template on the plans, mark and drill the firewall for the motor mount screws, fuel vent holes, and nyrod holes. Use a 9/64 drill for the motor mount and fuel vent holes, and a 3/16 drill for the nyrod holes. (Note: These templates are for Kraft Hayes motor mounts only). The fuel vents and nyrods are spaced for engines with the throttle arm on the right hand side, and the fuel line on the left. The nose gear steering is also on the right. If you mount your rudder servo on the left (see the radio installation instructions) and/or your engine's throttle arm is on the left, make your own template to suit your equipment. Glue the blind nuts for the motor mount on the back of the firewall. Sand the front of the fuselage so that the firewall mounting surface will be smooth and flat. Glue the firewall on, using masking tape to hold it in place while the glue sets.

Make the cut outs for the elevator and rudder pushrod exit holes in the places indicated on the plans. Round off the corners of the fuselage as shown, and sand the entire structure smooth. The fuselage is now completed.

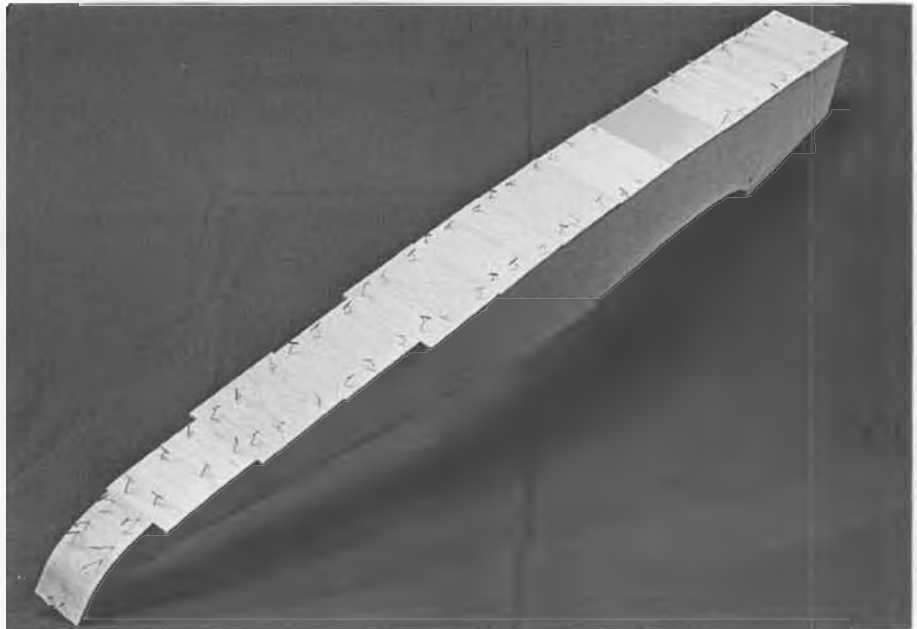
If you like, you can reinforce the landing gear mount and firewall with two ounce glass cloth and a coat or two of resin.

#### COVERING AND FINAL ASSEMBLY

The Solo was designed with the modern mylar film coverings in mind. See the chart on the plans for a guide to the best utilization of the covering material. Cover the model according to the instructions provided with the plastic covering. Before you cover the wing, fin, and horizontal stab, make sure the ailerons, rudder, and elevator fit correctly. Don't forget to allow for the hinge gap between the control surfaces. Drill a 3/32 hole and cut the slot in the ailerons for the aileron horns before you cover them. Cover all the components of the model before final assembly. Trim model to suit your taste.



Start bottom planking at landing gear mount and work toward both ends of fuselage. Planking is applied cross-grain for maximum strength.



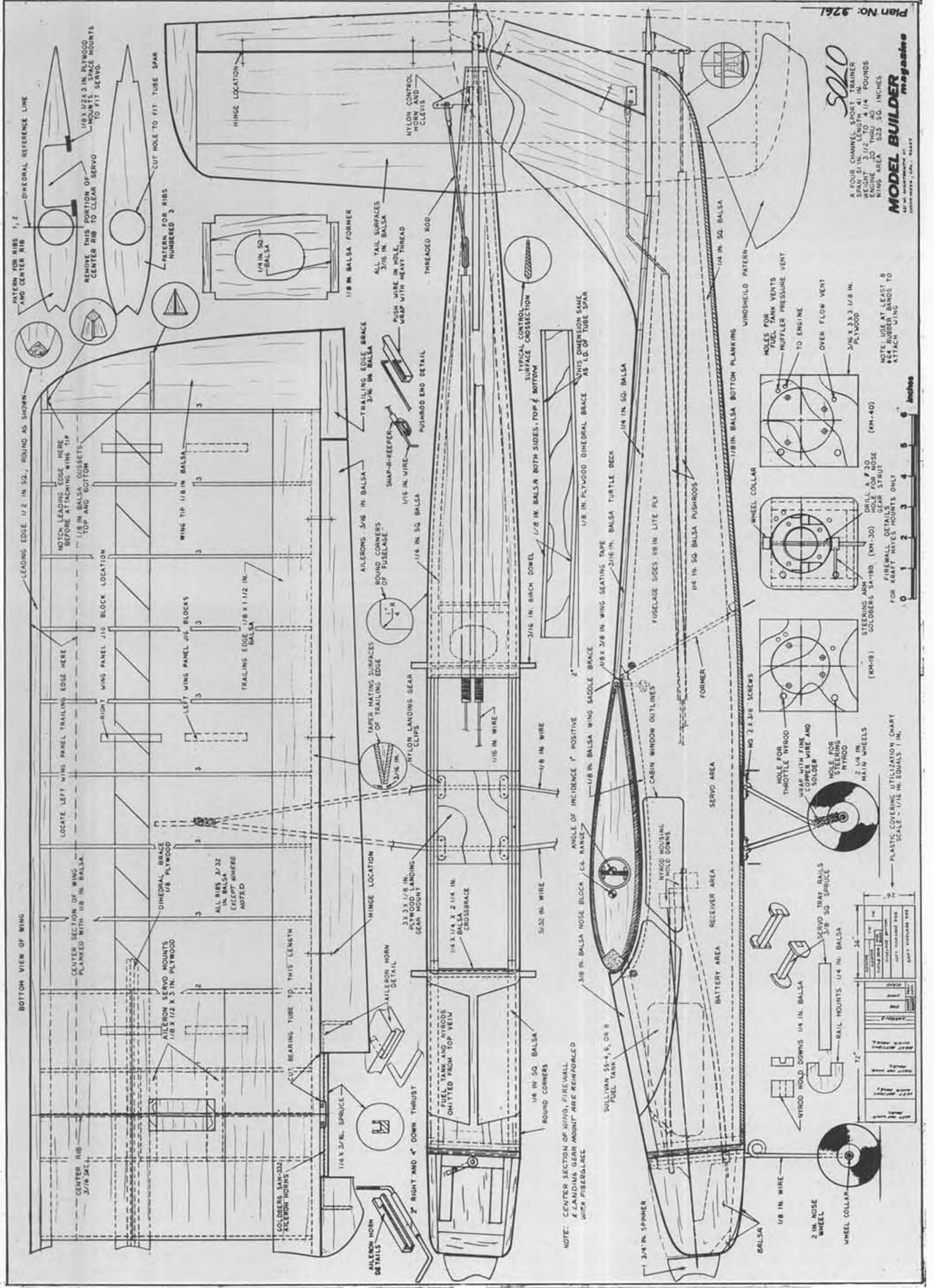
Completed bottom planking, ready for drying. When dry, carefully trim off excess with a razor blade or Uber Skiver, and sand to a smooth finish.

Patterns for windshield and cabin windows are included on plans. Make them from Monokote trim sheet or equivalent.

Cut the hinge slots where indicated on the plans and install the control surfaces with molded plastic hinges. Use Titebond or epoxy to glue hinges in slots. Glue the horizontal and vertical stabilizers on. Cut away covering materials from the surfaces to be glued. Check for proper alignment before the glue sets. Glue in the wing hold-down

dowels and install the 1/8 wing seating tape in the wing saddle. Bolt on the control horns for the rudder and elevator.

To install the main gear, mount the landing gear wires on the fuselage first. Now bring the two wires together, wrap, and solder them as shown on the plans. Attach the main wheels (DuBro wheel collars work well). You will have to drill out two of the 1/8 inch nylon landing gear clips to fit the 5/32 wire. Clamp or bolt them to something flat



Plan No. 9261

**MODEL BUILDER**  
magazine

A 2-3/8" CHANNEL SERVO HOUSING  
SPAN 3 1/2" IN. LENGTH 4 1/2" IN.  
HEIGHT 3 3/8" IN. TO CENTER OF  
SERVO MOUNTS TO FIT SERVO  
WING AREA 5 1/4" X 5 1/4" INCHES

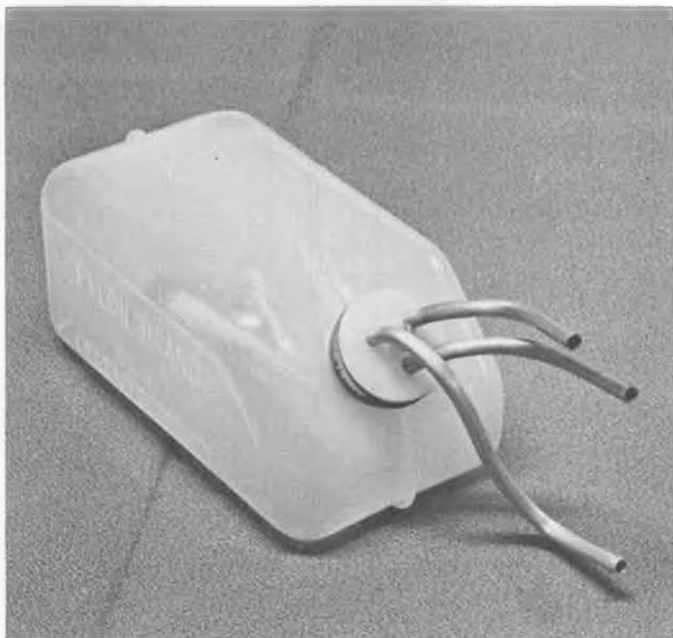
NOTE: CENTER SECTION OF WING, FIREWALL  
& LANDING GEAR MOUNT ARE REMOVED  
WITH PRECISION

NOTE: USE AT LEAST 6  
#24 RUBBER BANDS TO  
ATTACH WING

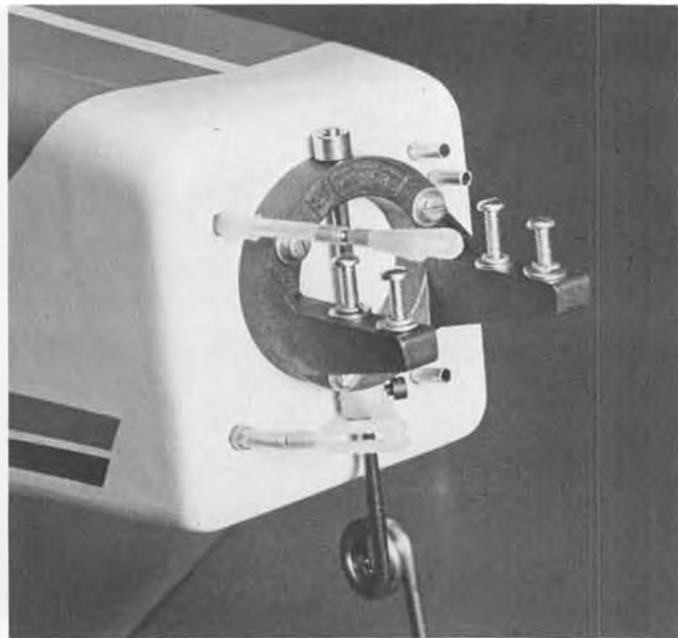
SCALE - 1/16 IN. EQUALS 1 IN.

WHEEL COLLAR  
2 IN. NOSE  
WHEEL  
1/8 IN. WIRE

WHEEL COLLAR  
SERVO HORN BALLS  
2 1/4 IN. SPRING



Sullivan Products Pylon Brand slant-front 6 ounce tank with K&S EZ Bend brass tube plumbing added. See text for clever installing.



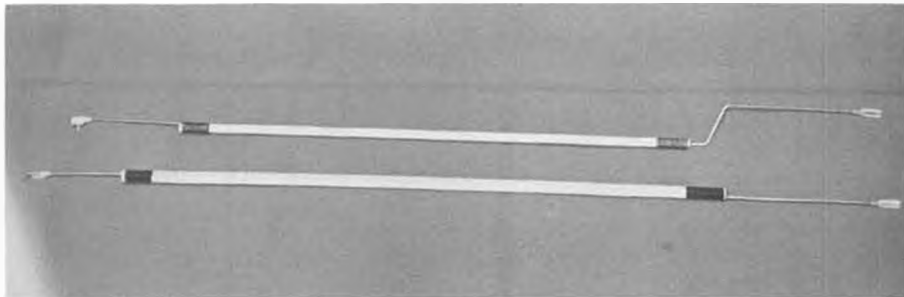
Firewall set-up if molded cowl is used, all ready to accept engine. Kraft-Hayes mount has been drilled to take steerable nose gear.

and hard. Then run a 5/32 drill clips to the fuselage. Drill No. 60 pilot holes for screws. The wide stance of the main gear will keep you from skinning the wing tips and doing ground loops on not-so-good landings.

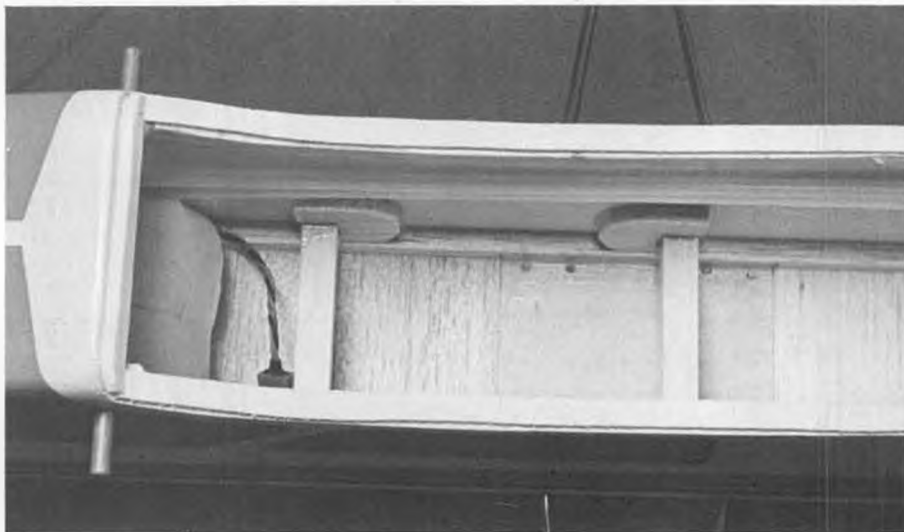
Place your Kraft-Hayes mount over the appropriate template on the plans and mark it to drill a No. 30 hole for the 1/8 nose gear strut. Install the nose gear strut, steering arm, and wheel on the engine mount. Bolt the engine mount to the firewall. Use 4-40 bolts with lock washers and flat washers. Bolt the engine to the mount. Install the nyrod housings in the firewall. Use epoxy to hold the housings in place.

To install the tank, bend the fuel lines coming from the tank as shown in the photograph. Slip three wire rods through the fuel vent line holes from the front side of the firewall. Slip the tank vents over these rods inside the fuselage and push the entire assembly forward into place. The wire rods will guide the tank vents through the holes in the firewall. Use foam rubber to hold the tank in place. Seal the holes in the firewall around the tank vents with epoxy or silicon rubber.

Nyrod pushrods are used for the throttle and nose gear steering. Quarter inch square balsa, threaded rods, and 1/16 music wire are used to make the pushrods for the rudder and elevator. The threaded rods go on the control surface end of the 1/4 square balsa pushrods. The 1/16 music wire is used on the servo end. Snap Klevises and nyrod studs are used to attach the nyrod pushrods to the servos and engine, etc. Snap-r-Keepers are used to attach the elevator and rudder push rods to the servos. Snap Klevises are used on the control surface end. When you make up the pushrods and nyrods, leave the



Pushrods ready for installation. We would recommend that you avoid, if at all possible, the extreme offset shown for the rudder. This will bend under heavy air loads.



Space servo tray mounting rails to suite your particular radio installation. Keepers prevent the rails from jarring loose during heavy impacts or persistent engine vibration.

ends that are attached to the servos extra long. You will not be able to cut them to the exact length until you have established the correct radio location in the model.

#### RADIO INSTALLATION

Read the installation instructions that come with your radio first. Then . . .

The radio components are used to obtain the correct center of gravity

(C.G.) position on the model. This is done by moving the radio components back and forth in the radio compartment until the model balances correctly. To do this, the model must be completely assembled with all items such as the engine, muffler, spinner, prop, wheels, installed. In other words, the model should be completely finished with the

*Continued on page 75*



Glenn Witt's Hancock Waco about to land at the 18th Mile High contest in Denver, Colorado. If it weren't for the shadow on the ground, you'd swear the wheels were only inches from touch-down.

ALL MILE HIGH PHOTOS BY LARRIE SCHAFFER

# 'REMOTELY SPEAKING...'

R/C News, by BILL NORTHROP

## FCC AND R/C

• Just before leaving for the Nats, we received word that the FCC has released 17 new frequencies for the "Garbage Banders," to take effect on January 1, 1977. If it's any consolation to modelers who use the 27 mhz band, the R/C frequencies have *not* been taken. The new CB channels are in the 27.235 to 27.405 range.

The FCC is specifically prohibiting the use of add-on devices that increase the range on existing transmitters (rottsa ruck), and in response to broadcaster's objections, has specified new suppression requirements for new transmitters to protect TV channels 2, 5, and 7 . . . those most affected by Garbage Band inter-

ference.

Incidentally, the 17 new frequency add-on is an interim measure, so the threat to the 27 mhz R/C channels still exists. Meanwhile, we understand that AMA's Frequency Committee is investigating the 35 and 40 mhz bands, which are already being put to use for R/C in some European countries.

\* \* \*

Editorial Assistant, Eloy Marez, reports the following:

"In the light of what is most important to us personally, we sometimes lose sight of the fact that the FCC does other things than worry about us and CB'ers. In a recent action, known to the Ham world as the Amateur

Restructuring Docket, No. 20282, the FCC has announced a number of changes to the amateur laws. Of interest to us as R/C flyers is that existing licenses that were obtained through mail exams will be 'grandfathered' to normal licenses, and will have full credit towards higher license classes. If you have a Technician's license, you no longer have to worry about being called for a retake.

"Probably of most interest is that the Technician Class License, the easiest to obtain class that permits R/C flying on Six Meters, is no longer available by mail. As of July 23rd, you'll have to do it the hard way down at your local FCC office."



Close-up of Glenn Witt's nicely finished Waco. A Dave Platt Models kit, it was actually designed by Joe Hancock, who now owns firm.



Another fine Waco. This one by Dean Copeland, who placed 2nd in Sport Scale at Mile High. Note corrugated ailerons, wheel pants.

Perhaps those of you who have had bad thoughts toward the FCC regarding the CB infiltration should stop and look at the other side of the coin. After all, when you finish reading the following Associated Press report written by Ed Howard, you'll realize what a wholesome and fun-loving bunch of people some of the CBers are, and why it is that the FCC is so anxious to encourage them in their harmless and educational pursuit by giving them more frequencies. Obviously, those of us who piddle around with toy airplanes, are missing all the fun!

*The explosion of CB radio sales has led to battles for air time all over the country. "Bear Tracks" died after one such squabble and "Blue Rover" is on trial for murder in his death.*

*And the case may rest on the testimony of "Sidekick" and the "Blonde Bomber."*

*It hasn't been easy for the judge. He occasionally has to interrupt testimony to make sure he understands what witnesses mean when they use CB lingo.*

*Blue Rover is the citizens band radio "handle" of Clyde Rice, 31, who is charged with first-degree murder in the April 10 slaying of Donald Edelman. Edelman's CB tag was Bear Tracks.*

*A spokesman for the FCC says similar squabbles have been reported all over the country as 15 million CB-set owners vie for time on the 23 channels open to them. Incidents have included beatings, threats and vandalism of CB antennas.*

*Sometimes air time isn't the issue, of course. Two Turlock, Calif., CB'ers argued in March over a "handle" they both wanted to use . . . "Bulldozer." They met in a parking lot, one carrying a jack handle and the other a shotgun. Friends and police intervened before anyone was hurt.*

*The FCC, which regulates citizen band radio use, is expected to rule next week on a request to double the number*



Neat Fleet! Built by Charlie Pirtle, from plans in May '75 MB. Clever posing of subject adds to its realism . . . nothing to give away actual size. Charlie's from Houston, Texas.



Side-by-side photos of Pirtle's Fleet, and a full-size 1941 Fleet, from the same angle. It takes a little more than a casual glance to tell which is which.

*of channels open to CB'ers.*

*That won't solve all the problems, says Ney Landry of the FCC in San Francisco. "I think if you give them 10,000 channels they'd still have fights."*

*The trial here has been followed*

*closely by CB'ers who are ordinarily known for filling the CB channels with lots of "good buddy" talk, and information about where the "Bears" or state troopers, are.*

*Rice is accused of deliberately running Edelman down with a pickup truck in the parking lot of a local VFW club. Edelman, 40, died three days later.*

*Witnesses agree on one point . . . the incident was preceded by an argument over a CB radio channel.*

*Edelman's widow, Sandra, testified that her husband had a running argument with Rice over the air about monopolizing a channel. She testified she had heard each man threaten the other.*

*At one time the two men had met at the home of another couple and decided to "let bygones be bygones," according to the prosecution. But on the evening of April 10, an argument erupted over the radio between the two men and it led to the fatal incident, the prosecution contends.*

*Rice testified that he and Edelman decided to meet at the parking lot. Rice said the two had an argument, and*



Long-time well-known West Coast modeler, Ray Downs, has recently liquidated the famous "Col. Bob's" hobby shop business, and gone into retirement. Now lives in Costa Mesa, Calif.



The "mean guys" (particularly the ones holding the "0" cards) at the 18th Mile High contest. Whoops! On, ahem, closer inspection of the photo, it's "guys AND GALSI!"

that he was trying to drive his truck out of the parking lot when he "accidentally struck" Edelman.

Key testimony has come from Ken Dettmann, known as "Sidekick" on the CB airwaves, and from Rene Swanson, known as "Blonde Bomber."

Mrs. Swanson testified that the two men exchanged punches before Rice jumped back into his truck and made seven or eight passes at Edelman before knocking him down. Mrs. Swanson said she drove to the parking lot with Edelman.

Dettmann, who said he was in Rice's truck when the incident occurred, testified that as Rice was preparing to drive away Edelman ran up to the truck, "twisted the mirror off and kicked the door twice. He was yelling and using vulgar language."

Dettmann said Rice waved a pistol at Edelman to scare him, then put it down and tried to drive away several times but Edelman grabbed the hood of the vehicle.

Dettmann said he heard a "thud," and told Rice he thought Rice had run over Edelman. Rice answered, "No, I don't think we hit him," and backed up.

Dettmann said he then heard another thud. "The front wheel must have drove over him again," Dettmann said.

Sounds like an excellent plot for a new series on TV's family viewing time.

\* \* \*

#### FIRST EUROPEAN PATTERN CHAMPIONSHIPS

The following report on the First European Championships for F3A (R/C Pattern), was sent to us by Joe Dible (pronounced "Die-Bull", which has no connection with Joe's ability to sling same). Joe is an airline pilot, from Ireland, and a fellow judge from several R/C Pattern World Championships.

"On arrival at Koksijde (Coxyde) on the Belgium coast, I was forcefully reminded of my only previous visit when I saw a Hunter F6 mounted at the gate, the aircraft type I landed there 20 years previously, somewhat low on fuel after a tussle over the channel. The Belgium aeroclub had been refused permission to use the main runways as this is still a very active Airforce base, so had to be relegated to the taxi strips instead, thus one of the flight circles was, to put it mildly, most inadequate, whereas the other was marginal.

"The entry on practice day had dwindled to 34, as there had been some casualties en route and the week before. One U.K. competitor had lost his only model the week before, which to me would demonstrate that the serious competition approach is missing. One



Sam Pisciotta's "Zero" gets a little dicey during takeoff at Mile High.



Dean Copeland's Waco makes a fly-by for camera. It's becoming a popular kit.

competitor I spoke to said he had lost 4 models this year and yet still had two well finished and trimmed models with which to compete.

"The organizers took the rather unusual step of using competitors training flights to train the judges as well, and we had the spectacle of the sporting director calling for his No. 1 man during training. Personally I would object.

"As is usual during practice sessions, nothing very spectacular occurred and nobody showed any real prowess. Flight line No. 1 showed the shortcomings early, with damage to retract gears as the models ran into long grass or lights.



Pitts Special, built from Midwest Products kit, by Simon Dreese, Broadview, Montana. He placed 4th in Sport Scale at Mile High.



Battle-weary "Hells Bells" P-39 from Top Flite kit, by Bob Heitkamp, Colorado Springs, placed 3rd at Mile High.

This was to prove a problem later during the competition.

"The weather remained throughout the course hot, hot, HOT! Temperatures up to 30°C (86°F), but with a sea breeze to cool the brains of the judges and to keep the competitors on their toes. Flyers were divided into groups and more than adequate time was provided by the organizers. The organization generally was excellent, and apart from flight circle problems, the whole contest ran smoothly. A total of ten judges in two groups of five were used, with the top and bottom scores being eliminated. Flight line No. 2 got the reputation early on for being the "hard lot".

"And so at 0800 on Thursday morning, with the sun splitting the heavens, the serious business of the 1st European Radio Control Championships got under way. The German team showed early, but were to be pressed hard throughout by the Italians and their superbly finished models. Certainly the Germans have a potentiality of a world champion, something which they are obviously building up to. However, on Flight Line One, many flights ended in some low landings points due to the location and rough surface, and so bad was this that the jury agreed to have the circle moved after the first round. As it was, it was impossible to allow the models to roll to a stop after landing, and this part of the maneuver was ignored by the judges.

"After 3 rounds, Hanno Prettner (Austria) was ahead, as Wolfgang Matt's (Liechtenstein) engine had stopped during the spin, and amazingly, some of the judges on the flight line zeroed the remainder of the flight in spite of his calling circuit and landing. A case of not reading or knowing the 'sporting code'.

"So it all hung on the last flight, and Matt had replaced his damaged crankshaft and seemed confident of a good motor run. Amazingly, Prettner flew an incorrect maneuver, and so ruined an otherwise excellent flight and one could almost feel the tension ease in the Matt camp. A large crowd had turned out to see these two excellent gentlemen fly and were not disappointed. Matt's



Beautiful Curtiss XP-23, built from Pete Westburg 3-views in MB, by Charlie Smith, Snowmass, Colorado. Has flown well, but crashed at Mile High. Will be future MB construction article.



Close-up of Charlie Smith's XP-23. This was the last of the famous Hawk series, and one of the most beautiful. Featured metal clad fuselage, fabric surfaces.

flight was his usual high standard, and clinched a close run contest by 305 points, precious little in a four flight competition (Hanno told me afterwards that he was concentrating so hard on his positioning in the cross wind that he flew an incorrect sequence). And so the

hardware goes to Matt, with the German team taking home the well earned team prize.

"So what of the flying generally? Some of it was a little disappointing, whilst the top men are very good indeed,

*Continued on page 102*



Mike Sadler's Twin Comanche took first at Mile High. Same model placed 3rd in 1975 Nats at Lake Charles, Louisiana.



Yes, another Big John. This one by John Hankinson (held by son, Bill), from Newtown, Pa. Recently sold to Naval ADC.



Before: "Chopper Chatter" editor poses with MRC/Kalt "Baron" helicopter kit.



After: The completed MRC/Kalt "Baron" after first test flights were completed, with Cannon single-stick R/C system. Nice rig for the limited-buck hobbyist.

# CHOPPER CHATTER

By JOHN TUCKER



## MRC/KALT BARON

• After taking one look at that brightly colored box and the in-flight pictures, I could hardly wait to get the workbench cleaned off and start on this new project. These were my first thoughts upon receiving the new MRC Kalt "Baron" R/C Helicopter Kit. The "Baron" is the very latest product of the Japanese Kalt Sangyo Company and is distributed by Model Rectifier Corp. (MRC), 2500 Woodbridge Ave, Edison, New Jersey, 08817. It features a 47 inch main rotor diameter, fuselage length of 44 inches, and weighs in between 5.5 and 6.6 lbs. Conventional 4-channel radio will operate all controls, and a .40 to .45 engine is recommended for satisfactory performance.

One of the nicer construction features

is the inverted "V" fuselage side plates, which form the basic chassis to which all other parts and components are fitted. This chassis mounts the engine and drive assembly in a manner very similar to that used on the famous "Heli-Baby," and is sturdy enough to hold a .60 engine, if you can find room for it. I might add here, that I used an old O.S. max .40, which provided plenty of power for hovering in a no-wind condition. One of the later .40 Schneurle ported engines would give more than enough power for any type of flying.

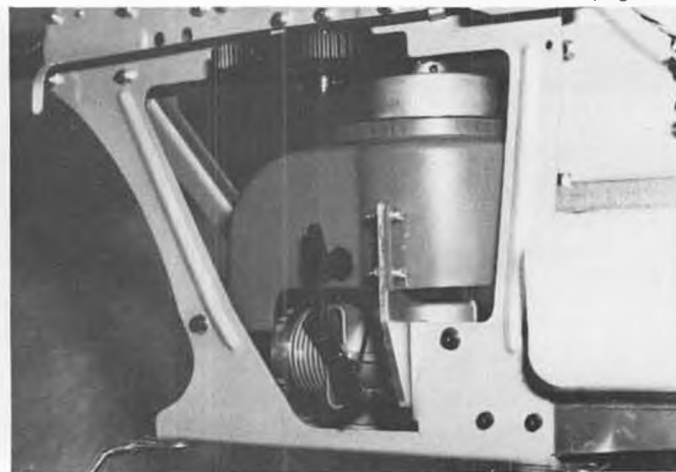
Another surprising item was the main rotor hub plate which attaches the main blades to the shaft. The hub plate is made from very thin spring steel, apparently to permit the blades to flap up and down according to unequal lift

distribution as the chopper moves into forward flight. This also insures the proper coning angle as the blades pick-up speed. When not turning, the blades have considerable droop, so it might be wise to be very careful of hard landings at low rotor RPM so as to prevent the blades from striking the tail-boom. This spring steel plate really works . . . the model exhibited an unusually high degree of vertical stability, usually attained only with a fine-tuned collective pitch. If you'll remember from last month's issue, I made essentially the same comment on the Kavan Alouette, in that it also had lots of vertical stability, probably due to the flexible blade holders. Early R/C model helicopter experiments with flapping blades

*Continued on page 66*

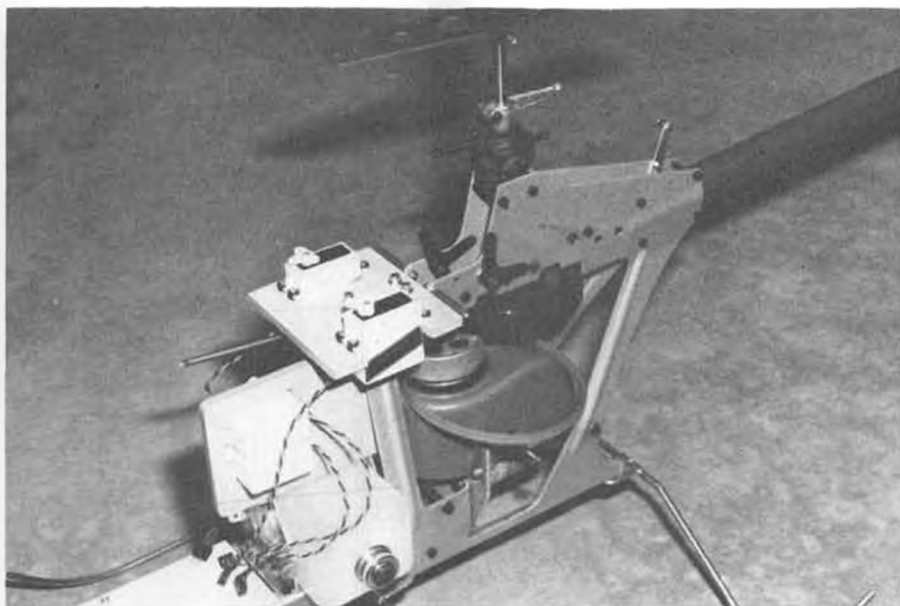


Stamped aluminum frames and formers bolted together. Clutch bell housing is in the foreground.

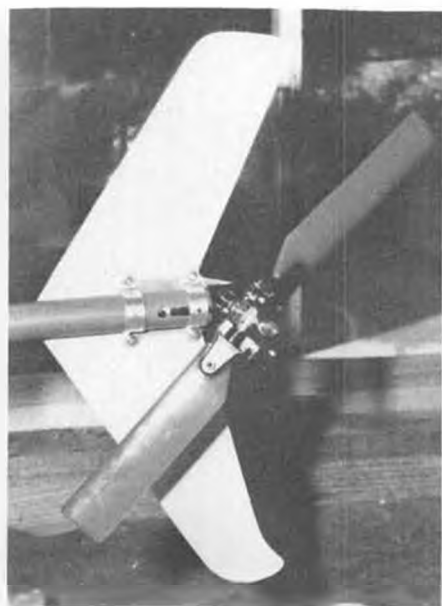


Close-up of engine installation, also main gear. Starter belt is over the pulley. Everything easily accessible.





Servos and bellcranks installed. Fuel tank (supplied) fits between formers. Note simple landing gear attachment. Follow John's suggestion on tail boom attachment.



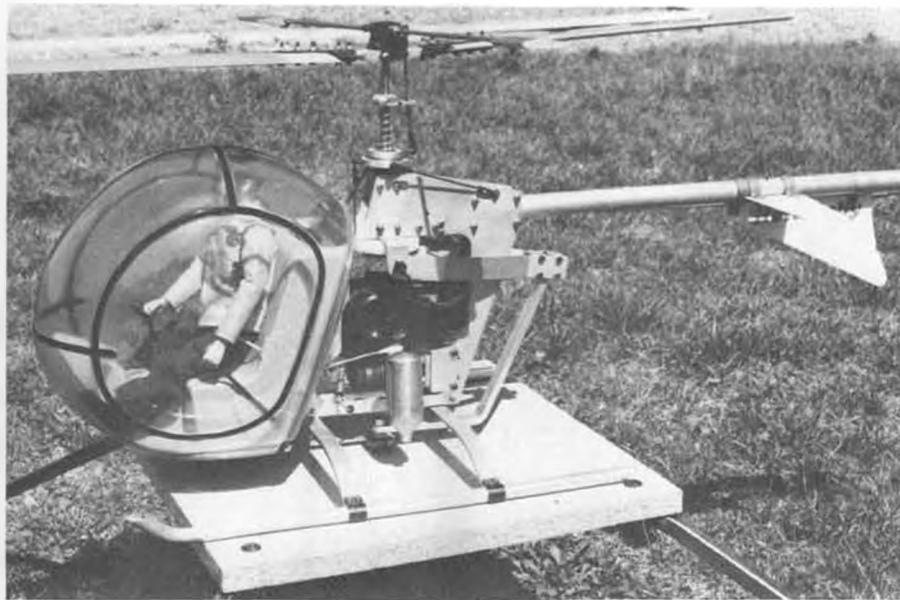
Expansion slot cut in tail boom. Holds tail rotor transmission by clamps. Plastic blades.



Flexibility of main rotor plate shows here. Also canopy attachment. Nice fit.



Not a scale-like interior, but then, the radio gear has to go someplace, and this is primarily intended to be a small, compact helicopter. Note that John installed Kavan gyro.



The Schluter/MRC helicopter training platform, with Heli-Baby in position. Yoke and platform allow uninhibited movement of chopper about axis, but it can't go anywhere, or get into trouble.



Close-up of yoke on Schluter trainer. Chopper can be mounted or demounted in minutes.



The excitement of the start shows here as releaser/caller sprints to side of pilot, as second helper waits for next wave of flag to release Ed Nobora's Mustang. Al Kuhn took photo at June 13 Quarter Midget races, Dayton, Ohio, put on by O.P.R.A.

# PYLON

**"GO FAST AND  
Turn Left!"**

By JIM GAGER

HI, RACE FANS!

● Did you hear about the Formula 1 rules proposal change as put together by Ed Hotelling? Ed proposes that we raise the minimum weight of Form 1 aircraft to 5-1/2 pounds, as a means of increasing structural safety factors. Ed feels, and I tend to agree, that in order to build an airplane down around 5 pounds, some builders might skimp on materials and thereby possibly have an unsafe aircraft. Let's hear how you flyers

feel about this. Sounds good to me, as then my airplanes would only be four ounces over the minimum weight! (*Clarification: The R/C Contest Board has not received an official proposal on this matter. wcn*)

At this time I don't know if our publisher was able to use the photo of John Fotiu of J&M Glascraft Co., and his 1/2A racer "Miss Cheap Thrills" (*You got it! wcn*). While I'm not particularly interested in 1/2A racing, I

certainly had my eyes opened when John demonstrated its flying capabilities during intermission at the June 13th pylon races in Dayton, Ohio. I was amazed at the speed that these things fly, and was also impressed by its easy handling characteristics. John also produces the successful Q-M racer "Miss Paranoia '76". This is his newest version of the first place winner at the '75 Canadian Nats, and winner of fifth place at the '75 Q-M Kentucky Nationals. John can be contacted at 30820 Mayflower, Roseville, Michigan, 48066.

ODDS, MODS, & SUCH

I've also been buying my polyester resin from a local fiberglass fabricating shop; they charge \$3.00 per quart, or \$11.00 per gallon, for medium-cure surfacing resin. They also sell a slow-cure and a fast-cure surfacing resin, but the medium cure seems to work best for what we want to do with it. It would seem to me most towns would have a local supplier where you could find a



Form 1 winners, Dayton, June 13 (l to r): Robby and Bill Hager 1st, Dave Keats 2nd, and Bill Weesner 3rd. Al Kuhn photo.



QM winners, Dayton, June 13 (l to r): Russ DeWitt 1st, Fred Najor 2nd, and Bill Weesner 3rd. Al Kuhn photo.



Subject of Product Review in text, Pro Model Products' "Li'l Toni." Lots of good finishing hints in this month's article.



QM winners, Barrington, Ill., June 20 (l to r): Dan Santich 2nd, Denis Bielick 1st, and Jim Gager (Who?) 3rd.

source of less expensive materials.

Need an adapter nut for that Rossi engine you're using? Try a 10-32 tap for re-threading a Midwest Products adapter nut. It's not the exact correct thread, but it will work. Or, if you can locate an old Super Tigre 15 crankshaft, you can cut flutes in it with your Dremel tool and a carbide disk, and use it as a tap. It's the right thread size.

#### USING POLYESTER RESIN?

Here's some useful information and safety hints when using polyester resin:

You can get polyester resin to cure over almost any kind of epoxy, by over-catalyzing it. You can also vary cure times by varying the amount of catalyst used. When resin cures, it also builds temperature and can exceed 350° F., so be extremely cautious when using more than the minimum amount of hardener. Listed below are approximate curing times for medium curing resins at

various temperatures and hardener amounts.

Were you aware you can dye epoxy glues by adding a small amount of pigmented epoxy paint? Do not use paint mixed with catalyst. It's great for repairing small dings and such where you don't wish to repaint. It takes somewhat longer to dry than epoxy mixed without paint, but that's the only drawback we've found so far.

Tired of paying four dollars for a quart of epoxy thinner? Try using DuPont's automotive lacquer thinner (3608S) or "Laco brand" lacquer thinner instead. I've been using it for years without any problems at all. Just to be on the safe side, though, run your own tests on some samples first before painting your latest masterpiece. The only minor drawback to it is that once the paint starts setting up, this type of thinner will not do as good a job as regular

epoxy thinner in removing the paint from your spray gun or hands; so don't let the paint set up too long before you begin cleaning. You can also use this thinner to thin polyester resin when applying light fiberglass cloth, and for general cleaning of brushes, etc.

Direct sunlight will also increase cure speed, and the above times are taken indoors under normal shop lighting conditions.

Based on information supplied by my local fiberglass dealer, you must observe the following for a successful repair and for safety:

1. Keep the resin, fiberglass and solvent out of the reach of children.
2. Protect your eyes from resin and hardener. If resin or hardener gets into your eyes, immediately flush with water and see your doctor. If hardener gets on your skin, immediately wash off with soap and water. Resin may be removed from the skin by the proper solvent, followed by soap and water.
3. Work in a well-ventilated area.
4. Do not work around foodstuffs or

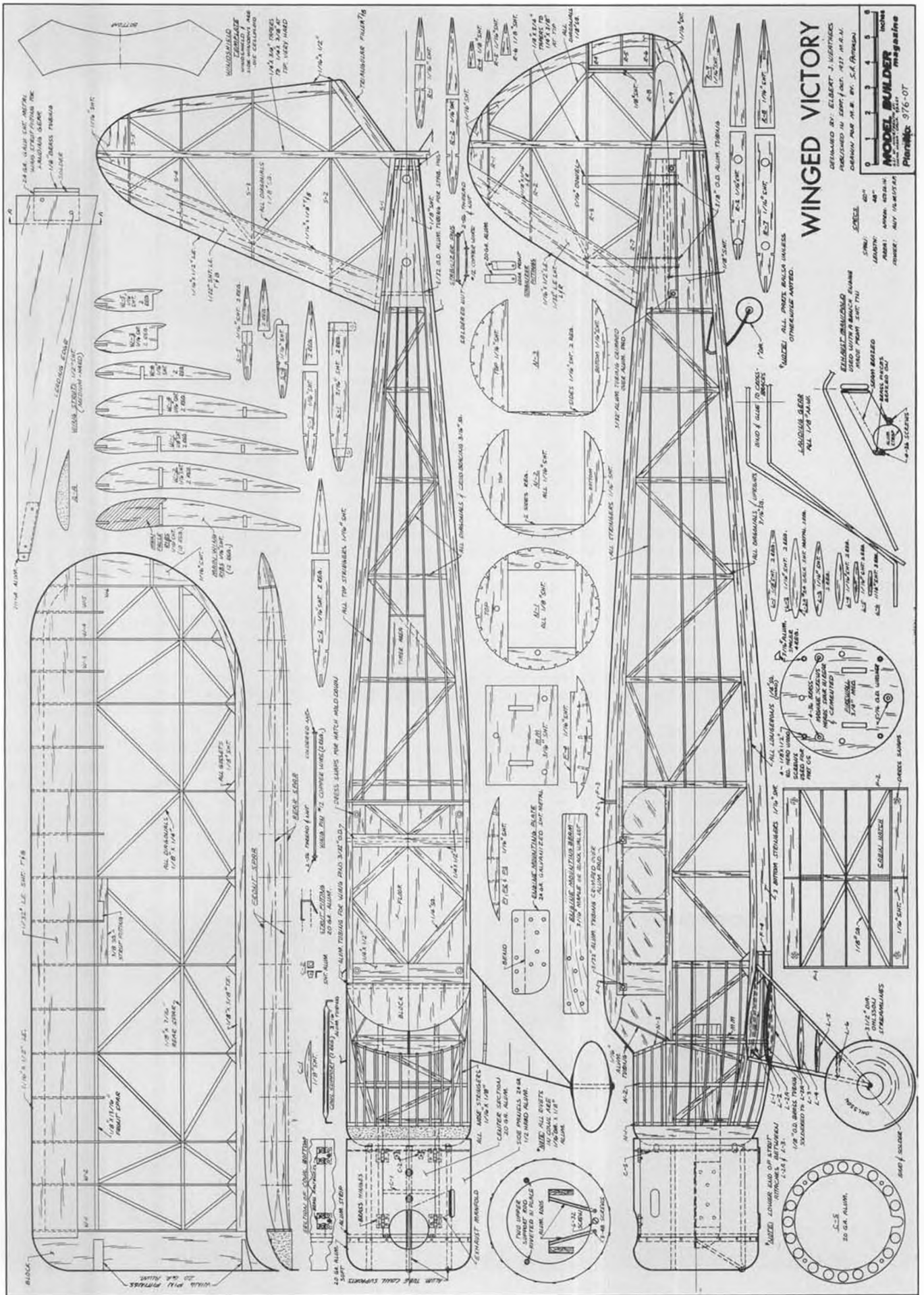
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Bill Hager repairs columnist's ST X40 after crankshaft was broken during practice flight, June 13, Dayton, Ohio. Al Kuhn photo.



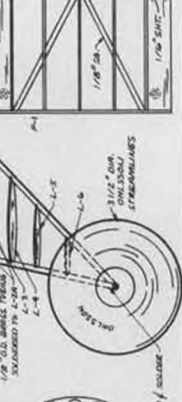
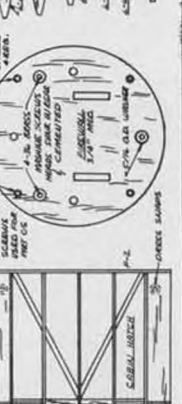
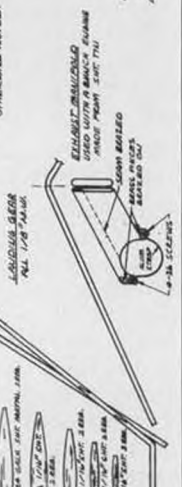
John Fotio, J&M Glascraft Co. shows off his new Half-A racer, "Miss Cheap Thrills". Dayton, May 23, O.P.R.A. See text.



# WINGED VICTORY

DESIGNED BY: EUGENE J. HERTIGS  
 DISCUSSED IN: MODEL BUILDER, FEB. 1941  
 DRAWING AND PHOTO BY: S.C. (Herman)

**MODEL BUILDER**  
 magazine  
 Plans No. 316-07





Winged Victory reveals stable platform as it circles overhead, some 39 years ago.



Ah sweet memories! Elbert J. 'Joe' Weathers and the original "Winged Victory". Photo was possibly taken at site which is now Miramar Naval Air Station, San Diego. From original negs!

# WINGED VICTORY

Classic and realistic 1937 old timer, designed by ELBERT J. WEATHERS. Article also describes "Precision Competition", an answer to our shrinking flying sites. Text by Bill Northrop, plans by Al Patterson.

● "Winged Victory" has to be one of the most intricately constructed gas models ever designed and built. In that it is the most scale-like of non-scale models, it has to compare in many ways, except for basic appearance, with Lou Proctor's Antic series.

Elbert "Joe" Weathers designed this model for a specific competition, an event that we might just take another hard look at, 39 years later. The title was "Precision-Type Gas Model Contest," and with today's shrinking flying sites, the dyed-in-the-balsa-dust O/T free flihter who complains about flying room, and the O/T R/C assist specialist who says he "ain't gonna tarn it loose without no control," may just have a common meeting ground . . . so help us Joe "No-Downthrust" Beshar!

The point system for the precision contest, as outlined in Part I of the construction article on "Winged Victory" (Sept. and Oct. 1937, M.A.N.), went

like this:

A. Engineering (20 points maximum)

1. Design
2. Construction
3. Workmanship

B. Takeoff (20 points maximum)

1. Takeoff

2. Duration (time of run?)

3. Approximate distance
4. Altitude

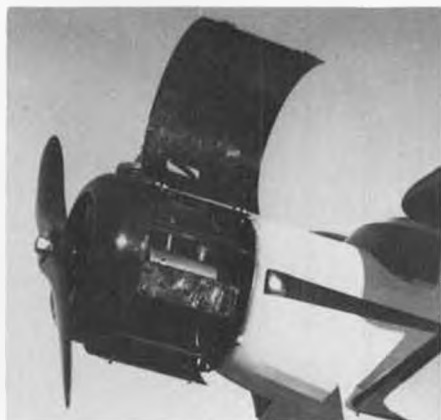
C. Flight (25 points maximum)

1. Stability
2. Performance

*Continued on page 78*



"You mean the one with the radial cowl sides swung up!" The M.A.N. photo that sticks in every old time modeler's mind. Cowl would be easier to duplicate with modern-day materials.



Close-up of hinged cowl side plate. Wing struts were functional. Very realistic looking craft.



Fuselage framework of 1937 model. Most gas models of the time were rather box-like in appearance. Note built-up fairings between front and rear landing gear struts.



Another realistic old timer model from Joe Weathers, the famous "Westerner". Joe was prompted to send us this 1937 photo, taken just after the model had been refinished in purple and white DuPont DuLuxe synthetic enamel, by Doc Mathews 60% West'ner in the April '76 issue of MB.



# PLUG SPARKS

By JOHN POND

## .020 REPLICAS O/T RADIO ASSIST!

• If the writer could put more exclamation marks, he would, as it now appears the pioneer work being done by SAM 21 in spearheading the use of radio control in the small models is now becoming the rage.

When the idea of .020 Replica R/C was first tried at the Lakehurst NAS SAM Championships in 1974, it met with little or no response. Most fellows found that 20 second engine runs were too short when using proportional gear, as compared to the Ace "Pulse".

After several successful contests sponsored by Jack Jella, that friendly proprietor of Air Trails, Inc. (air freight, etc.), who puts up good trophies, the

best rules for flying this event appear to be as follows:

(1) All flying done on the round system, in 1-1/2 or 2 hour rounds.

(2) Motor run is only restricted to what the contestant can get from 1-1/2 cc of Cox "Red Can" fuel. Fuel is provided by the sponsoring club.

(3) A maximum flight shall be four minutes. There will be no penalty for overflying the time.

(4) A 50 point spot landing circle shall be included in the point system.

The latest contest staged by SAM 21 at Hill Country (what a great place to fly!) proved the popularity of this event. Although only nine entered, the writer estimates there will be twice as many at

the next contest (including the writer).

Interestingly enough, where cabin type models (Miss America, Clipper, etc.) won all the places at the previous meet, the contest was dominated by pylon types this time. Barnett Kernoff, who was unable to get in any decent flights last time, won the event handily with all "max" flights, using a Thermal Thumber. However, he did not hit one spot landing circle, so in spite of being behind in time, all Don Bekins had to do was to hit a circle on his last flight and he would have been the winner. The tension was absolutely terrific as Don came in for his last approach, and then dropped short. Although Don couldn't hit the circle, his son (third place) hit the marker two times. Darn those young kids! As the writer has previously noted, "Youth is such a wonderful thing. Too bad it has to be wasted on young people."

For those modelers evincing an interest in this most delightful event for Old Time Free Flight with radio, a few comments are in order;

(1) Models should not weigh over



The SAM 21 "Dawn Patrol" gathers for an early-morning outing. Two Lanzo Record Breakers, what look like .020 powered Thermal Thumber and Clipper Mk II.



Bruce Chandler's "Black Knight 35" ignition conversion engine.

eight ounces. The lighter you make them, the better they fly!

(2) Use of the hottest fuel available is mandatory, if you are to get the most out of the Tee Dee .020 engine.

(3) The best size model appears to fall between 180 sq. in. wing area minimum, and 200 sq. in. maximum.

(4) Although the Cannon set is excellent, you will still have to remove the plastic case on the receiver to take off an ounce. The Ace R/C system is the lightest set, but only has rudder-only. (Generally enough!).

(5) All models should R.O.G. This really makes a meet very interesting, as .020 models do take off quite realistically.

#### MOTOR OF THE MONTH

Rubber! How about *that* for a switch? Of course, over the period of years there have been many varieties of rubber; Brown (MRL was the best) Black Dunlop, T-56, Pirelli, Filati, etc. Most of the old timers will remember with considerable fondness the winds and power you could get out of the old Brown rubber marketed by Carl Goldberg under the name of MRL (Model Research Lab). Records were set every meet. It was great while it lasted.

After the war, U.S. Rubber came out with a brown rubber thread known as T-56, but it simply didn't have it. Whether it was in the production, lack of aging, or not understanding how to handle the rubber, T-56 fell into disfavor and black rubber Pirelli replaced it. Truly a shame the home product was shelved, as the black rubber takes all sorts of precautions when handling and winding.

Later on, Duke Fox came out with some brown rubber, but by this time, the demand simply wasn't there, as the number of rubber powered modelers had dwindled to a relative handful. Rather than a technical discussion on the thickness and number of threads available, we are going to talk about the use of rubber power itself.

Thanks to Phil McCary of the SCIFS, we have an excellent dissertation on the hows and whys of rubber motors. As you read what Phil has to say, you will find the contest is won or lost before you even come to the field.



Winner of the SAM 21 Texaco Contest at Black Point, Nick Nicholau's Super Buc gets wheeled off by grandson Ronnie Rollins, who has also registered a 22 minute flight.

As originally reported in the SCIF Flight Plug, rubber motors cannot be wound to maximum turns without proper break-in. The black rubber, Pirelli or Filati (ugh!), develops shearing stresses that have been known to break at less than 50% winds. This assumes 18 turns per inch is *not* followed. With the price of rubber nowadays, everyone is interested in preserving the life of the motor.

Phil says that when he makes up a new motor, he breaks it in by pre-stretching the motor five times its length, holding the pre-stretch three minutes each time. The conventional method of break-in is to stretch and wind the motor, increasing the turn count by 10% each time until you reach maximum turns. As Phil points out, this means numerous windings that slowly wear the motor out.

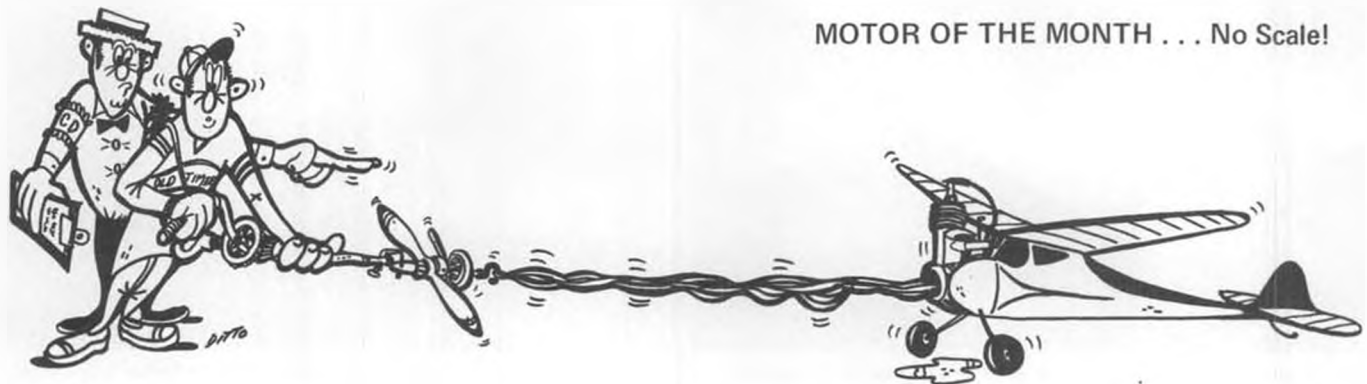
Under Phil's system, he only winds motors to 85 or 95% of their capacity. He seldom uses the motor over five or six times. In many contests, McCary won't use a motor that has had over three maximum windups. That's being just plain careful! One other bugaboo that bothers Phil is winding in the sun.



Sally "Pudge" Armstead with poppa George's Struck Apache. Even has retract gear per scale.

McCary feels this reduces the number of safe turns and naturally increases the possibility of breakage.

For rubber lube, McCary says you can't go wrong with the old standby, a 50-50 mix of green soap and glycerine. The mix should be heated prior to use to drive off the alcohol. This is a good lubricant, but it does dry out quickly.



MOTOR OF THE MONTH . . . No Scale!



So this is what a Scientific Hornet looks like! Stan Fink, Oregon, sent this to publicize his Hornet Postal Contest.



Bill Squires, with his .020 Replica Clipper Mk II, with pulse rudder by way of Ace R/C, a fun type of airplane.

For those who like neatness, this lubricant does not fit the bill, as it flies off the rubber and spackles the inside covering of the model. McCary is partial to a rubber lubricant composed of a 50/50 mix of K-Y surgical jelly and glycerine. K-Y is readily available in drug stores and is water-soluble. The mix is better in that it does not spatter the fuselage like the green soap combination.

As a side note here, inasmuch as both of the foregoing mixes are water-soluble, the inside of the fuselage can be washed out with hot water and dried with a hair dryer. This method requires care, and that the interior of the fuselage is doped before use of a rubber motor.

Phil McCary feels the best rubber lubricant he has run into is silicone lubricant. This material can be bought in spray cans or in standard cans (not under pressure). This silicone is manufactured by Dow Chemical and Borden Products. Each is excellent. The material is inert, will not rot the rubber motor, has a lower frictional contact with rubber-to-rubber, will not dry out, and best of all, does not splatter all over the inside of your fuselage.

McCary concludes by saying that although the silicone is not water-soluble, the rubber motor can be cleaned of grit by rinsing in cold water. With the

silicone being lighter than other lubes, (no water base), the modern flyers are presented with an advantage of knowing what the rubber motor will weigh under any circumstance. You don't have to weigh your rubber after lubricating, as with the other systems.

It is interesting to note that when the motor is lubricated with silicone, the edges do not appear to nick up badly under maximum winding. With less friction indicated, motors will last longer. For maximum motor life, take out all pre-winds after a day's flying, rinse the rubber in cold water, and let dry. Tag the motor indicating how much usage it has had. Place in a "baggie" and store in a tin can in a cool place. The refrigerator is the best place if you can get the franchise rights from the better half!

All comments or questions on the care of rubber motors should be directed to Phil McCary, 9570 Wilshire Blvd., Beverly Hills, CA 90212. After all, how are you going to learn if you don't have an exchange of information?

This columnist also notes that another method of rubber break-in is to take the completed motor and stretch it between two nails about four times the original motor length. This is left for three days, to achieve permanent stretch (break-in). Accordingly, it may be wound

to capacity immediately thereafter. Motors will last a season if kept clean of grit and a 24 hour rest is allowed between maximum windings. Carry lots of spare motors!

#### THE "NO-DOWNTHRUST" CONTEST

Well, the "Old Timer Bash" as staged by Joe Beshar, has come and gone and even Joe had to admit the idea of no downthrust was a bummer. The entries weren't that great, and a few casualties did occur.

The no-downthrust rule was obviated somewhat by a last minute ruling by Beshar which allowed the contestant to fly with down-elevator. An adjustable contraption, which was fitted to the elevator stick on the transmitter, allowed the contestant the option of putting in as much down elevator as he wanted for power (That's just a gimmick to get around downthrust!).

After the power shut-off, the gadget can be left on (for windy days) or removed. In any case, the model is timed as long as it is left in a free flight state. When the transmitter is employed, the time stops. Kinda like Russian roulette. You decide how far your model can drift and still get back to the field to qualify for an official flight (all official flights must land in a designated area).

*Continued on page 99*



George Dickinson, Somerville, N.J., built this Buccaneer 'C' Special. Bonded ignition system (from MB) doesn't bother 3-channel Kraft.



Arnold Hernandez' Powerhouse takes off at Joe Beshar's O/T Bash, Lakehurst NAS.





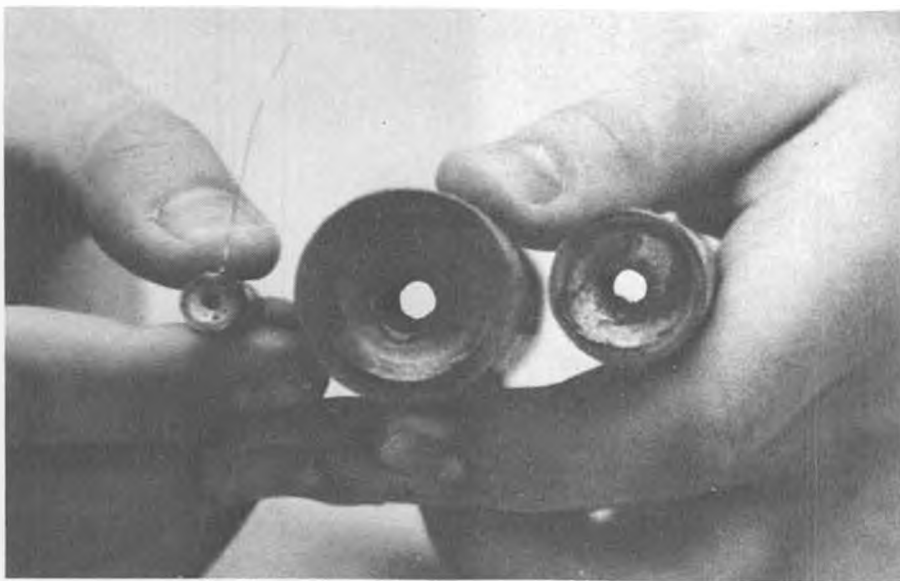
## A LOOK AT **MODEL ROCKETRY**

By DOUGLAS PRATT . . .

• In response to some queries, we're going to enlarge on material we presented last May concerning model rocket engines. We've had questions concerning the range of engines available from



Jim Tucci's fine Aerobee 300 scale model at SMCC-2. Note scale grey patches! CAPCOM.



Relative diameters of various AVI model rocket engines. Left is "mini" engine; center, an F engine; and right, an E11. Photo by CAPCOM Model Rocket Journal.

American modroc manufacturers, as well as queries about using the smaller engines, since they are most widely used in competition. Well, we'll try. Some of the information may be out of date by the time you read this, and we're sure that some competitors who beat the star spangles out of us at meets will be sending hate mail. Go ahead, guys . . . it'll get printed.

To begin with, model rocket engines are something to be proud of; precision instruments, simple to care for and use. Their reliability is incredible, considering that over 40 million of them have been fired. As with any manufactured item, defects happen; but the manufacturers are all very good about replacing defective merchandise, probably because it doesn't happen often. Incidentally, you will note that on the instructions (or somewhere around the package) for the engines you buy, there is a statement called a disclaimer; this means that the manufacturer cannot be held responsible for the use to which the engine is put, but is obligated to replace it, if it is shown to be faulty. You can't blame the manufacturers for this bit of self-defense; and since rocketry has still

*Continued on page 83*



Astrobee-D scale model lifts off at Florida SMCC-2 meet. Power is F100 engine. CC.



(l to r): Three professional sounding missile engines by FSI; FSI 'Thunderbolt'; another commercial motor; five FSI model rocket engines; an Estes D12-5; Estes C6-5; and AVI 'mini' B3-5m.



Interesting photo angle of huge (168 inch span) Kestrel sailplane, by Ralph Learmont, from Australia. It's available in kit form. See text.

# R/C SOARING

by Dr. LARRY FOGEL.

• Randy Warner has been designing his own sailplanes for many years . . . each an improvement over the last. He's long been concerned with thermal duration, but lately has been focusing on the need to pick up low altitude thermals so as to overcome the need for a launch mechanism. He runs a few steps and throws his sailplane into the air, circling some hundred feet in hopes of finding lift (or at least zero sink.) I have seen some remarkable success. Fifteen minutes after the launch, he's almost out of sight amongst the clouds. His latest design, called Sundance, is of 9-1/2 foot wing span, the wing composed of three sections. The center section bolts onto the fuselage, and contains the nine inch long spoilers and guides for the lines required to actuate them. The root chord is 8-1/2 inches, tapering to a six inch chord in the outboard polyhedral section. The airfoil is 8-1/2% thick at the 38% point. Randy uses curved up

tips, but admits these are mostly for decoration.

As designed, the fuselage is very thin, just enough to take the three servos in tandem. The fuselage is fifty-four inches long. It's sleek and provides considerable lateral area, helping it "groove." Ready to fly at about thirty-five ounces, it can be ballasted to about four pounds (but I see no need for going to that extreme). Infected by the Bicentennial spirit, this prototype is covered with red, white and blue Monokote. Randy is now preparing full scale plans for this bird, which can be obtained by writing directly to him at 7777 Roseland Place, La Jolla, California 92037. Please enclose your check for \$3.

Another aircraft is worthy of your attention. This scale Kestrel is now available in kit form by writing Ralph Learmont, 31 Queens Parade, Burwood 3125 Melbourne, Australia (that's right, I said Australia). The aircraft is a sleek

beauty, with 168 inch wing span (about 14 feet) and 1,138 square inch wing area (almost eight square feet), a 25 to 1 aspect ratio wing, which tapers from nine inch root chord to four and one-half tip chord. The airfoil varies for each section. The root section is 14% thick "biconvex" with undercamber at the trailing edge. The intermediate section is 11-1/2% thick and has less camber. The tip section is 9% thick, flat bottom, with 3-1/2 degree geometric wash-out. The planform is double taper. The dihedral is 4 degrees unloaded. The fuselage is almost 67 inches long. The primary controls are elevator, rudder, ailerons, and spoilers, but flaps, retractible wheel, and retractible tow hook are also possible. Ready to fly, this sailplane weighs between 7.7 and 8.4 pounds. That is a wing loading of 15.6 to 17 ounces per square foot. Wow! That's a lot of sailplane.

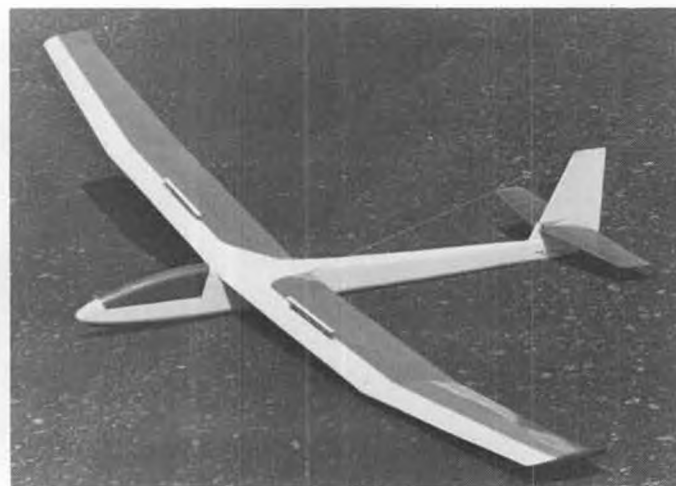
The kit comes complete with an extensive hardware package, trimmed plexiglass canopy, and white gel-coated fuselage. Materials for the "optional" functions are not included, but anyone



Ken Banks installed spoilers on his Hobie Hawk.



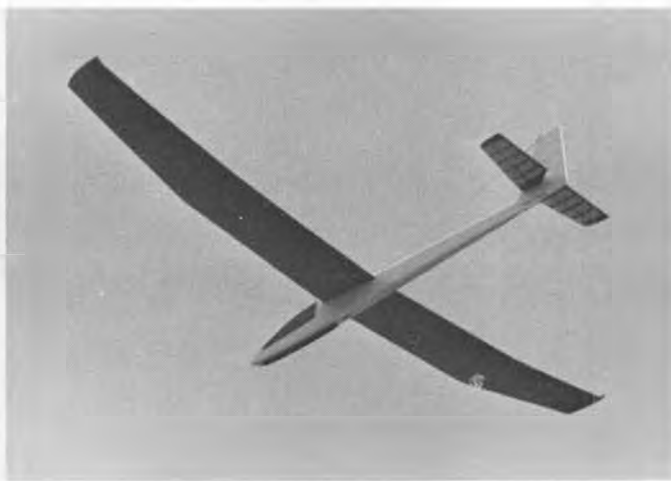
Randy Warner brings his Sundance in on final, or for another hand-catch. Span is 9-1/2 feet.



Sundance with spoilers extended. Thin fuselage takes three servos in tandem. Randy gets thermal hops from hand launches!



Obviously not Southern California, with all that vegetation! Author took photo at Pittsfield, Massachusetts affair.



Another shot of Sundance, as it soars overhead. Plans available from Randy. See text.



Randy Warner and Sundance. Okay, that's enough free plugs for one issue!

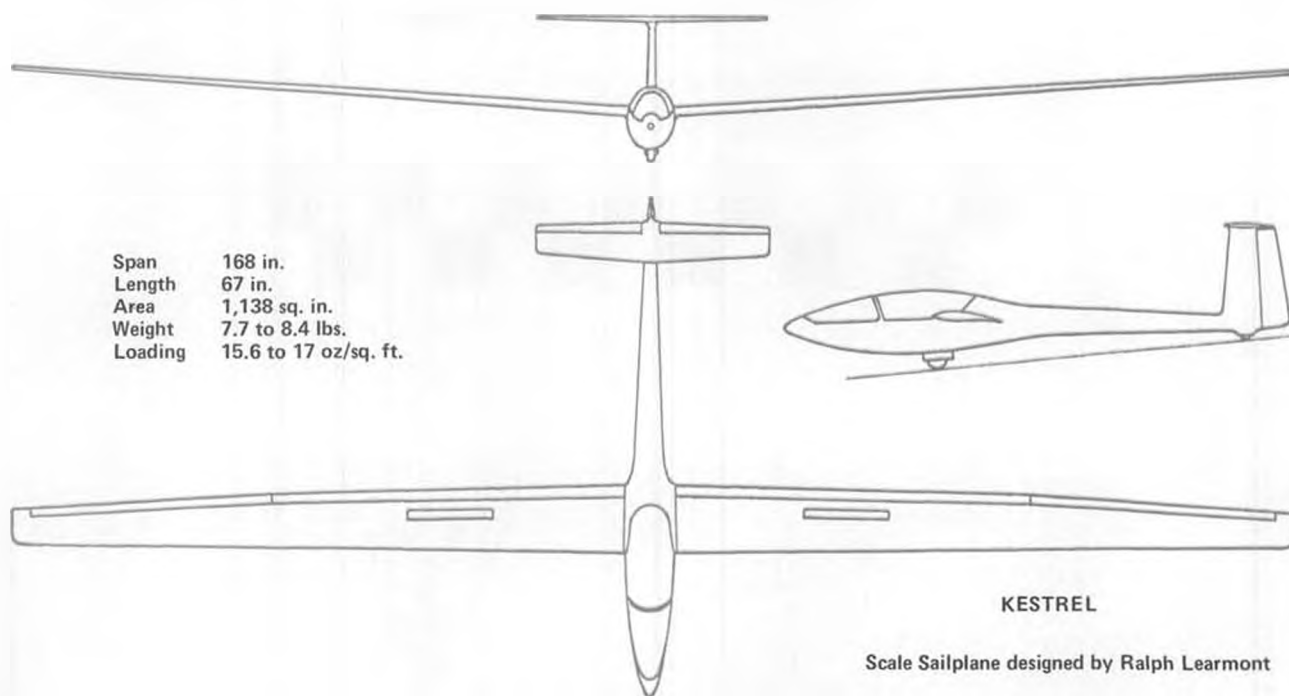
capable of building this machine should be able to include these features if desired. The wings are of one-piece construction. Before buying the kit, make sure you have a sufficiently long building board and that your "Volkswagen" can handle this 6 foot 4 inch length. Ralph includes a 98 page instruction manual, so you won't feel alone even though he's 9,000 miles away.

He tells me the basic price of the kit is \$139 (Australian dollars, that is). Air freight costs about 72 Australian dollars and takes about one week. Here's a kit I look forward to receiving. I expect this aircraft will fly extremely well off the slope and cross-country, once it gains sufficient altitude. It may be difficult to catch those small thermals near the ground, and you will need a heavy Hi-Start or fully charged winch to get it up to a reasonable altitude for flat land flying, but the beauty of this

*Continued on page 95*

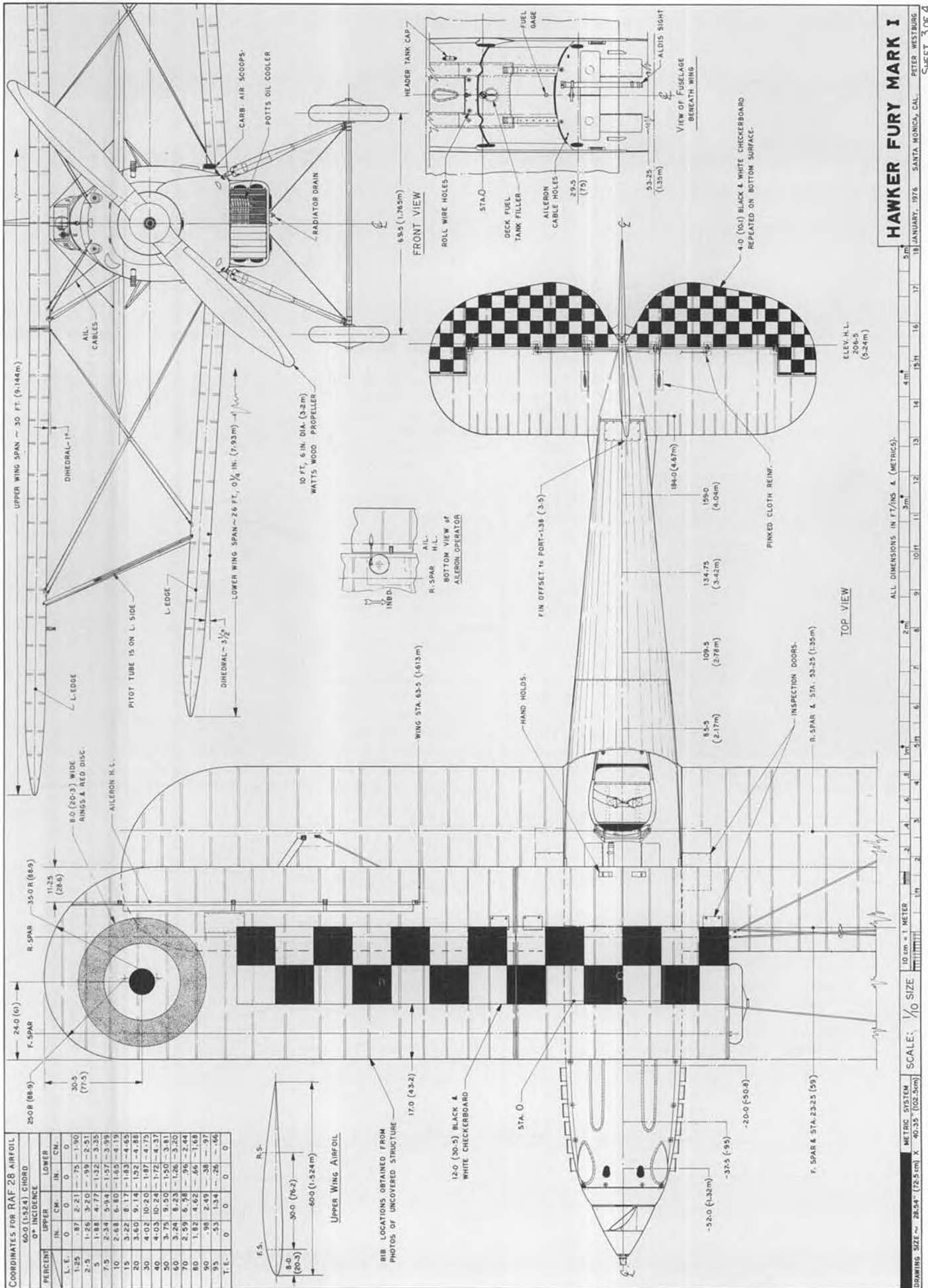


Alex Mladeneo added one inch of chord to his Windfree. Seemed to improve performance.



COORDINATES FOR RAF 28 AIRFOIL

PERCENT	60° INCIDENCE		CHORD	
	UPPER	LOWER	IN.	CM.
L. L.	0	0	0	0
1.25	.87	2.21	.75	1.90
2.5	1.26	3.20	.99	2.51
5	1.88	4.77	1.32	3.35
7.5	2.34	5.94	1.57	3.99
10	2.68	6.80	1.85	4.19
15	3.22	6.17	1.83	4.65
20	3.60	5.14	1.25	4.88
30	4.02	10.20	1.97	4.75
40	3.79	9.50	1.50	3.81
60	3.29	8.23	1.26	3.20
70	2.59	6.78	.96	2.44
80	1.82	4.62	.65	1.68
90	.98	2.49	.38	.97
95	.53	1.34	.26	.66
T.E.	0	0	0	0



**HAWKER FURY MARK I**  
 PETER WESTBURG  
 18 JANUARY, 1976 SANTA MONICA, CAL.

ALL DIMENSIONS IN FT/INS & (METRICS).

SCALE: 1/10 SIZE  
 10 cm = 1 METER  
 DRAWING SIZE ~ 28.5" x 40.35" (72.5 cm x 102.5 cm)

METRIC SYSTEM

ELEV. H.L. 206.5 (52.4m)

10 11 12 13 14 15 16 17 18 19 20

10 11 12 13 14 15 16 17 18 19 20

10 11 12 13 14 15 16 17 18 19 20



A pristine, ex-factory Mark II Fury. Most obvious difference was the addition of wheel spats, but the engine was a 640 hp Kestrel, in place of the 525 hp engine in the Mark I.

# The HAWKER FURY

**PART TWO**  
(Conclusion)

By **PETER  
WESTBURG**

• Though the Mk I Fury was an excellent interceptor, its performance was greatly improved with the installation of a higher horsepower Kestrel engine. To demonstrate this, Hawker went ahead with the PV-1, (Private Venture), a Fury airframe with ballast in place of the machine guns and ammunition. Several successively higher horsepower engines were tried out, and the airplane was also fitted with wheel spats at the request of the Yugoslav delegation.

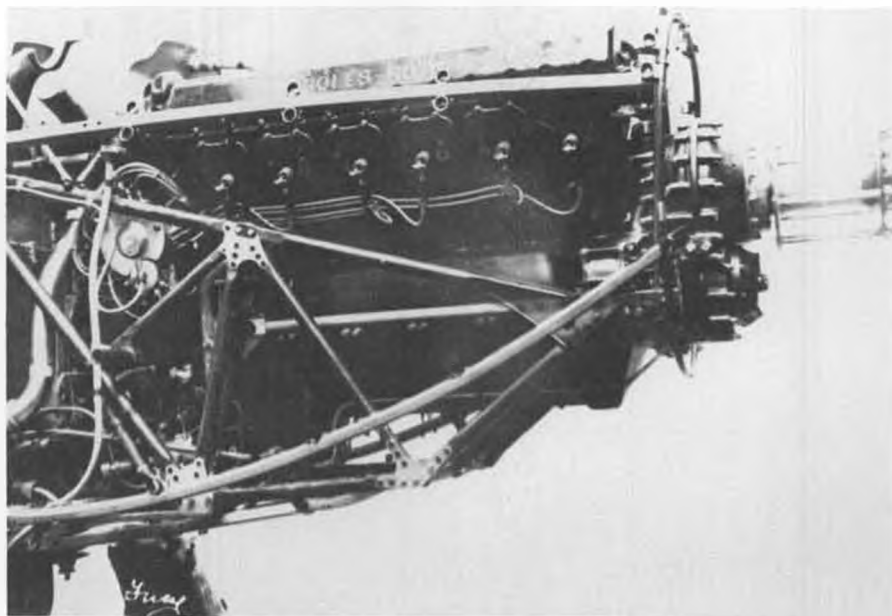
The Mark II Fury went into production with the 640 hp Kestrel and the wheel spats. Spats off, it is nearly impossible to tell the difference between the two models. The control surfaces on the Mark II were counterbalanced, and an additional cooling scoop was located under the engine for cooling the crank-

case, but the two airplanes were near twins.

The top speed went from 207 to 223, but the increase in rate of climb, the real measure of performance in an interceptor, was truly remarkable. The gain was 34% . . . from 2380 fpm to 3200! Production of the Mk II began with 23 in late 1935 and early 1936. Most went to refit No. 25 Squadron, which, along with No. 1 and No. 43, were the only RAF squadrons to fly the Fury operationally. An additional order for 75 airplanes was filled by the General

Aircraft Co., the Hawker Co. being too busy on a new monoplane to handle the production. Three more squadrons, the 41st, 73rd and 87th, were equipped with the Mk II's; many went to training schools, some into storage and some to the South African Air Force.

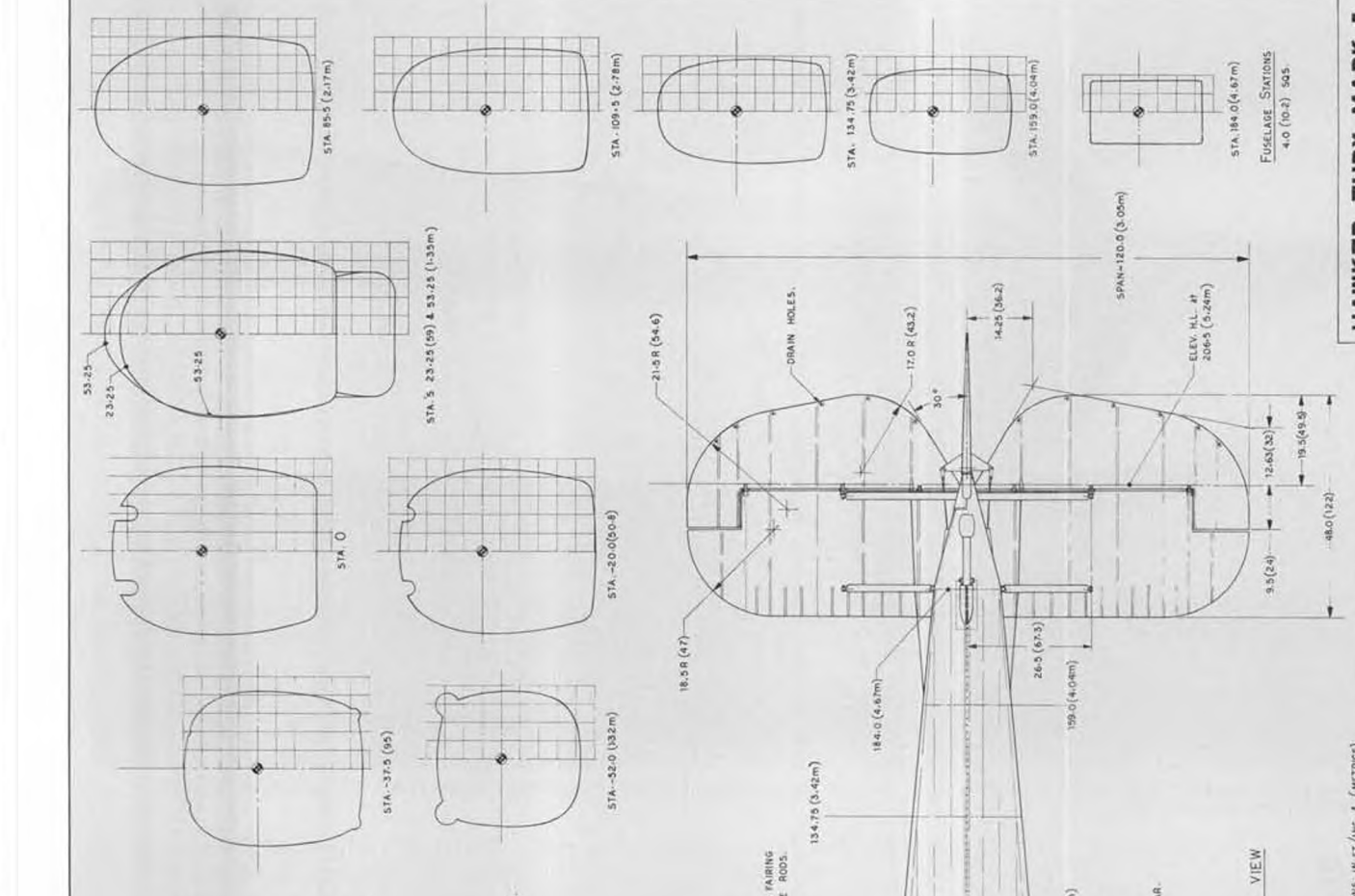
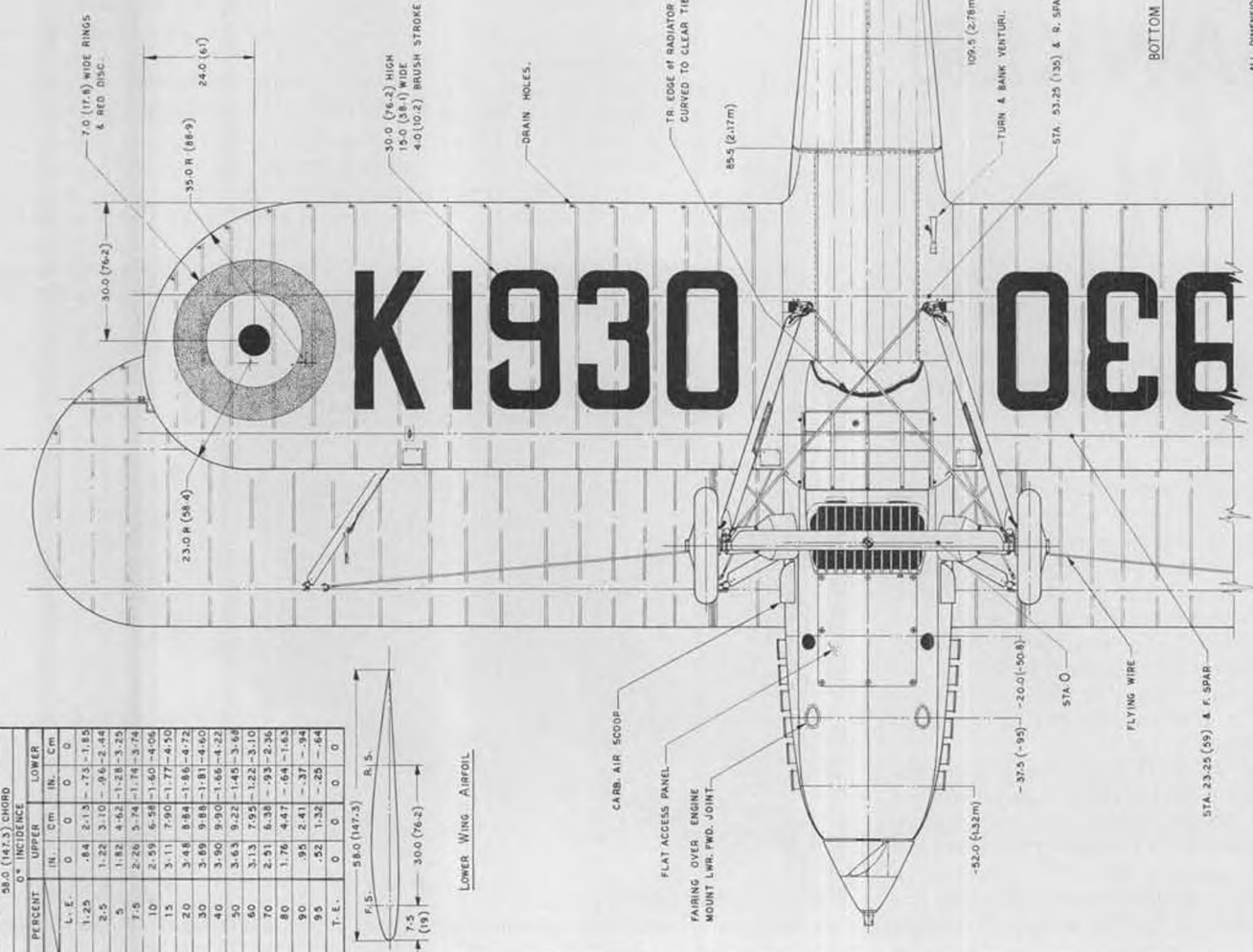
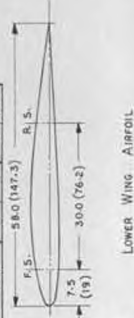
The day of the biplane fighter was ending rapidly and inexorably. In October of 1933, just as the Fury was entering its prime, Sydney Camm and his engineers began work on a Fury monoplane. Scheduled to be powered by the evaporative or steam cooled version of



Rolls-Royce Kestrel was developed from Falcon engine of WW I Bristol Fighter, and was direct ancestor of famous WW II Merlin. Large tube at left is waterline from header tank to radiator.

**COORDINATES FOR RAF 28 AIRFOIL**

PERCENT CHORD	58.0 (147.3) CHORD		58.0 (147.3) CHORD	
	INCIDENCE		INCIDENCE	
	UPPER	LOWER	UPPER	LOWER
	IN.	CM.	IN.	CM.
L. E.	0	0	0	0
1.25	.84	2.13	-.75	-1.85
2.5	1.22	3.10	-.96	-2.44
5	1.82	4.62	-1.28	-3.25
7.5	2.26	5.74	-1.58	-3.74
10	2.58	6.54	-1.80	-4.06
15	3.11	7.90	-1.77	-4.30
20	3.48	8.84	-1.86	-4.72
30	3.89	9.88	-1.81	-4.60
40	3.90	9.90	-1.65	-4.22
50	3.63	9.22	-1.45	-3.66
60	3.13	7.95	-1.22	-3.10
70	2.41	6.38	-.93	-2.26
80	1.76	4.47	-.64	-1.63
90	.95	2.41	-.37	-.94
95	.52	1.32	-.25	-.64
T. E.	0	0	0	0



**HAWKER FURY MARK I**

19 JANUARY, 1976 SANTA MONICA, CAL. PETER WESTBURG  
 SHEET 4 OF 4

ALL DIMENSIONS IN FT./INS & (METRICS).

SCALE: 1/10 SIZE  
 DRAWING SIZE ~ 28.5" (72.5cm) X 40.35" (1025cm)  
 METRIC SYSTEM  
 10 cm = 1 METER  
 1 in = 25.4 mm

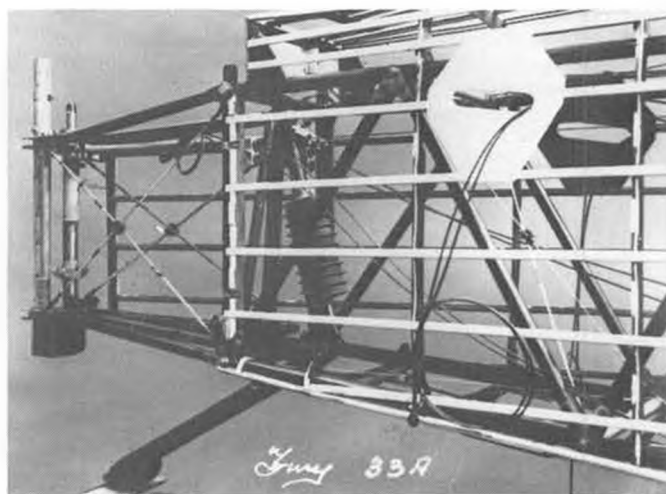


K7275 was 13th Fury II and went to No. 43 Squadron. Note that red, white, and blue vertical stripes had disappeared from rudder. It was about this time, 1935-36, that the famous and classic WW I rudder identification began to vanish from British aircraft.

the Kestrel, the Goshawk engine, a historic change was made in January of 1934. A new engine, the Rolls-Royce PV-12 replaced the Goshawk, and at the same time the name of the airplane was changed to Interceptor Monoplane.

On the morning of November 6, 1935, two years after start, the new airplane flew into history for the first time to become the Hurricane, powered by a Merlin engine.

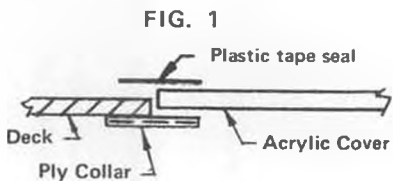
The basic color scheme of the Fury in fighter squadrons was aluminum dope on fabric surfaces and highly polished aluminum panels. Squadron and commander aircraft markings were varied and colorful, the checkerboard shown on Squadron Leader Slatter's Fury being among the most distinctive. For these and other markings, see Profile No. 18 and Munson's, Fighters, 1919-1939. ●



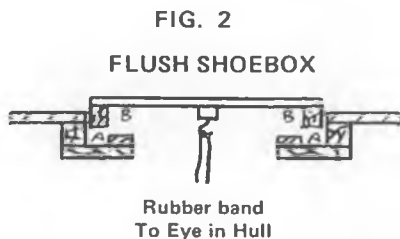
Tail end structure of Fury was conventional, bolted aluminum tubes, squared at joints. Tailskid sprung by compressing rubber discs.



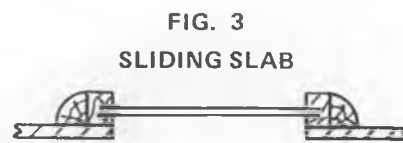
G-ABSE was Hawker PV-1 (Private Venture) Fury, built to test upgraded Kestrel engines, wheel spats, and other mods which led to the Fury II and many export Sales to Spain, Portugal, Yugoslavia, Greece, Persia, and Norway.



FLUSH DECK HATCH COVERS



YANKEE SHOEBOX



Fitted Pop-Top

Laminated Pop-Top

# STRICTLY SAIL

By ROD CARR

• I am often asked why I spend so much time on the 50/800 class. The answer is simple, that is where the activity is. Lots of boats sailing, lots of people building . . . but most importantly, lots of folks willing to share their ideas in

order to improve our hobby. This month, all the way from "down under", I am pleased to feature a new 50/800 design, never before published, by Adrian Brewer. He offers for sale his design services, so if you wish to have a specific hull idea exploited on his drawing board, contact him directly at 6 Queens Square, Sandringham, Victoria 3191, Australia. He has in stock plans for a number of A-class designs, as well as other 50/800's, which cost in the four to five dollar range.

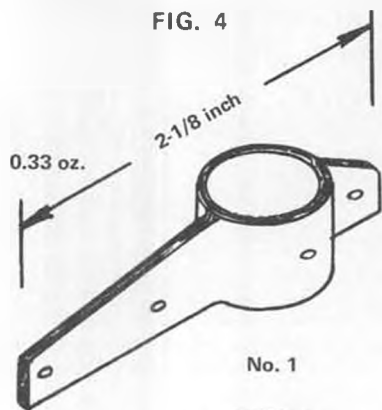
His SONIC BOOM II has won the 1975 Australian Championships which is about as good a recommendation as one can have. We all owe Adrian a debt of gratitude, since he has released this design with no strings attached.

There is no one better qualified to comment than the designer himself and

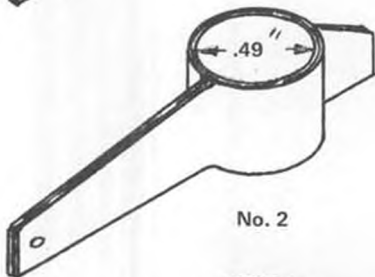
here is what he had to say about SONIC BOOM II:

"The lines of Sonic Boom II are the latest result in a family of designs beginning in 1968.

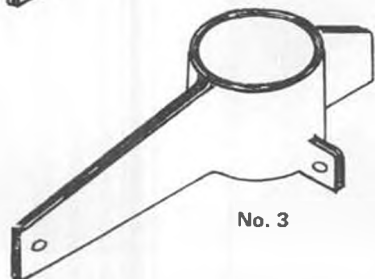
"At that time, I received a private commission to design a boat to a specific set of requirements which included narrow beam and canoe stern. This concept did quite well in vane competition, and two variations on the one theme evolved, but after watching the boats compete in various conditions, I concluded that several improvements could be made. I then re-drew the lines by spreading the beam by 1.5 inches and incorporating a narrow transom which increased displacement to around 17 lbs. This boat was almost unbeatable to



No. 1

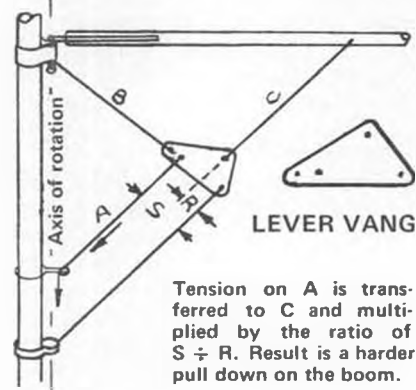


No. 2



No. 3

J. G. Products Masthead Fittings



LEVER VANG

Tension on A is transferred to C and multiplied by the ratio of  $S \div R$ . Result is a harder pull down on the boom.

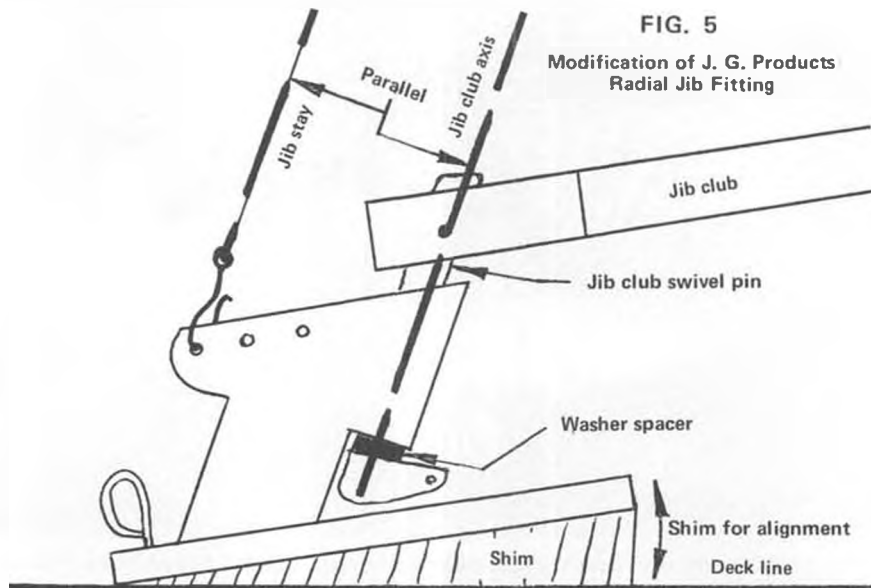


FIG. 5

Modification of J. G. Products Radial Jib Fitting



windward and reaching, but on a square run was very mediocre.

"A further re-think was necessary, and the new lines resulted in Sonic Boom. This boat was given a much flared bow (which gained it the name 'Aircraft Carrier') reduced rocker and fuller stern, resulting in a slightly wider transom. Incidentally, I notice with interest that Chris Dicks, a top English designer, used an identical bow in his recent 'Illusion' design. I was almost there . . . very fast to windward and she could really move downwind. But downwind there was still one problem . . . the way she approached a wave in a wind gust determined whether she rapidly planed away or went through the wave and continued at full speed underwater, irrespective of the bow flare! This could be cured under vane by a well-cut lifting spinnaker, but it was not good enough for radio.

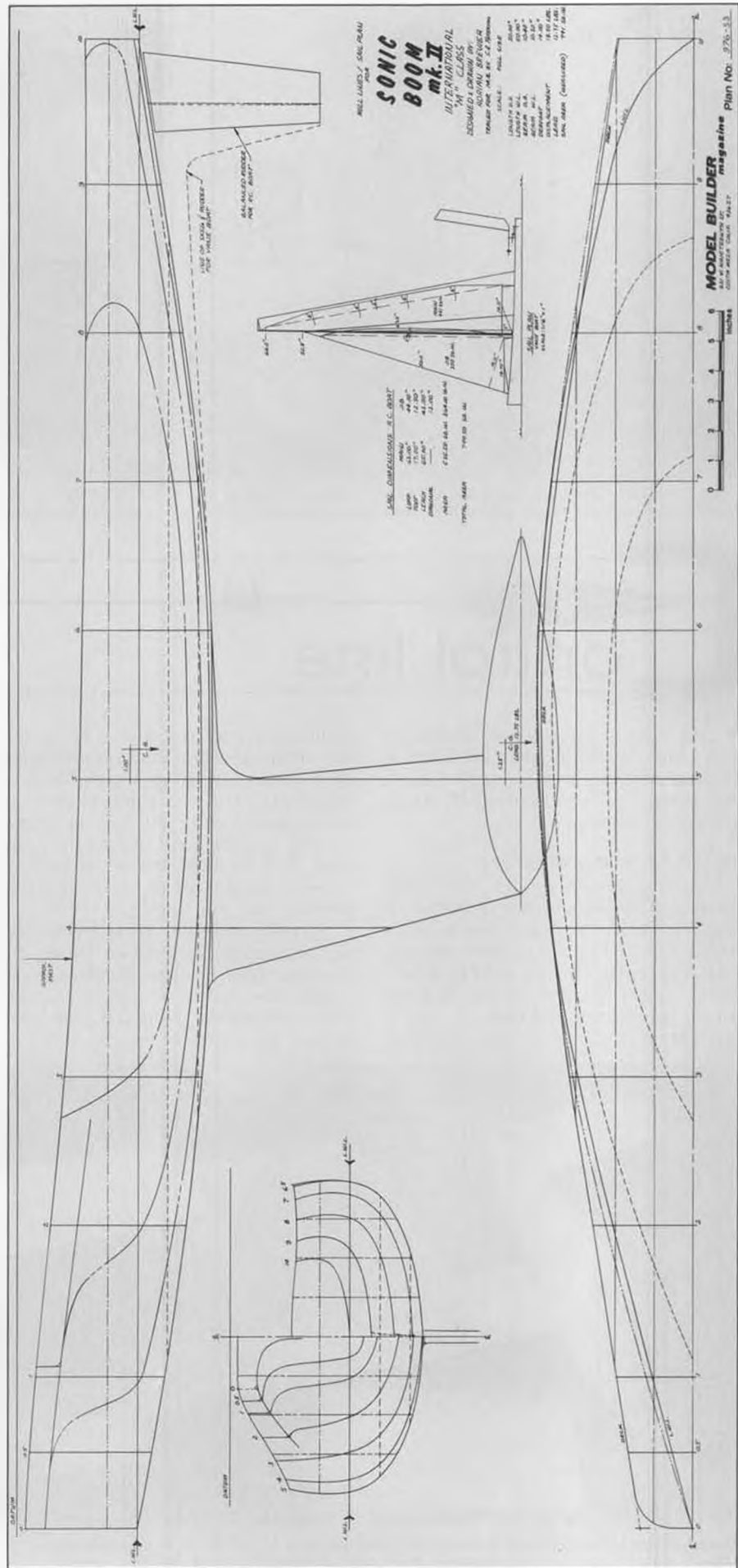
"Nevertheless, she had good success in competition with a 4th in the 1974 Australian Championships and winner in 1975. She also won the Victorian State Championships 1975 and never lost a Club event. Needless to say I was delighted!

"Sonic Boom II is a direct development of this boat, but more suited to radio. The underwater volume of the hull was slightly re-adjusted by widening the stern and filling out the bows slightly, which raised the displacement by 1 lb. The flared bow was maintained, but raised another inch to try and prevent the nosing which the former design was prone to do. These small alterations improved the design and I can confidently recommend her to anyone wanting a fast 'RM'. I have produced her in fibreglas in Australia and there are many now sailing.

"I am fortunate that the current Australian 'RM' champion is from my Club (Albert Park Model Yacht Club) and he is a good-yard stick for my own design. His boat, 'Fes Gee', is very similar in general appearance to the Swedish boat which won at the recent International event in England, and performance would seem to be similar. His best win at the Australian Championships was over 5 minutes ahead of the second boat home (fleet racing over a triangular course of approximately 500 meters and light winds), and his worst win was 2 minutes 55 seconds. Naturally, he won all races. Sonic Boom II is quite capable of beating 'Fes Gee' over all except drifting wind conditions, and Sonic Boom II has just won the 1976 Club Championship, with 'Fes Gee' second.

"She planes well and easily under working sails, and is very fast to windward. In fact, in Club handicap races she easily beats the 'RA' boats around the course.

"If any readers decide to build her,  
Continued on page 79





Gene Pape starts his Fox Combat Special. Charlie Johnson waits to launch. Gene a prime mover behind N.W. Regionals. Lopez photo.



Part of the Jive Combat Team (l to r): Gary Stevens, Ron Scoones, and Phil Granderson. Howard Rush photo.

# Control line

By "DIRTY DAN" RUTHERFORD  
PHOTOS BY AUTHOR UNLESS NOTED

• Still have a ways to go on Project G/Y, but I'll slip in whatever I can at the end of this column, as there are a few things I've been putting off, due to the Project plane.

## HI THERE, JOHN WORTH

When in Anaheim for the MAC Show a while ago, I had a chance to meet John Worth, Executive Director of the AMA. Hardly a planned meeting, I was looking for "The Kansas City Star", J. T. Finley (Homer Smith told me Finley was buying the beer . . . and I was checkin' it out). I came whipping

around a corner and into a patio-style area in the Anaheim Convention Center. And there was John Worth. Now, I figured, the day was about to come to an unpleasant end right then and there. I could just see John ordering the District VP's to hold me while Johnnie Clemens chewed off my ankle (Johnnie isn't very tall, you know).

Surprise, surprise, John Worth was pleasant enough, we shook hands, exchanged rather bland small talk, and did a little introducing of mutual acquaintances all around. John was even good enough to introduce me to Henry J.

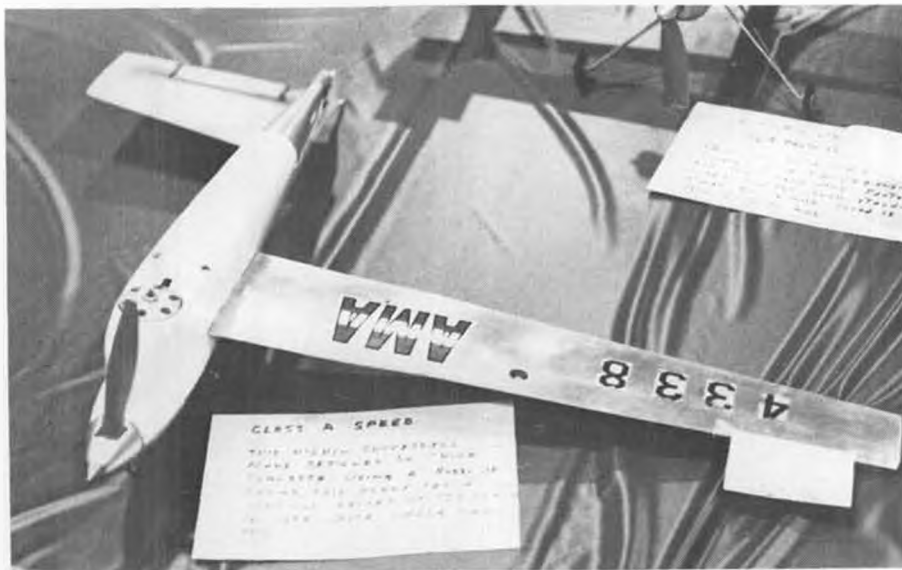
Nicholls, who is a complete trip all by himself.

At any rate, those who have been reading this column for a while will agree that John Worth and I just might not hit it off too well, right? But John was nice to me and didn't even ask about some of the things I've written about him!

On the way home, I got to thinking that maybe it wasn't quite fair for me to jump on the mistakes made by John Worth and/or the AMA without also spotlighting some of the positive things that are done.

Having resolved to write something good about John Worth and the AMA, I sat down to make up a list entitled, "In the Past Six Months this is What my AMA has done for Me". Right about now, you're expecting me to say that I couldn't find anything, aren't you? While it would be kinda fun to do just that, I'll resist the temptation.

Instead, I would like to compliment John Worth and the AMA organization for being very efficient as far as the dispersal of information is concerned. The results of the latest CIAM meeting being a good example. All of the FAI rules are hashed over at these CIAM meetings, and the results are quite important to those competing in FAI events. John Worth got the word out on the new FAI rules very quickly. So



Class A Speed plane by Chuck Schuette. Set new record of 172 in 1975. Single blade prop. (Date?) Note full pipe is nicely faired in. Very clean airplane. Dirty Dan photo.



The Slow Combat victor and his spoils. Mike Petri won 1st with a bit of difficulty. Rich Lopez photo.



Bart Klapiński and his profile stunt Javelin, a proposed House of Balsa kit. Half inch doublers, Testors 40. Dirty Dan photo.

quickly, in fact, that Dave Clarkson, C/L columnist for *Aeromodeller* (the English modeling mag), first learned of the new Team Race and FAI Combat rules via the AMA Competition Newsletter and the MACA newsletter. Think about that! The latest word got to Clarkson the long way 'round, coming from Paris with John Worth, being dispersed to the proper publications and then being mailed back across the Atlantic to England. You would think that the SMAE (the British equivalent to the AMA) could have notified British fliers as to rules changes a bit sooner than our own AMA, wouldn't you? Looks as if our AMA is doing a great job in keeping us up-to-date, and I certainly appreciate that.

#### NEW KITS

Seems as if I have a few kits laying around that deserve to be commented upon in this column.

First up is what has to be the most impressive C/L kit I've ever seen. Betcha think I'm talking about the M & P Stiletto, don't ya? Hardly. I'm talking about the three profile kits from G-S Products. I have a Skyraider kit, but there is also a Corsair and a Bearcat

available. All three kits are of profile construction and designed for .35's. Profile Carrier is a natural for all three kits, but they would also make very good Sport planes, either with or without throttle control.

So far, nothing exceptional, you say. Right on, but how about this? No die-cutting, all parts are machined to shape. Even the leading and trailing edges of things like the stab and elevator are already rounded for you. And the slots for the hinges are already cut for you! Gad! But there is more. A G-S 3-line bellcrank is included in the kit and the leadouts are attached. They are even staggered to match the G-S handle unit.

High quality wood throughout. Pre-bent push rods. A hardware package like you've never seen . . . *everything* is there. Plans and a super instruction book leave nothing to the imagination.

Hey, there's more, but you're just going to have to take a look through one of these kits for yourself. Every time I rummage through mine, I find another little goodie I hadn't noticed before. I'd been through the kit three times before I noticed the pre-cut hinge slots, for

instance.

Quality costs, of course, and the G-S kits aren't cheap at \$24.95. More than what you are used to paying for a profile kit, but worth every penny. The bellcrank alone is worth \$4.95. I would guess that the G-S kits give you more for the money than any other C/L kit currently available. Check 'em out and you'll soon see why hard-to-please Dirty Dan says these are outstanding kits.

Next is the new P-40 from Goldberg Models. Carl Goldberg himself showed me through this kit when I was in Anaheim, and then was nice enough to have a production kit shipped to me. Just to show you that "freebies" have no effect on me, I should probably be very critical of this kit . . . but I can't. It's a good kit that is well-designed all the way through. Carl is proud of this kit, as it features very complete plans, a couple of new construction techniques that are nice, and a good price. At \$13.95, you can't go wrong with this kit, if you're looking for a Sport plane in the .35 class.

In the next couple of weeks, I'll be building this kit for use in a N.W. Sport Race. If I come up with any criticisms,

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Cartoonist Don Shultz tests crankcase pressure in his OS 40 Stunt motor. Dirty Dan photo.



Max Snyder's trick Formula 40. Aluminum wing, half-pan, "V" stab, stainless gear, ball bearing wheel. Flies clockwise to eliminate torque problems on takeoff. Set record at '76 NW Regionals.



## C/L SCALE FAIRCHILD C-119G

By J. WARREN KOHLER, SR. . . . A victim of rules changes while it was being built, this model cannot now be entered in competition, but the construction techniques could be of value to many modelers.

• I have been building models for 38 years, centering my main interest in scale control line, with a preference for World War I aircraft.

With an interest such as this, it may seem strange that I chose to build an aircraft of a period from late World War II and beyond. My reasons are that the scale rules, when I started the project, favored a modern military, multi-engine plane. Rules that listed scale operations such as retract and extend landing gear and flaps, open and close bomb bay doors, drop bombs, etc., tend to eliminate simpler planes.

I started planning this model before the Air Force phased out operations at New York's Mitchell Air Force Base, well over 10 years ago. The 514th Troop Carrier Wing of the Air Force Reserve was based there, and started me with

spare copies of the Pilot's Flight Manual, an Illustrated Structural Repair Manual, an Illustrated Parts Manual, and an Illustrated Maintenance Manual. I received three-view drawings of the plane from the Fairchild Aircraft Corporation. I obtained photos from the Air Force and Fairchild. I also gained permission from the Air Force to take my own photos of the bird. In all, I have over 175 color and black-and-white photos of C-119 aircraft, ranging from models B through J. My model is painted to represent one of the last C-119G's operated by the 514th Troop Carrier Wing several years ago.

Construction is conventional, with the scale location and number of fuselage formers being used. The model is covered with 3/32 balsa, using both sheet and strip planking methods, depending

upon the degree of compound curvature at the particular location being covered. The surface is sanded down to approximately 1/16, and is then covered with .003 full hard aluminum sheets. These covering plates are sanded thoroughly with No. 220 wet-or-dry emery paper, used dry, on the underside to permit drawing layout lines and to allow contact cement to adhere. The rivet lines were made with a sewing or dressmakers tracing wheel. This process will do only for aircraft that use protruding rivets in their construction. The information as to the size, shape and location for the plating panels came from the plating diagrams in the Illustrated Structural Repair Manual, which also shows the location of formers, stringers, ribs and spars.

The rudders, elevators and ailerons



Most typical view of C-119. Complete interior work is described in text. Monorail delivery system is operational.



At last, a give-away! You can spot the engine cylinder head in this photo. Tires filled with silicon rubber to hold shape under weight.



From any angle, this model could easily pass for the full size aircraft. Total weight is over the current AMA rule limit, so model cannot be flown in competition. Rule changed during const.



Control leadouts can be seen in this photo, above storage tank in background. For maximum safety, pilot requires helper in center to overcome pull during flight.

are fabric-covered and painted with silver dope, as on the real aircraft.

Other external detailing includes all antenna systems, cabin heater exhausts, emergency exits, and life raft hatch. The life raft is made from polyurethane foam and is covered with yellow-dyed silk. When folded and left to "set" a bit it unfolds and looks like a real raft being inflated when the hatch is "popped".

All navigation, landing and passing lights operate. The beacon atop the left fin rotates.

The landing gear is fully sprung and completely detailed, including scissor, brake lines, electric switch housing, electric lines, and towing/tie-down ring. The gear folds and retracts in complete scale fashion. The wheels are Veco scale-type, and are filled with Dow

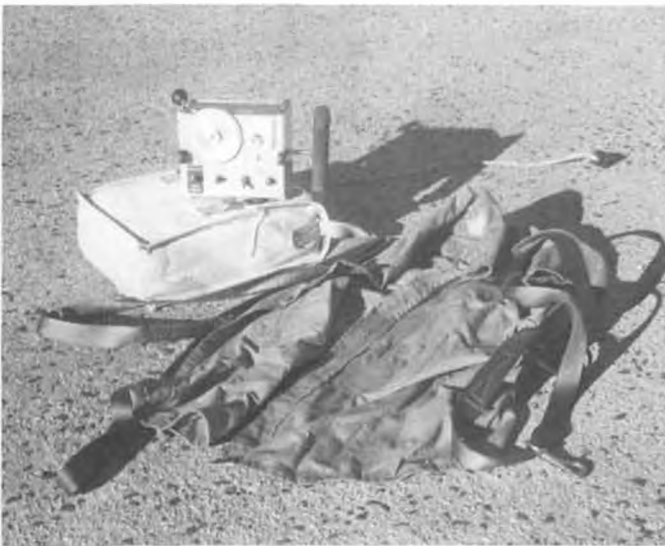
Corning Silastic B silicon rubber.

The interior of the model, both the cargo hold and flight deck, are completely detailed, including ceiling lights in the cargo hold and lamps over the radio operator's and navigator's stations.

The engines are K&B .29R series 61's, coupled into 2-cylinder alternate-firing inlines, as detailed in the March 1970 issue of American Aircraft Modeler. There are two twelve-ounce fuel tanks located in the wings between the fuselage and booms, and they are filled through the scale fuel caps located on the top surface of the wings. It is a pressure fuel system, obtaining pressure from taps on the engines. This quantity of fuel should give between ten and twelve minutes of running time.

The control system consists of dual bellcranks, each cut from 1/16 stainless steel sheet. The pivot bolt is 1/4 inch stainless steel. These bellcranks are mounted above and below a mounting-plate made up of a sandwich consisting of alternate layers of 1/16 plywood and 1/16 magnesium sheet, three wood and two magnesium layers altogether. The mounting-plate passes through the front and rear main spars just outboard of the left boom. The main spars, between the booms, and the main fuselage formers are one piece, and are also made from a plywood-magnesium-plywood sandwich. The plywood and magnesium are joined with epoxy. The lead-out wires are each insulated from the bellcranks and also serve as electrical feed wires. Each control line has an additional insulated wire wrapped around it. The control lines are .025 music wire and are insulated with a vinyl compound that also serves to glue on the extra wire. The connectors that are used between the control lines and lead-out wires are miniature roller chain connectors and are each rated at 160 pounds. The eight electric leads operate 9 electric motors, 2 solenoids, 1 buzzer, 4 pre-focused flashlight bulbs, and 4 grain-of-wheat

*Continued on page 77*



Ground control equipment, as described in text. Harness is for extra helper in center to anchor pilot during flight!



Foam stuffed life raft seems to inflate when it is released from compartment. Skin is actual aluminum plates over balsa sheet.



Super Stunt Fliers with Super Stunters (l to r): Alan Adamisin, Bob Gialdini, Dennis Adamisin, Lew McFarland, Keith Trostle, and Jim Silhavey. Twelve Nationals Stunt wins between them!



Ron Young's Cox .049 powered 1/2A ship, showing timer, plumbing, and DT.

# The 1/2-A SCENE

By LARRY RENGER

• This month we get down to work! Last month was introduction time and included a quick survey of the field of current interest among 1/2A modelers.

Whenever I go to a field where 1/2A is flown, there is always some comment made that my engines are hand-picked factory specials. To be honest, I rarely run hopped up, hand picked, or otherwise special engines. I do, however, break in my engines carefully, and make sure they have no problems. Problems most people have usually include: dirt in the fuel line, varnish in the cylinder, or air leaks somewhere in the engine or fuel system. In addition, I pay careful attention to fuel tank location and venting.

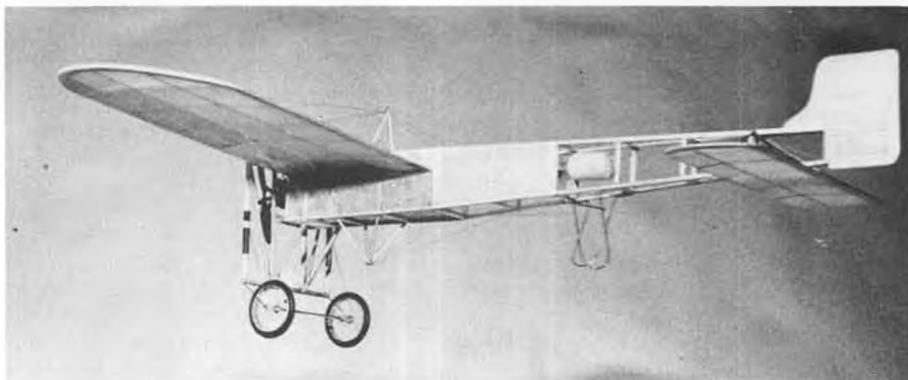
Engine re-work is a chancy thing at best. Results of hop-up are usually small and sometimes end up with a net loss in rpm. Most people who hop up engines evaluate results by ear, a remarkably sketchy measuring device. We will get into hop-up techniques as time goes

by, but only ones I can duplicate and verify with a tachometer on standard fuel and prop.

The place to start for top performance is with basic engine operation. In general, an .049 can not swing a prop larger than the Cox 6 x 3 and reach peak power. The Cox 5-1/2 x 4 has to be

cut to 5 inch diameter even for use on the Tee Dee engine. Excess prop load leads to varnish formation, and erratic running. Next, nitromethane content of fuel should be at least 15%. Finally, break in your engine carefully and it will deliver full power, run smoother, and last longer. Engine break-in serves one

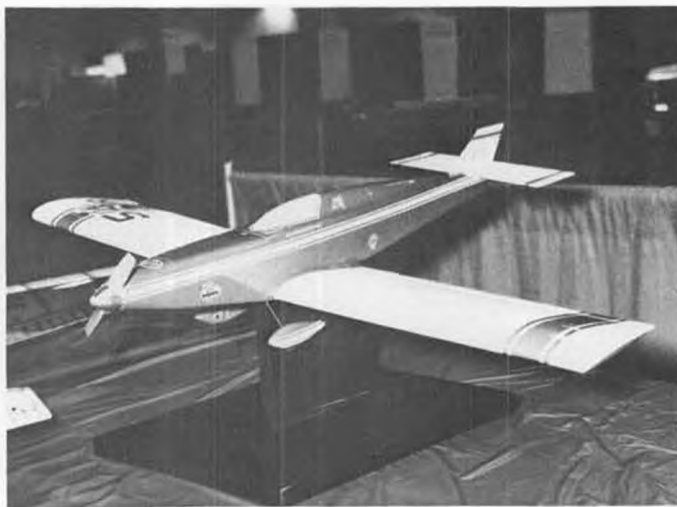
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Bleriot XI built from R/N Models kit. Prop is out of scale, but .010 is all that's needed to power this little scale model.



All-sheet balsa model from Competition Models. Two-channel radio on rudder and Medallion .049 throttle. A fun sport aircraft.



Half-A "Streaker" from Allied Hobbies kit, on display at the MAC Show R/C Pylon display. Upper deck is vacuum molded.



## the **AERO 101**

By **WALT MOONEY** . . . Yes, occasionally our "Peanut Bender" runs across some wood that's too big for the 12 plus 1 models, and when he does, we all benefit from his ways of using it to build bigger scale models.

• The Aero 101 was designed by Messieurs Chapeau and Blanchet as a light tandem two-seat sporting biplane for the "Service de L'Aviation Legere et Sportive." It first flew in 1953. It is powered by a 75 hp. Minie 4 DC-32 flat four engine, and is of all wood construction.

For many years it has been on my list of "Biplanes I'd like to model if only I could find a 3-view." Not too long ago, a friend of mine in France was kind enough to get me the information needed. Then the "Flightmasters" decided that biplane Jumbo scale could have as little as 30 inch wing span. Voila! Le inspiration!

The high aspect ratio wings and the simple strut arrangement make the model an ideal Jumbo scale, and keep the overall airplane from being too large to carry all assembled. Hence, this design has all the components permanently attached. As a biplane, it's more complicated than a simple monoplane, but it's still a rather simple, easily-built design.

Structure follows standard procedure for scale models. There are only a few places where a builder might have construction questions, so the basic structure of the various components will be described and basic assembly procedures ignored. However, the struts and wire bracing were done with a technique that is not so common, and that will be covered more thoroughly.

The fuselage is standard; two sides built over the plan, with longerons and uprights. These are removed from the

plan, cemented together at the tailpost, and assembled into a rectangular box with cross braces. Then the formers are added on the upper side, followed by stringers and cowl planking. For rubber motor clearance, cut the upper cross braces away from the area of former relief openings just prior to covering.

The tail, both vertical and horizontal, is standard structure. Note that it is a quarter of an inch thick. The leading and trailing edges must be blocked up above the plan as they are being assembled. The airfoil shapes are sanded into the structures after they are dry and removed from the plan.

The top and bottom wings are built up over the same plan and are identical except for the location of the root ribs and the strut support filler sheet, which is above the main spar on the bottom wing, and below the spar on the top wings. Tilt the root ribs outboard during assembly to provide the correct dihedral. Also, before assembly of the bottom wing to the fuselage, the root rib should be fitted to the slight curvature of the fuselage in plan view. Note also that there is a crosspiece in the fuselage to carry through the wing loads. These are "L, M and N", and a piece of eighth by quarter crosspiece between the longerons at the wing trailing edge.

The windshield frames were laminated from model railroad basswood strips. Wire frames would also be suitable.

In accordance with my most recent approach to the landing gear, the main landing gear wire is bent to lie just outside the actual scale landing gear leg. It

is attached to the leg, but is free to deflect under impact loads and therefore absorb rather than transmit them into the scale landing gear structure.

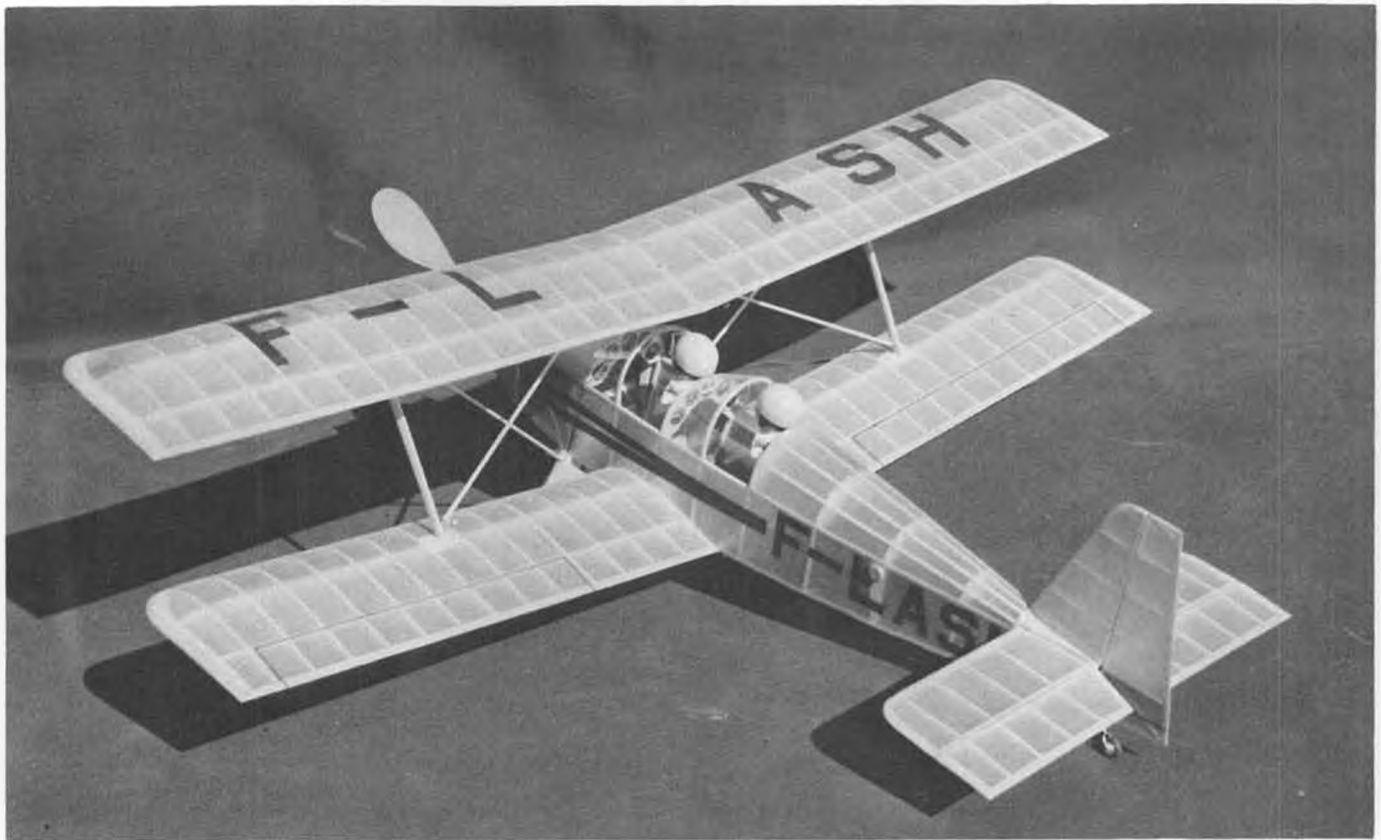
Now assuming your model is ready to rig, let's consider the struts and flying wires. Feel free to use your own preferred system if you don't like mine.

First, music wire is used for all the struts. On the model shown, these wires are surrounded by plastic tubes which simulate the actual sizes. These plastic tubes were obtained from plastic window drapes. The tubes that surround the flight wires are about an eighth of an inch in diameter, and round in cross section. The tubes that surround the interplane strut wires are oval in cross-section and match the size shown. My supply of this tubing was obtained by buying some second-hand plastic roll-up drapes at a local handicapped veterans store. These came in a lot of colors, and you get an awful lot of strut material for your money.

Carefully bend the cabane strut out of two pieces of wire. The most forward strut is one piece. The other four struts are bent up from the other piece. There is a washer soldered at the two top points of the cabane. The top wing is impaled on the points extending above the washers. The center strut is bound to a 3/16 x 3/8 brace under the sheet cowl, forward of the windshield. The bottom of the other legs are bound with thread to the two top longerons. This last sentence proves you better read the instructions before you build the model, because the cabane has to be attached to







The Aero 101 is a pretty biplane from any angle, though we may be a little prejudiced! High aspect ratio wings and minimum strut rigging make it an ideal Jumbo scale project, and minimum span for biplanes is now down to 30 inches.



Mooney builds scale models to fly, and the Aero 101 is no exception.

the fuselage before it is covered with balsa sheet and tissue.

The other struts and wires are bent up to length with hooks at each end to hang on to the fittings. Fittings, as referred to here, are as listed below. For the interplane struts, the fittings are the wire staple shapes that penetrate the strut support filler on the wings, and are cemented to the main spars. In the case of the flying wires, the fittings they hook to are the exposed top corner of the main landing gear wire, the section

of the front cabane strut just forward of the washer, and a small loop bent in each end of the interplane strut wire, which also acts as the hook in the wire fitting. The plastic covering for the wires has to be installed before both hooked ends are formed. Since all the struts have to be tight without deforming the balsa structure, it's best to assemble the lower wings to the fuselage first. Then attach the top wing to the cabane. Then make the interplane struts and hook them in place. Finally, make the flying wires to fit exactly with the wings blocked up to the correct dihedral. This may take you more than one try, it did for me, so have a couple of lengths of wire to spare. Don't try to force an over-tight wire in place, or use a loose, sloppy one.

The front windshield is penetrated by the aft cabane struts. Make a paper pattern and determine where the holes for the wire must be and the slits extending forward from the holes that are necessary to install the windshield.

Jumbo scale requires a pilot. The model shown has two, they are particularly gutless individuals, because they have to clear the rubber motor. Carve them from balsa, or styrofoam, or buy them from the model shop.

The model will fly on six strands of 3/16 rubber, but does better with eight. Nevertheless, I suggest starting with the smaller motor and working up to determine your particular thrust line adjustment requirements. The model in the photo required about an eighth of an



This, and photo at left were taken at Mile Square, Fountain Valley, Ca. during contest.

inch of downthrust.

An eighth of an inch of washout is recommended at each wing tip.

Note also the center-of-gravity location. Ballast your model, if required, to obtain a balance at this point. The model should assume a level attitude when supported at the rear spar of the top wing.

Join the editor of MODEL BUILDER, who thinks biplanes are the best and have fun with a Jumbo Aero 101. Au Revoir.



This photo of Fernando's 12 inch-to-the-foot scale Challenger was taken in February by Jack McCracken. If any of you have been waiting for a letter from our F/F Scale editor, this may help to explain the delay!

## FREE FLIGHT SCALE

By FERNANDO RAMOS

• This month I am loaded with much miscellaneous ramblings about our favorite subject, scale! First though, I want to bring you up to date on my full-size biplane project.

Like most good intentions and best laid plans . . . there always seems to be something that continually confronts ones endeavors. If anything can go wrong it will! This is the well known Murphy's Law. Murphy has made it rough for a couple of months, but I shall overcome. I'm presently into the sheet metal work on the fuselage, and I have found this to be the most difficult task so far. However, I have it just about completed. I find this project is very similar to

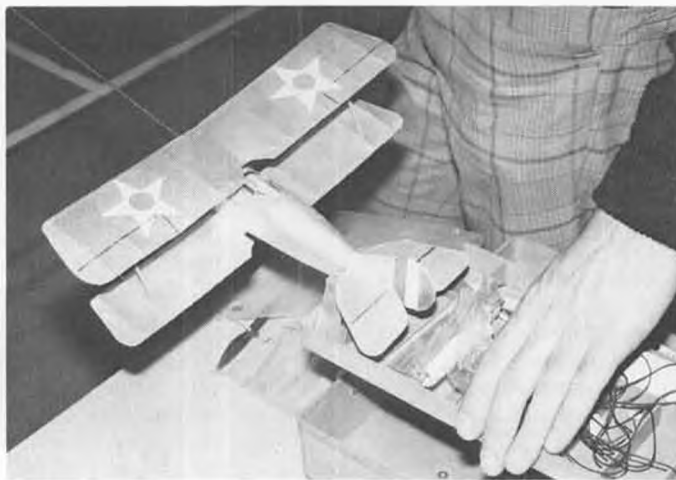
building a scale model. I've yet to build a scale model from beginning to completion without running into several stumbling blocks. The same is true with the big one as well.

After the aluminum work comes the installation of all the instruments and their related plumbing and electrical hook-ups. I've been told that the instruments should go in last, otherwise there tends to be this urge to climb into the cockpit and fantacize a bit. Can you imagine a grown-up man doing something like that? You bet!

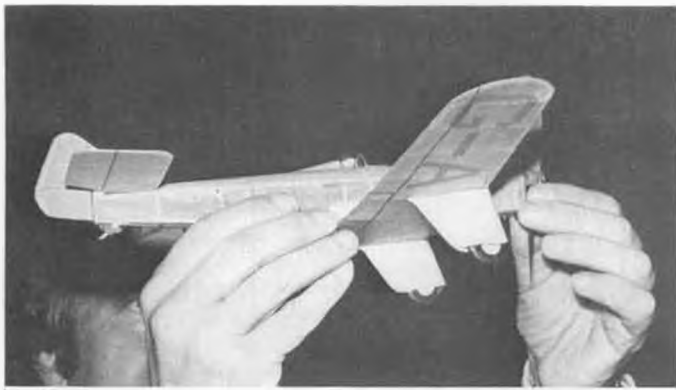
I anticipate that I will be able to start covering during the month of August, with painting to follow. Hopefully, I will

be able to take care of the multitude of detail work so that test flying can be done around Thanksgiving time. My test pilot for this major event will be none other than the Old Professor, Walt Mooney. No one can ask for anyone better or more qualified. I'll keep you posted.

While on the subject of full-size airplanes, I took a drive to a little airport down our way, called Flabob. To most local homebuilders and scale modelers, this is a well known spot located a few miles north of the city of Riverside. On this little airstrip you will find, nestled in hangars, many restored antiques and others in various stages of



All of the Peanut Scale photos on these two pages were taken by Mike "Beach's Flyer" Beach, of Middlesex, England. Scene was the Catford Sport Centre, a suburb of London, in June 1976. At left, Austin Newman's Turbulant, and at right, Wally Caldwell's Thomas Morse scout.



Vic Duberry's Miles Sparrowhawk. Incidentally, the Beach's Flyer previously mentioned, was published in Jan. '75 MB.



Westland Widgeon, by Allan Callaghan. Mike Beach was a visitor at the 1976 Nats. It was nice meeting him during the old timer flying.

restoration. Here are just a few examples: Monocoupe 90-A, Bellanca Junior, Buhl Airedan, Stinson Junior, Waco RNS, Funk, an early Staggerwing Beech, Fairchild 22, Fleet, Aero Sport, an Inland Sport, and of all things, a Gee Bee Model Z racer. This last one is really something to see!

There are also a lot of homebuilts at Flabob, and I spend a lot of time out there because the designer of the Charger biplane that I'm building has his hangar located there, and it is always jam packed with more nostalgia than one can imagine.

If you want to be successful in flying scale, I think that exposure to the full-size oldies is really helpful. Obviously, the wealth of detail you can capture from these rare birds, as well as learning how things are attached, such as cowlings, wing struts, flying wires, etc., can certainly make your next project more accurately detailed. I realize that airports such as Flabob don't exist near every town, but you can

contact your local EAA chapter for a schedule of fly-ins near your area. These fly-ins attract many of the great old antiques, and warbirds as well. Here in California, we have several big fly-ins, and it is certainly worth the long drive to get to them in order to photograph some of the greatest airplanes ever built.

For years, a friend of mine, Joe Morgan, has been busily restoring one of only about four Inland Sport antiques in existence. This little parasol is powered by a 90 hp, five cylinder radial Warner engine. It seems as though I was there at the right moment, because Joe was preparing to start the engine for the first time since it had been carefully rebuilt. While sitting in the cockpit, waiting for another fellow to prop his engine, Joe invited my three year old son to sit beside him. I want to tell you, I couldn't be sure who was wearing the bigger smile! The anticipation of flying this machine after many years of hard work was truly recorded on Joe's face. As for my son, it was his first time in an open cockpit airplane. Little models

or big ones, we all go through the same slings and arrows. It is simply great!

\* \* \*

The first modeling hint that I want to pass along involves the use of Windex. I always keep a squirt bottle of this commonly-known window cleaner on my workbench. Whenever I have to bend some balsa sheeting for cowlings, etc., I just squirt some Windex on the side which will be on the outside of the bend. In a few seconds, you can really curve the sheeting around nicely. Windex contains ammonia, and as most of you know, that is the ingredient which really makes balsa bendable. I don't know what percent ammonia there is, it can't be much, but it does the job. This saves time, since you don't have to bother with household ammonia or ammonium hydroxide. I imagine that other window washers would work as well, since they all generally contain ammonia.

Wilhold has recently come out with a new glue, called R/C-56. It is strong, tacky, dries clear, and is flexible. It is

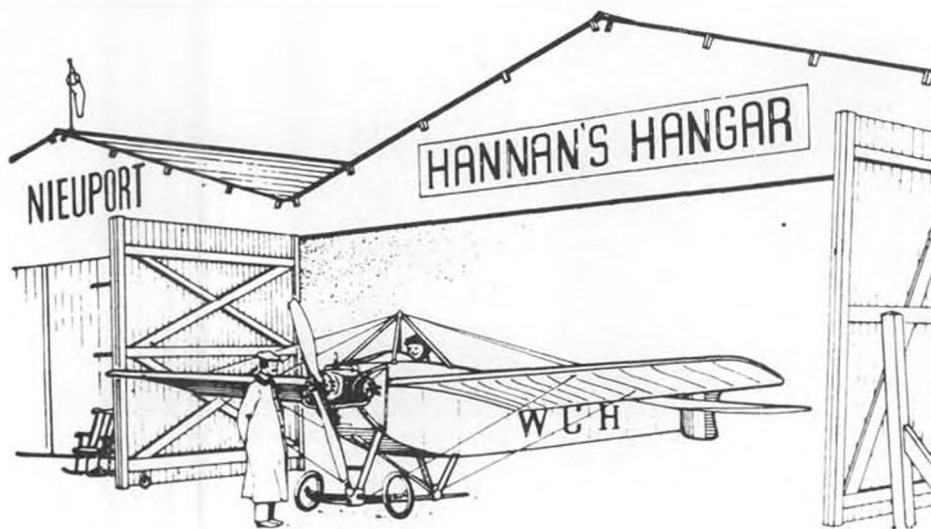
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A beautiful little Gipsy Moth-like biplane, an Avro Avian, built by Keith Miller. Note profusion of false ribs.



David Deadman offers perfect no-shove release of his Udet Flamingo. By coincidence, this is our next month's Mooney Peanut.



**"Nothing is ever as simple as it may first appear."**

• Our lead-in line this month by courtesy of Flightmaster Jack McCracken, and it certainly applies to this hobby! PEANUT PROXY POSTLUDE

Doubtless the contest has been covered in greater detail elsewhere, but a few comments may be pertinent: Response was again good this year, and the variety outstanding. Chuck Conover obtained the use of the fine Cal State Long Beach College gym, and the cooperation of the officials, headed by Bill Bovee, was much appreciated.

Carl Hatrak shouldered the contest directorship, while Russ Barrera served as chief static scale judge, as well as assisting Carl during the flying portion of the proceedings. A cheerful, hard-

working crew of volunteers spent two days static judging and proxy flying the many models, and in general, things went more smoothly than last year. The sheer magnitude of the task borders on overwhelming, and yet it is indeed rewarding to have the chance to participate. My guess is that the entire crew will be "ready to go" again next year.

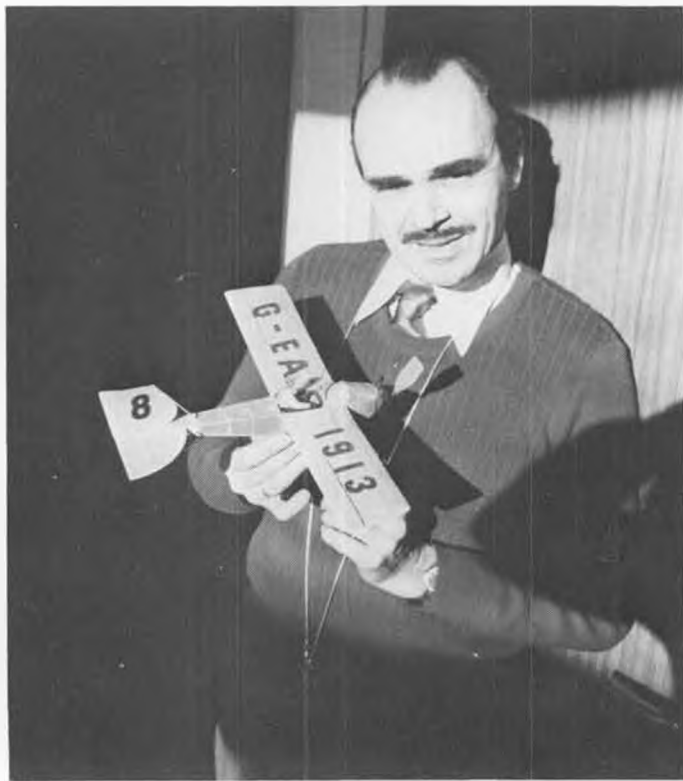
Every Peanut had something to offer by way of an education in building, to those willing to look closely. The techniques displayed made it obvious that we all have much to learn, regardless of our previous years of experience. This became particularly evident when comparing several models based upon the same kit or plan design. One was forced

to realize, in many cases, that models are not necessarily better or worse than others . . . merely different! The latitude for individual interpretation is very wide indeed, and in my opinion, is a large part of what scale modeling is all about. One might tend to assume that a Peanut Piper Cub is a Peanut Piper Cub . . . but not so! Diligent examination discloses differences which would likely escape the casual onlooker. Some models are so "quiet" (unobtrusive) in appearance that they might be overlooked entirely. These "Q-ships" upon close scrutiny, often reveal meticulous detail and craftsmanship, worth of special study. By contrast, some models are quite straightforward, with a minimum of intricacies, yet so skillfully finished that they fairly shout to be recognized. Clearly, the gamesmanship aspects of flying scale modeling deserves more investigation.

Regarding details; dummy engines for example, entries covered the entire spectrum from missing completely (my engine is missing!) to superdetailed. Some featured generalized powerplants, relying heavily upon paint for effect; others used traditional thread-wrapped-around-a-dowel approaches; while still others were intricate enough to garner high points in an R/C scale model contest. To carry the investigation further, to more minute components, such as exhaust systems, one could find basic balsa carvings, plastic or aluminum tubing skillfully formed, and other fabrications which were evidently actual full-size items, magically shrunk to Peanut size! If there is a frustrating aspect of the proxy competition, it must certainly be the difficulty in finding out "how it



Oh ecstasy! Look at that lovely Gipsy Moth. The Peanut is by Peck-Polymers, while the big one belongs to Hank Wheeler, San Diego.



Howard Hughes built models!! Sorry folks, it's really Benno Sabel, of Germany. Eastbourne 1913 built from Ray Malmstrom plans.



"So what! At least it won't keep blowing away every time a little breeze comes along!" Bob Haight treats 'em rough.



Larry Williams won the R/C Class at Flightmaster's R.O.W. contest with this sweet looking Supermarine S-4, Lake Elsinore.

was done", in the absence of the builder.

Model covering ran the gamut of condenser paper, Japanese tissue, domestic tissue, bond paper, and sheet balsa. Roger Aime's entry from France, a tiny Nieuport Racer, appeared to have been planked, resulting in a tremendously strong fuselage structure. This was most fortunate, as it was able to withstand considerable mistreatment in the hands of the postal service, enroute. A repair crew had this, and several other damaged models, back in flying shape in short order. Sadly, a few models were damaged beyond repair.

Colors and markings were executed by every know means, such as colored itssue, dyed tissue, brush painting, and air brushing. Obviously, some of the entrants have made an art out of finishing their models.

Weights too differed widely, from "almost nothing" to "it will never get off the ground". And yet, some seemingly heavy models turned in surprisingly good durations, proving that there are ways of achieving flight efficiency and realism.

The proof-of-scale folders were especially creative this year, with welcome (to the judges at least!) applications of good humor. After several solid hours of static evaluation, a chuckle can certainly lift one's spirits.

The foreign entries are always a treat to see, and represent a considerable amount of extra trouble and expense to their builders. The international flavor added by their presence greatly contributes to the satisfaction of participation . . . sort of a "mini-Olympics."

To those of you who entered, our

thanks . . . and to those of you who didn't, how 'bout next year?

#### AND ON THE SUBJECT OF PEANUTS

Bob Meuser, Editor of the National Free Flight Society Digest, and magazine columnist, offers some though-provoking comments regarding the current AMA rules:

"To me, flying Scale models for *duration* is dumb anyhow, fundamentally. Judging of both fidelity and flight should be done strictly with an applause meter.

"But if people must fly for duration, then the rules should be crystal clear at least, and should promote the sort of models that most modelers in the field like to build. Those features that most modelers consider important should be rewarded in proper proportion. Few Peanut types like, or build, ultra-light models; only indoor-nuts-turned-Pea-

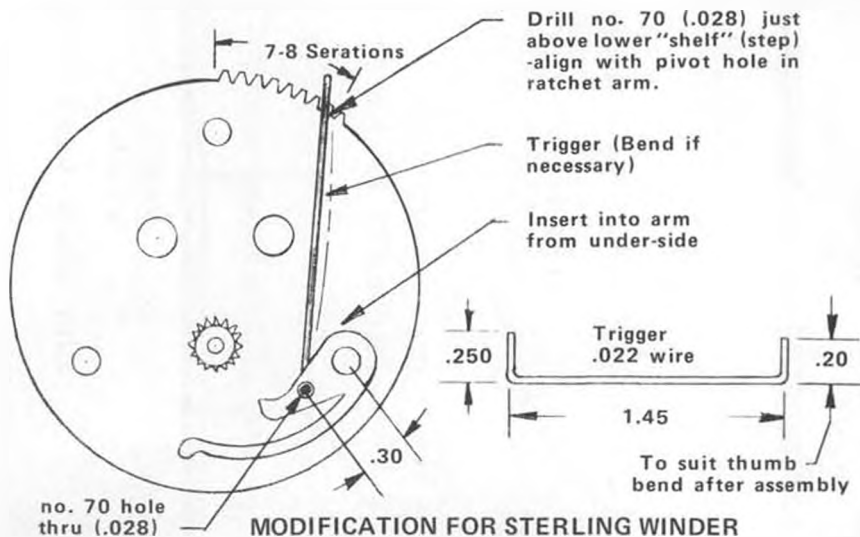


Caproni CA-5 spans 17 inches. Built from US Model Aircraft Corp. old time plans, by Vern McIntosh, Portage, Mich. Plans from Pond.

nuteers build them. So, somehow, the extreme duration of which they are capable should not be rewarded.

"Simply juggling the ratio of scale to flying points will not hack it. But putting cut-offs on *both* scale points and flying points would. If not a cut-off,

*Continued on page 73*



# FRED

By BILL WARNER . . . Here's a little hand launch glider for the little modelers in our hobby. It'll keep them busy retrieving while they're learning some of the basics.



Michele Warner, 9, demonstrates proper position of finger on wing ("Flip-grip" glued to underside at that point).

FRED: a Happy, Hearty Hand-Launch for Hot Little Hands

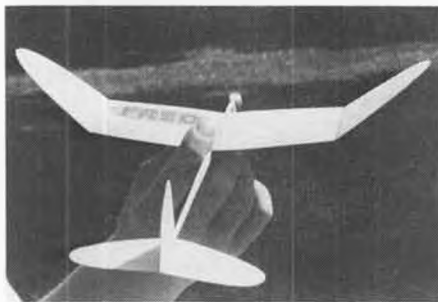
A youngster who cannot throw high,  
No matter how hard he may try,  
Has little to dread  
Chuckling up little Fred  
To its parking spot up in the sky.

For strength, the tail boom is of spruce  
(A very fine wood for this use).  
Balsa for the rest:  
"C" grain is the best,  
The lighter, the better, by Zeus!

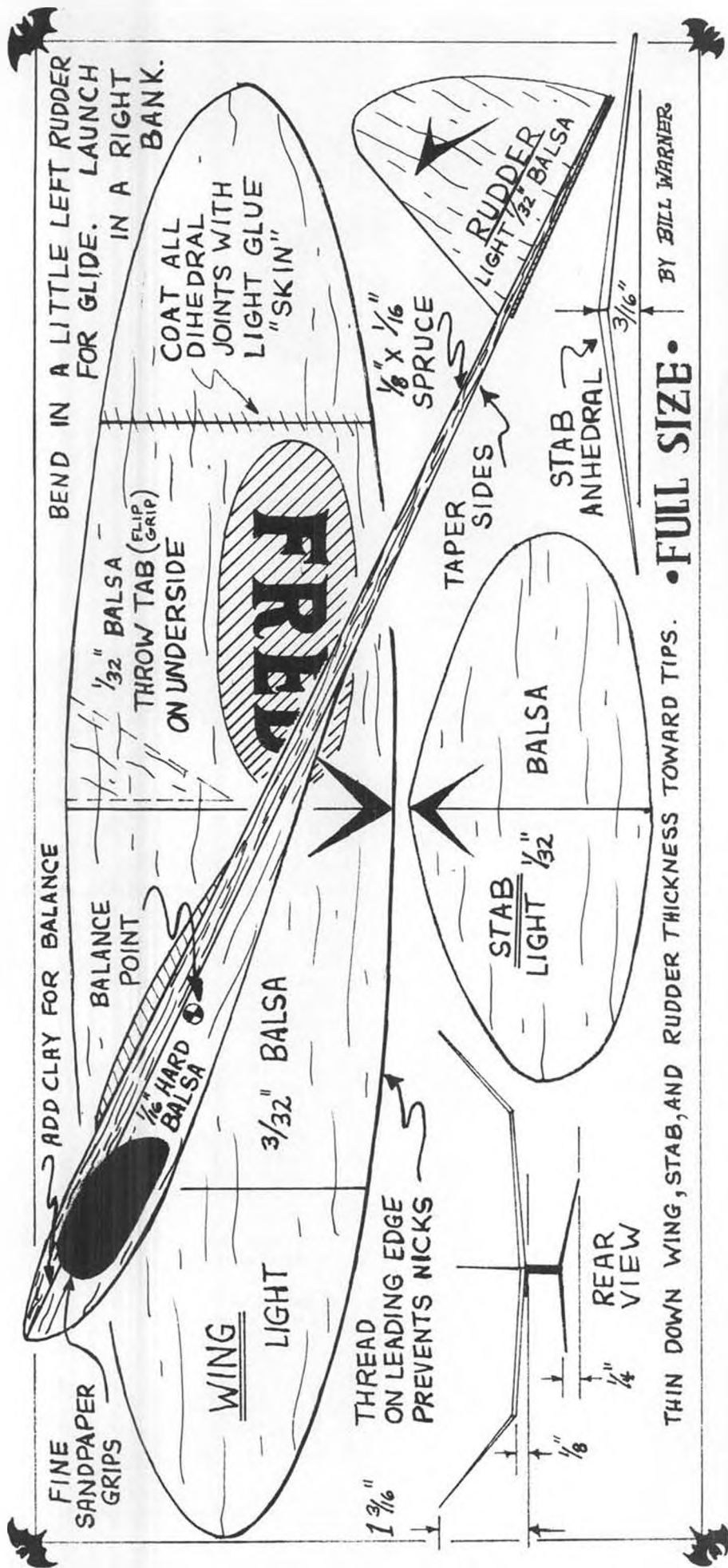
For flying this trim little ship  
Forget not to put on a flip grip.  
Without this little thing  
Glued on under your wing  
Your wing from your fuse you will rip.

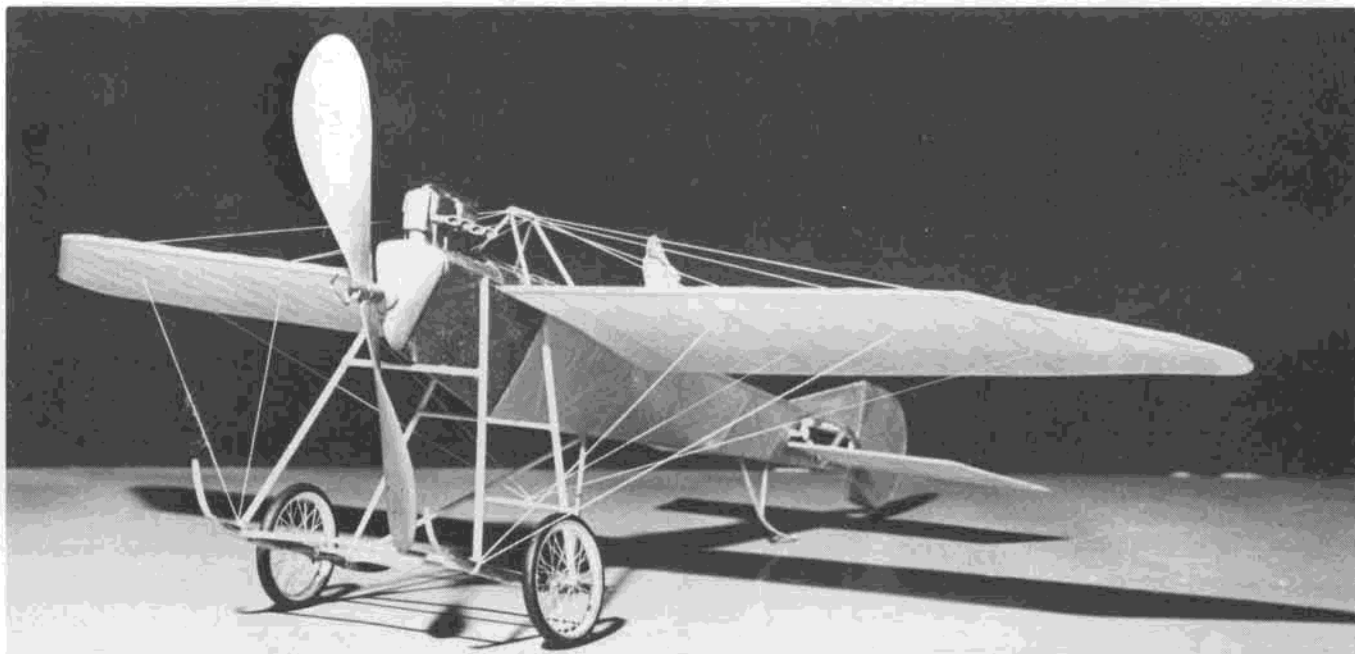
So pick a calm, sunshiny day,  
But before you get carried away.  
Try an easy test flight  
And get the trim right,  
You won't break up your glider that way.

Get a smooth, shallow, left-circling glide  
'Till a thermal you're sure it will ride.  
When chucked hard to the right,  
Spirals up out of sight  
While you watch it soar upward with pride.



At 2/10 ounce, "Fred" is easy for kids to get altitude and long, stable flights.





## Peanut THE MONOPLANE "HIRONDELLE" \* 1911

By JEAN-FRANCIS FRUGOLI . . . In France, a Peanut is a "Cacahuete", which doesn't change the way it's built or the way it flies, but it sure would louse up the title of our Parcel Post Proxy . . . Somethingrother!

• This little ship won the Best Workmanship (Foreign) Trophy for the author/designer in the 1976 Model Builder Proxy Peanut Contest. Jean-Francis sent us his excellent inked drawing so we could publish the plans. Unfortunately the drawing is a little too big to fit Model Builder's pages. Rather than reduce the whole plan photographically by 5%, we have taken the liberty of cutting and relocating certain portions of the drawing. It's a tight squeeze, but it's full size!

Incidentally, Jean-Francis also wrote the article, in English, to go with the drawing, and apologized for his linguistic errors. Proof readers should have it so easy! We have taken the liberty of leaving the article pretty much as is, in order to retain the flavor. wcn

The old aeronautic publications are treasures for the "cacahuetes" builder. Examining a collection of papers published in the journal "L'Aero" (1911-1912), I discovered among other "Belle Epoque" models this aeroplane with racy and elegant lines, designed by Henri Lemaître et Gaston Legrand. Its name: "L'Hirondelle".

Good areas, good ratios, dihedral, this is, for the French modelers, beginners in Peanut contest, the ideal "cahier des charges" to select a cacahuete model.

My first model was tested outdoors (poor, poor modelers of Marseille who have not your fabulous gymnasiums!) and the flight, after dihedral adjustment, appeared stretched and swift. Really a swallow. My second model was built to enter the famous Model Builder's PPPP.

I offer you its description.

### CONSTRUCTION

Building begins with the construction of the two half-wings and stabilizer. So, this elements can dry pinned on the work board while you build the fuselage.

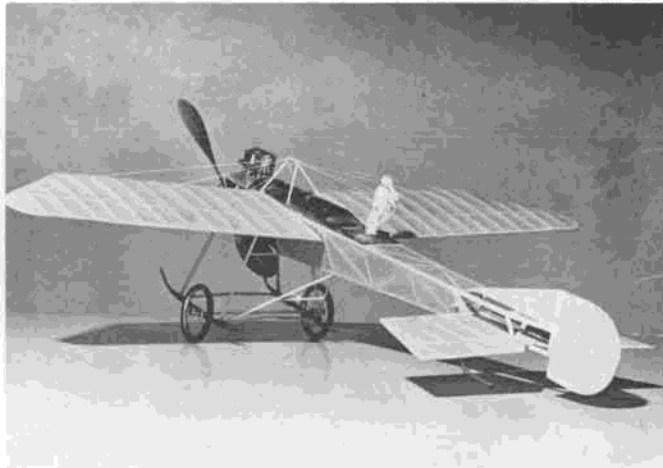
The ribs are 1/32 light balsa, sliced with the help of two shapes. The three tip ribs are only shortened at their leading edge. The wing tips are made with laminated strips glued together but can also be made with formed rattan. The spars (3/64 medium) extend 1/8 inch farther the root rib, and then position the wings when they are fixed.

The first one rests on the spar of the fuselage, the second one under (a small square hole is cut in the covering of the fuselage). So, the incidence angle will be obtained.

*Continued on page 82*

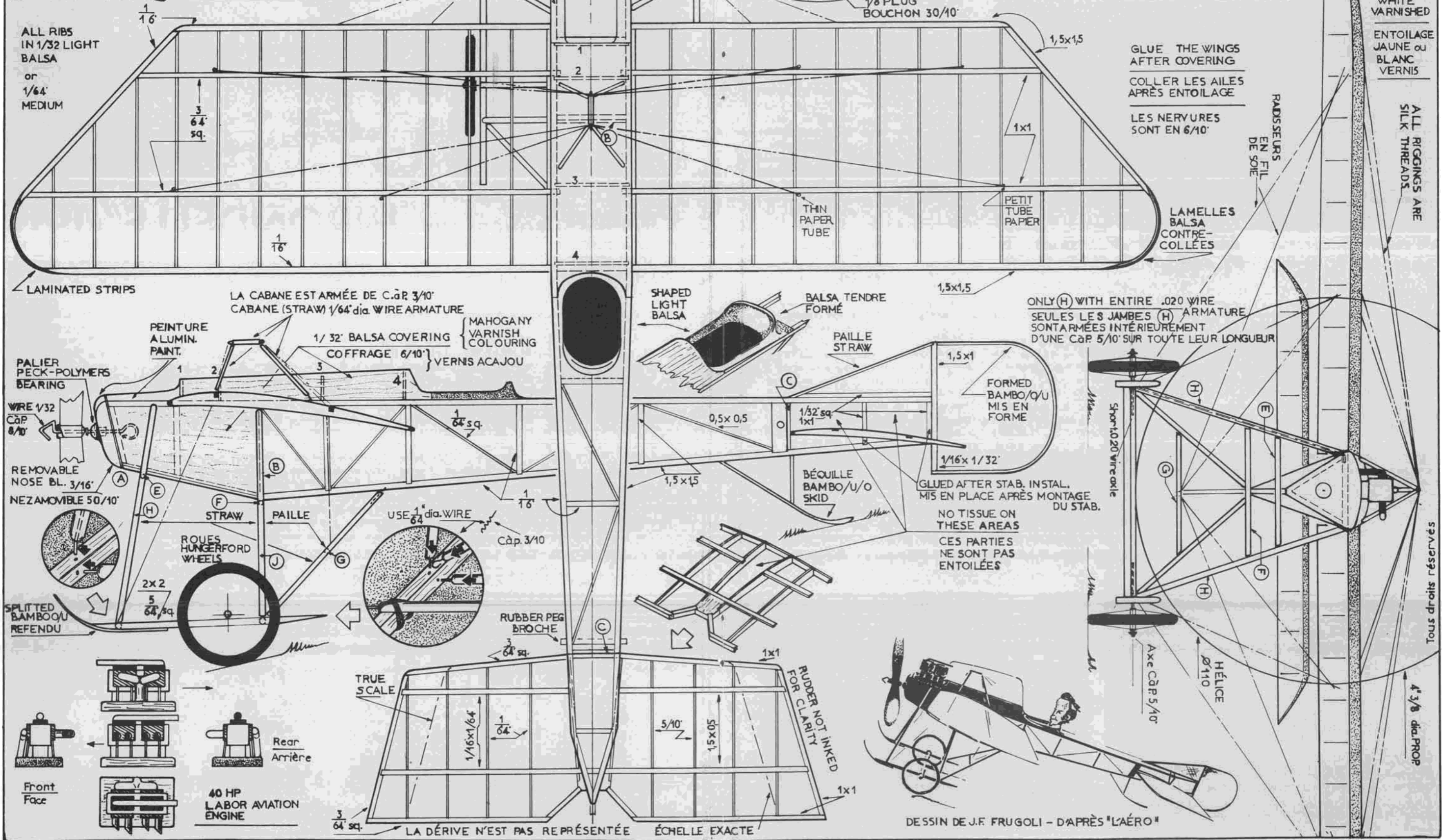


Close-up photo by Jean-Francis shows landing gear detail and construction of scale engine. Wheels are Hungerford, naturally.



The model has been donated to Model Builder's Peanut Museum, except for the wheels, which were returned to Jean-Francis.

"CAGE A POULES" Serial  
**hirondelle**  
 Cacahuète \* 1911  
 \* de Jean-Francis FRUGOLI



ALL RIBS IN 1/32 LIGHT Balsa or 1/64 MEDIUM

GLUE THE WINGS AFTER COVERING COLLER LES AILES APRES ENTOILAGE

LES NERVURES SONT EN 6/10'

COVERING ENTIRELY YELLOW TISSUE or WHITE VARNISHED

ENTOILAGE JAUNE or BLANC VERNIS

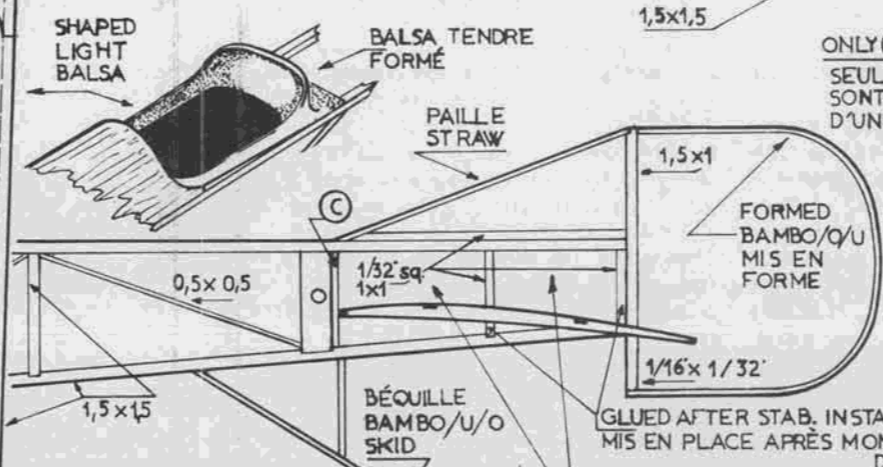
ALL RIGGINGS ARE SILK THREADS

LAMINATED STRIPS

LA CABANE EST ARMÉE DE C.ØR 3/10' CABANE (STRAW) 1/64' dia. WIRE ARMATURE

MAHOGANY VARNISH COLOURING VERNIS ACAJOU

1/32' Balsa COVERING COFFRAGE 6/10'



ONLY (H) WITH ENTIRE .020 WIRE SEULES LES JAMBES (H) ARMATURE SONT ARMÉES INTÉRIEUREMENT D'UNE CØP 5/10' SUR TOUTE LEUR LONGUEUR

GLUED AFTER STAB. INSTAL. MIS EN PLACE APRES MONTAGE DU STAB.

NO TISSUE ON THESE AREAS CES PARTIES NE SONT PAS ENTOILÉES

PALIER PECK-POLYMERS BEARING

WIRE 1/32 CØP 8/10'

REMOVABLE NOSE BL. 3/16' NEZ AMOVIBLE 50/10'

ROUES HUNGERFORD WHEELS

SPLITTED BAMBOO REFENDU

USE 1/64 dia. WIRE CØP 3/10'

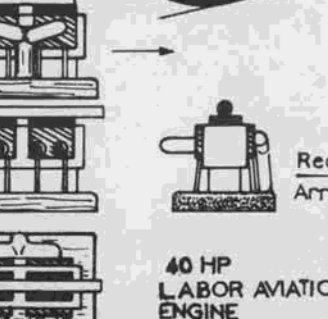
RUBBER PEG BROCHE

TRUE SCALE

3/64 sq.

1/16 x 1/64

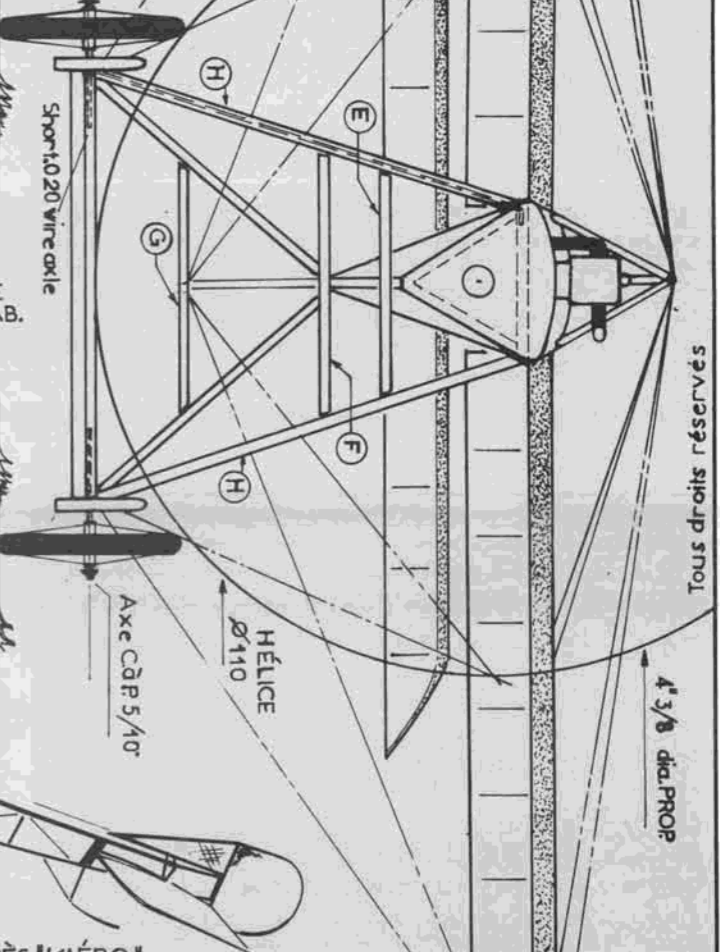
1/64



40 HP LABOR AVIATION ENGINE

Front Face

Rear Arrière



Tous droits réservés





Remember this gentleman? He's still flying in the Northwest. Won ABC Gas at the recent Northwest's Annual with this Geef 630, built way back when . . . Dan Sobala.

# FREE FLIGHT

By BOB STALICK

• This has really started out to be an exciting summer. As I write this, it is still early July, and I am looking forward to attending the Boeing Scholarship Contest as a proud father, attending the Dayton Nationals as a proud reporter for MODEL BUILDER, figuring out whether I can make it to the Blaine FAI Finals as a proud watcher, and thinking of at least a half-dozen other reasons why it makes me happy to be a free flihter.

One of the better reasons is that I have finally gotten some new ships built and tested for the FAI events. Power and Nordic. With all of the adverse publicity in other magazines about my own attitude to FAI events, it gives me a real kick to be able to say to the detractors, "I'm still here."

So is the September column . . . SEPTEMBER MYSTERY MODEL

Try as I might, I have not been able to stump too many of you older types lately. After going through all of my old magazines, I have come up with several which should keep everyone guessing for the next three or four months. To kick things off, try this one for size. Powered by the "new" Cox Pee Wee engine, this little sport free flight was presented as, "Looking for something different? Try this out-of-the-ordinary airbuggy. The . . . design was motivated by two things: 1. Previous successes with delta free-flights, and, 2. A long standing admiration for the negative stagger-wing Beechcraft . . ."

Now if you know what it is . . . and I bet you don't . . . be the first in your

time zone to send the name to Bill Northrop (use M.B.'s new address). Good young (*Thanx. wcn*) Bill will see to it that you are properly rewarded.

On the subject of Mystery Models, Sears McCarrison dropped me a letter as a result of the June Mystery Model "The Jasco (Frank Zaic's) Floater." He says, "It is the best model for old timer tow-line events. George Moreland won the event at our May 2nd meet with a Floater. Another flyer lost his Floater O.O.S. on his first test flight with a brand new model."

"The Floater type of rudder lends itself quite well to the pop-up stab d.t. The fin is so huge that there is plenty of room for a cut-out to allow the stab to pop. George Moreland's ship had just such a dethermalizer. Stan Colson had the same type of d.t. on his Thermic 72, which has the same rudder as the Floater. The enclosed sketch gives an idea as to how it was done." All well and good, sez I. Neat guy this McCarrison fellow. Then he adds a PS to his letter, it reads, "I intend, however, to make my Floater for radio control."

Sears, I don't hold that against you--anyone who reads Model Builder Free Flight has to be O.K. (*As long as he reads MB he can put a DT on his Deep-V! wcn*).

DARNED GOOD AIRFOIL: Go. 602

The Go. 602 is from the Goettingen laboratories, specifically designed for FAI Power. It is a compromise airfoil between power and glide, not unlike the Benedek B 8353 b2. It would make a suitable section for any model where there was a high power-to-weight ratio. Thinned out to about 8.5%, it would be very useful on today's high-powered FAI power models. As is, Klaus Hertsch recommends it for Wakefield. Use an 8% or less Clark Y section for the stabilizer.

THREE-VIEW FOR SEPTEMBER . . . Blackbird A/2

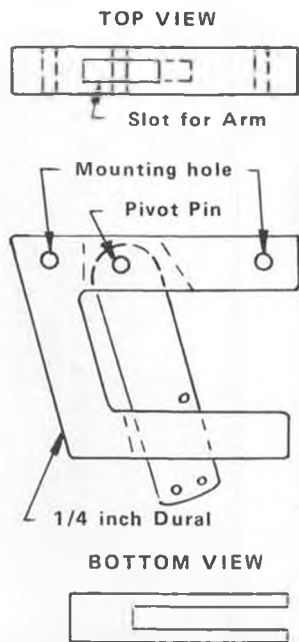
The next step for Jim Walters' Bird is this latest development "The Blackbird." The model is basically similar to



F/F Editor, Bob Stalick hides behind the wing of his "Midnight Special" FAI Power model. Who said he quit power?



Ted Stalick launches his Coupe d'Ville, built from Blue Ridge Models kit. Flew great from first flight.



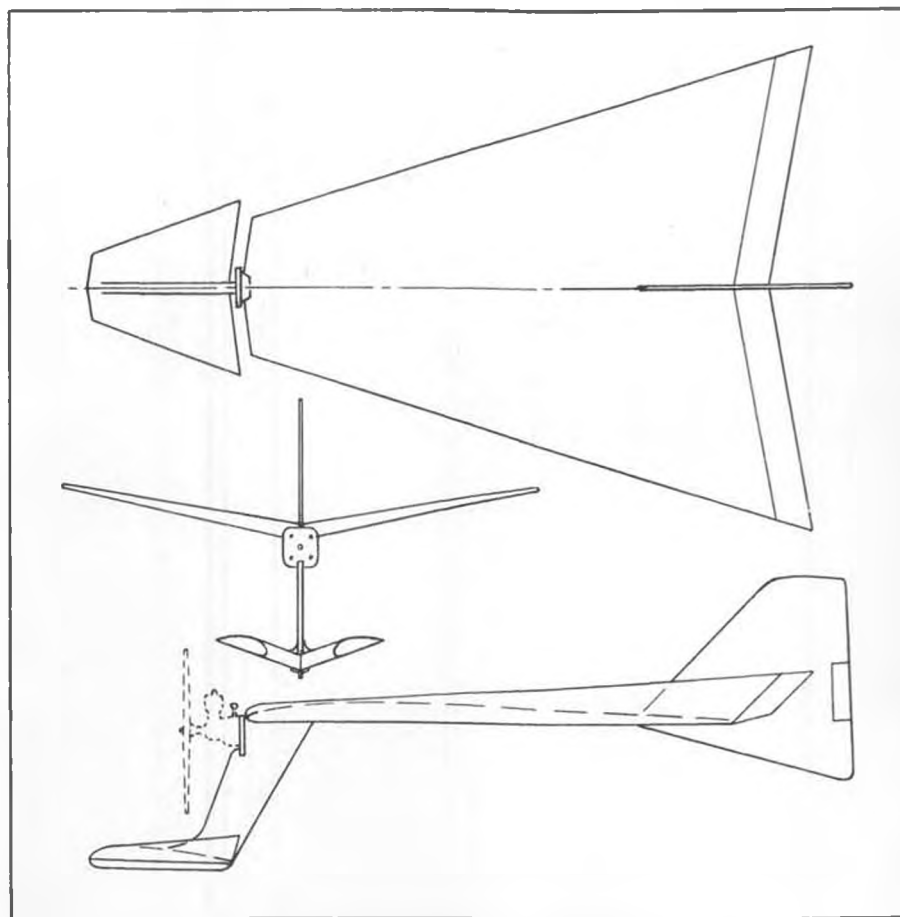
### TOW HOOK MECHANISM

his Superbird, with the following features; increased frontal area and minimum fin area for tighter turn radius, stiffer fiberglass tail boom, different wing/stab airfoils, lighter wing, and an aileron on the outboard wing to control the model's attitude during the catapult launch. According to Jim, the model has a bouyant glide, and appears to gain some noticeable altitude consistently during the launch.

### TOWHOOKS REVISITED

Art Collard passes on this suggestion for circle towing addicts.

He sez: "I don't like the idea of a moveable slot. No one has yet shown me how to hold it to the fuselage to my satisfaction (I have had no trouble with mine. B.S.) I'd rather see a unit which can be mounted in the fuselage and adjust its position fore and aft. Elton Drew's unit has this property. And, by the way, his unit has a good substitute for your plunger incorporated inside his tow unit. I believe his unit would have to be installed in a tilted position to allow for the 15 to 20 degree rake mentioned in your article (March, 1976 M.B.). I have enclosed a sketch of the mechanism. This 'U-Shaped' unit might be cut from 1/4 inch aluminum. It would have two bolt holes in the top for mounting. Metal and plywood plates

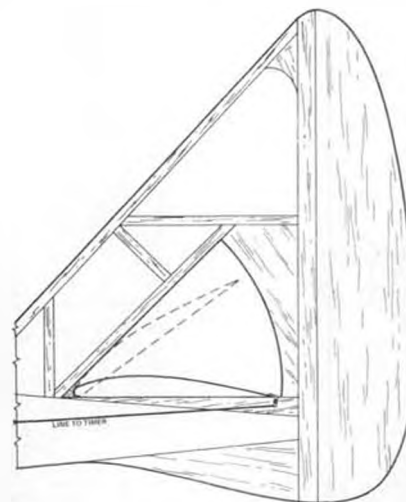


### MYSTERY MODEL FOR SEPTEMBER

would be needed on both sides of the fuselage. Several holes would be located in these plates to make the position of the unit adjustable fore and aft.

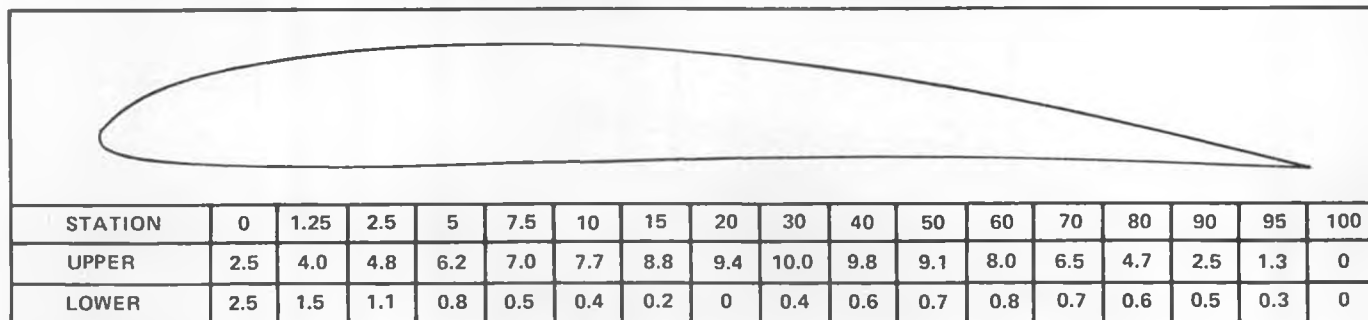
"A slot would be needed in the top of the unit to provide movement of the rotating arm's pivot point. The front of the unit would have a rearward rake of 15 degrees. The bottom would have a slot carved into it, providing for the motion of the rotating arm. The forward motion of the rotating arm could be changed by filling in the front of the slot. The shape of the arm would be the same as you showed in your March article. I'd use the same plunger at the rear end. That's nice .

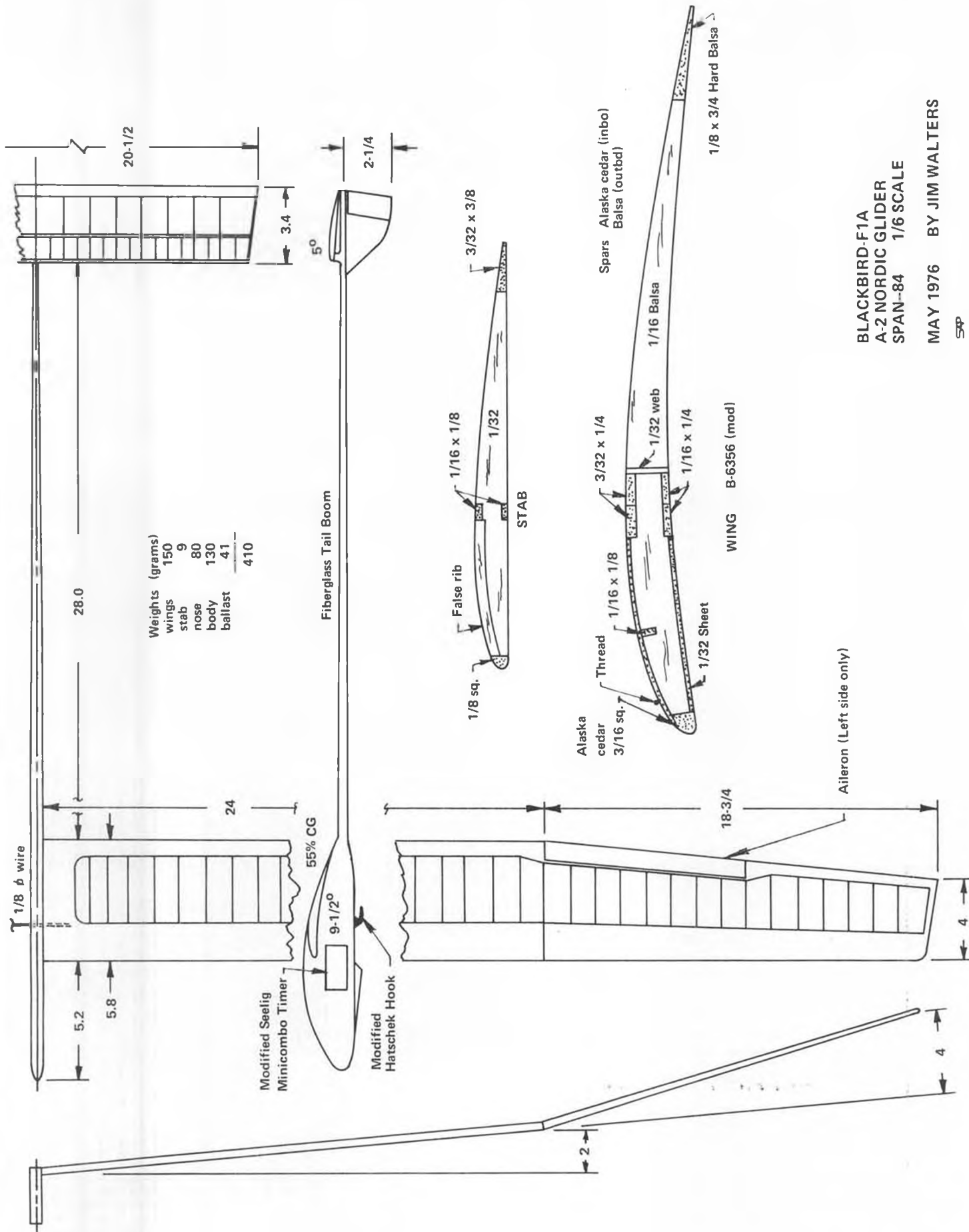
"Elton Drew incorporated the plunger's feature inside his towhook mechanism. Thus, he minimized the weight needed at the tail end."



Modification to Thermic Floater rudder for getting efficient D/T.

### DARNED GOOD AIRFOIL – GOETTINGEN-602





BLACKBIRD-F1A  
 A-2 NORDIC GLIDER  
 SPAN-84 1/6 SCALE  
 MAY 1976 BY JIM WALTERS  
 SWP

**NEW PRODUCTS JUST FOR THE FREE FLIGHTER**

K&W Stop-A-Prop for the new Cox .15: Tom Kerr sends along information and a sample of the new prop brake adaptor for the Cox .15. This device will allow the installation of the effective K&W brake on the new Conquest engine. Simple to install, and available for \$1.50 from K&W Enterprises, Box 18895, Philadelphia, PA. 19119, it's a hard deal to pass up . . . for those of you who have the new Cox product.

Small diameter D.T. fuse: Those of you who got spoiled by the Keil Kraft small diameter d.t. fuse and have tried to find it, only to discover that it is no longer being marketed, will be pleased to hear that Blue Ridge Models, P.O. Box 9188, Asheville, N.C. 28805, is now distributing this fine British fuse. One dollar will get you a big hunk. Add 15¢ to get it mailed to you, unless you order something else from them. They market an excellent Coupe d'Ville kit for \$12.95 p.p., as well as some fine quality Japanese tissue.

**RUBBER TESTING PROCEDURE**

Hard to tell whether that new batch of rubber is worthwhile? Will it break easily? Here's a simple test which was passed on to me by John Lenderman recently

It seems that Jack Block, noted rubber and glider flier, had done an empirical study to determine rubber strength, and he found that if you grabbed a short length of rubber strip firmly between your thumb and forefinger knuckles (use both hands, bunky), and then very rapidly moved your hands up and down (one up, one down) extending the rubber as far as it would go between the movements, this would give you an indication of the strength and durability of the sample. Under 30 such movements before the rubber breaks is considered to be a marginal sample . . . 40 is considered very good. Anything beyond should be bought and stored for ultimate use Using this testing method,

*Continued on page 71*



Bill Lovins, finalist for US Team selection, prepares his Cathexis for practice. Dave Parsons design is powered by Anderson-tuned Rossi and 7.2 x 2.5 AAU prop. Bill Rumley photo.



Where? Here are the Juniors! Cindy (rt) and Debby Kirby took 1st and 2nd in Junior Unlimited rubber. Old man Bill had to be content with 2nd in rubber speed, at Bunnell, Florida meet.



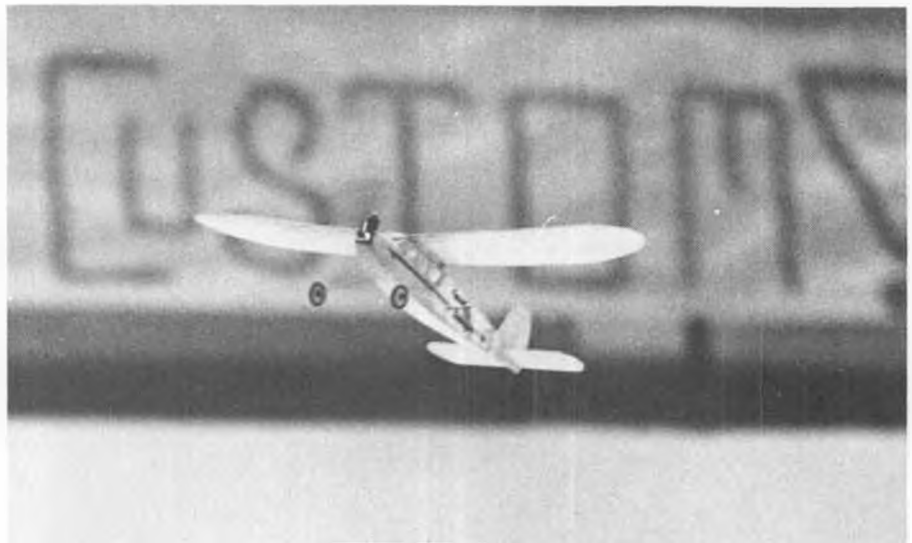
Roving Dave Whatsistrum sent pic of his old 'Pay Later' Payload ship. Sez this is step toward Cargo, mentioned in previous MB F/F column.



Jim Smead, with Senior/Open Hand Launch Glider trophy won at Bunnell, Florida meet. Both Florida photos sent in by Jim Kloth.



Big Bob Stalick, and Little "Miss America". Interesting idea for snowed-in Old Timers.



The "Mini Miss America" climbing out for another 30 second plus flight. Complete set of rules, such as they need be, are included in text. Could be second best thing for long winter nights.

# mini MISS AMERICA

By BOB STALICK . . . During the Northwest's long winter rainy season, the old timer modelers are turning to a new expression of their favorite pastime, rubber powered scale models of the great oldies!

• When the winters sock in the Northwest, and the rains come pouring down . . . thoughts turn to building and flying indoor models, or just building and dreaming outdoor models. Since the rains do pour from early November through June, that does give quite a bit of building time, and flying time, too. Especially if the flying is done indoors.

For the Old Timer flier, there isn't much to do, except build another winter project for the coming summer . . . that is until now, there isn't much to do. The Willamette Modelers Club has sponsored for two years now, an indoor old timer's scale event, and the Miss America presented here is the first model built to these rules. With flights over a half-minute indoors, it comes close to rivaling the Peanut Scale ships in duration, and its appeal is obvious to old timer and your flier alike. Everyone likes to see the Miss America fly.

A gentle roll along the gym floor and

feet later, the tail lifts . . . another foot and the model lifts from the floor and climbs in a lazy left circle, until the power runs out, then it cruises down to a 3-point landing. Sound appealing? It is. The WMC rules for Indoor Old Timer Scale are really quite simple, too.

1. The model will be built to conform to the same categories as established by S.A.M. for Old Timer and Antique events.

2. The model must be scaled down from the original, maintaining similar structural type, airfoils, moment arms, dihedral, etc.

3. The model must be rubber powered.

4. The model must have a wingspan which doesn't exceed 24 inches projected.

5. The model must be tissue covered. No condenser paper or similar covering permitted.

6. No folding propellers will be allowed.

7. The model must R.O.G. The landing gear may be modified to allow for increase in propeller diameter.

8. The model will be judged on fidelity to original plan. Proof of scale rests with the contestant. All areas except landing gear length and engine compartment will be considered in judging.

10. All flights will be judged on duration. Six attempts to make one official flight.

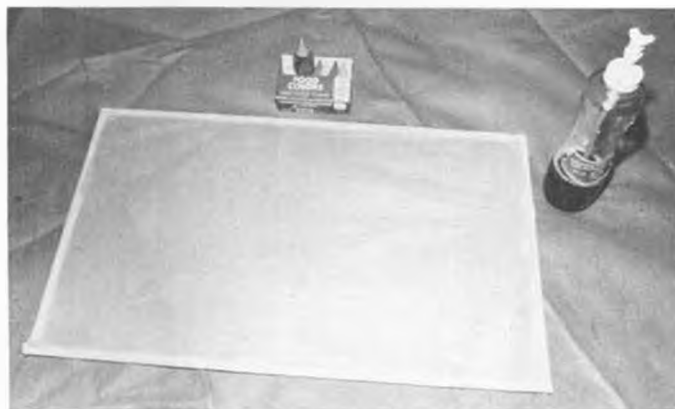
11. An official flight is one which is airborne for 5 or more seconds.

## CONSTRUCTION

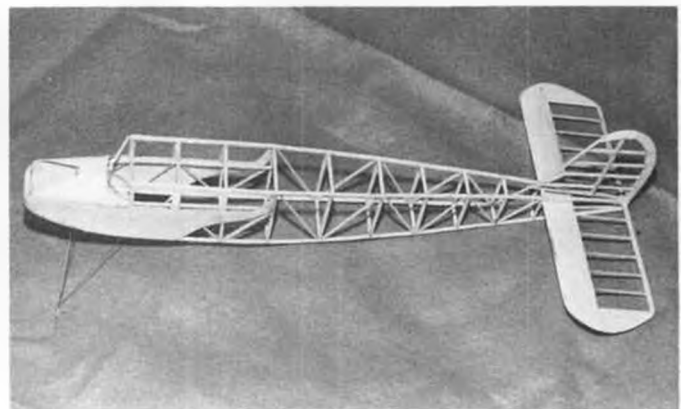
The Miss America builds much like a Peanut Scale ship, and if you've been reading Walt Mooney's articles, this model should prove of little difficulty. Some points are in order, however.

All of the materials used in construction can be purchased at any good hobby shop. The 1/64 sheet balsa

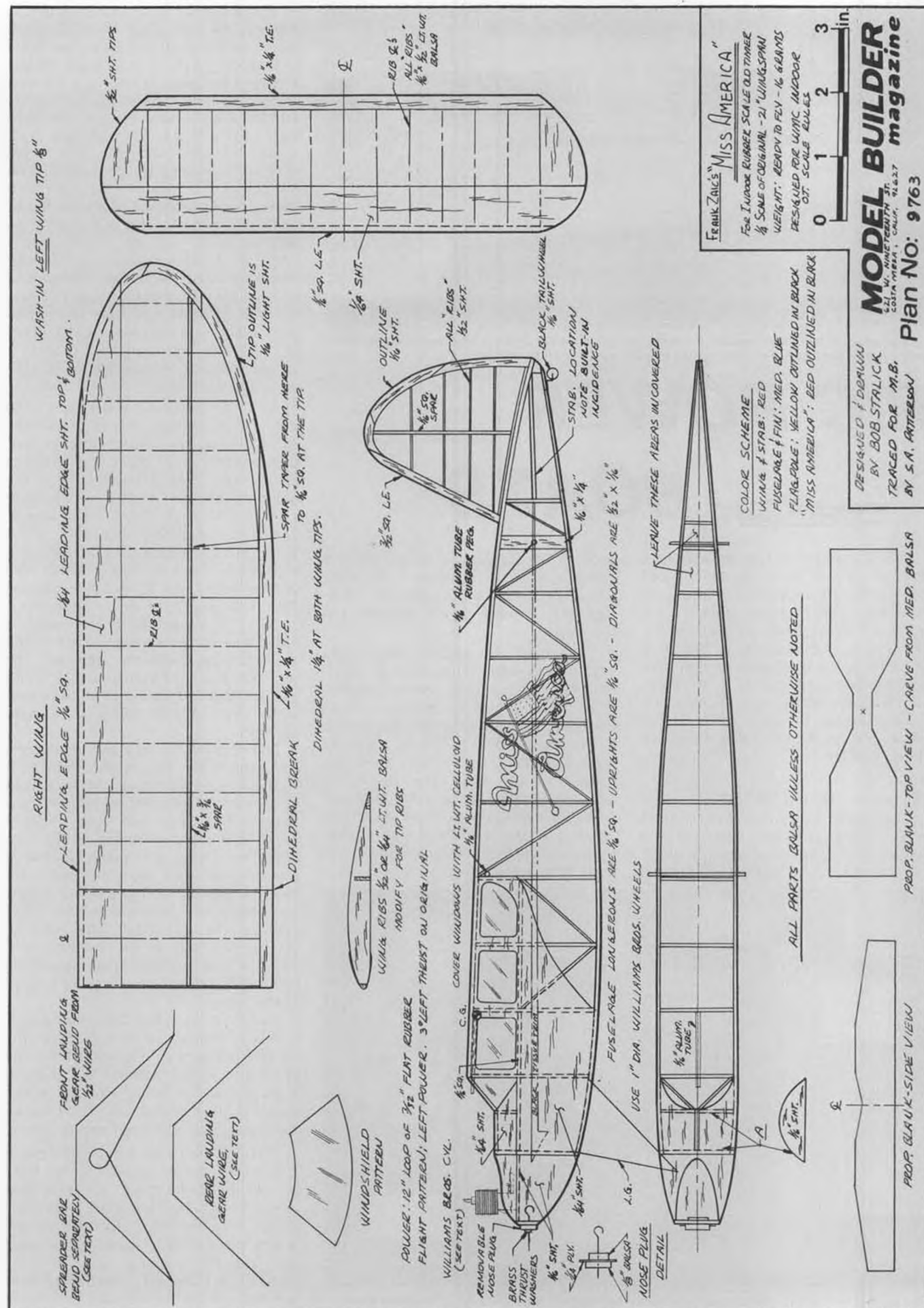
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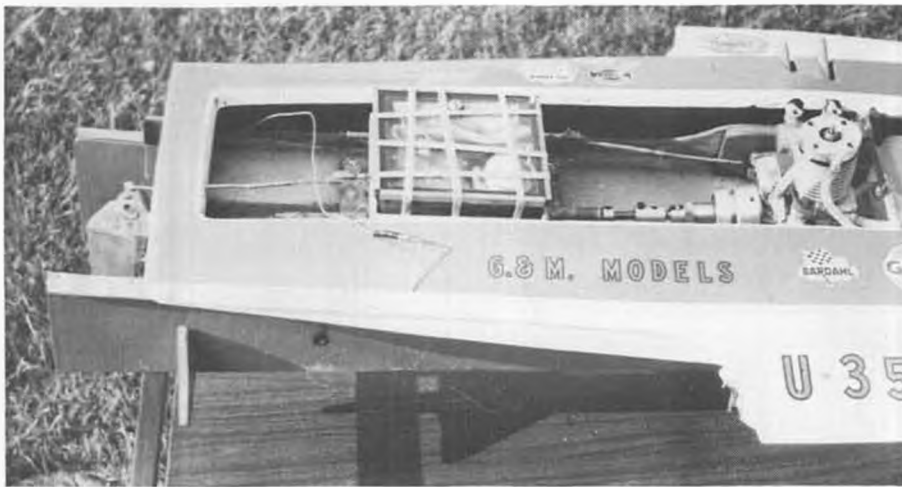


Tissue on frame for dying with dense, sprayed food color. A second spraying may be needed to get desired color. Spruce 1/4 sq. frame.



Basic frame structure follows construction of full size model. Fidelity to structural design affects points earned.





A .19 powered hydro. Note straight linkages, and disconnected antenna wire laying across deck. Water proof radio box is very essential to reliable power boating operation.

# R/C POWER BOATS

By BOB PREUSSE

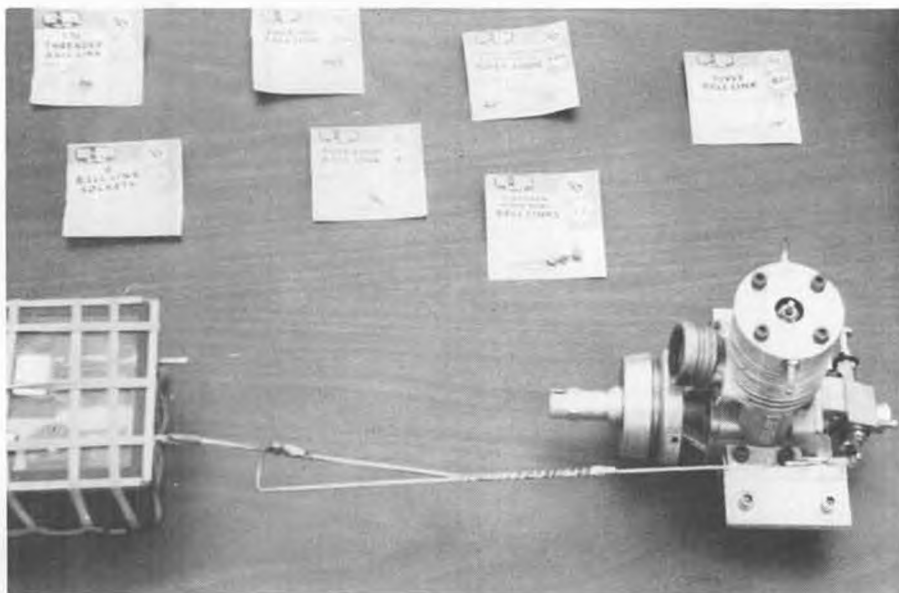
• This is the first in a series of articles designed to help both the experienced and beginning boater develop new skills and ideas. The methods used by the author are by no means meant to be the only way or the best way; rather, they are useful building suggestions that have been proven successful. So I hope you will find some useful suggestions in the reading ahead. Be sure to look for future articles in upcoming issues of Model Builder.

## CUSTOM ANTENNA INSTALLATIONS

How many times have you seen an antenna installation that consisted of a receiver antenna wrapped around a length of 1/16 music wire fastened to a boat

deck or an airplane fuselage? It is a common antenna installation for most beginners because of its simplicity. However, the assembly is cumbersome and unreliable.

A relatively new method consists of a 1/32 music wire whip antenna which detaches from a brass tubing antenna jack that is bolted to the transom of the boat. The beauty of the installation is the music wire's flexibility, and it's small size does not detract from the realism of the boat. The antenna is also detachable so that your boat will fit nicely in your car trunk. A detachable antenna is also a must if you protect your boat with a custom fitted terry-cloth boat cover.



Assorted DuBro ball links, which are very handy for efficient control hook-up in power boats. Note how slight bend in linkage has been reinforced. Offset bends can produce slop.

The materials you will need are as follows: 36 inch piece of 1/32 music wire, two 4-40 nuts and bolts, two 1-1/2 inch pieces of 1/16 O.D. brass tubing, a wiring lug, approximately a 12 inch piece of stranded radio wire, heat-shrink tubing, and 2 washers for the 4-40 bolts. Let's begin the assembly . . .

STEP 1: Determine the total length of antenna needed for your radio. You will find this info in the operation manual (*Or measure the existing antenna, wcn*). The antenna length is usually 36 inches.

STEP 2: If you have a 36 inch length antenna, I would recommend that you divide this length as follows: 6 inches of radio wire from receiver to brass tubing jack in radio box, 10 inches of radio wire extension from radio box to antenna jack, and 20 inches of 1/32 m.w. whip antenna.

STEP 3: Building a water tight radio box will be covered in a future article. At this time, let's make note of only those steps that affect the antenna installation. Drill a small hole in the radio box about 1/2 inch from the lip in a corner for the 1/16 O.D. brass tubing. The piece of tubing should be about 1-1/2 inches in length. This tubing is epoxied in place along the inside wall of the radio box. Be sure it is exposed slightly through the hole for strength.

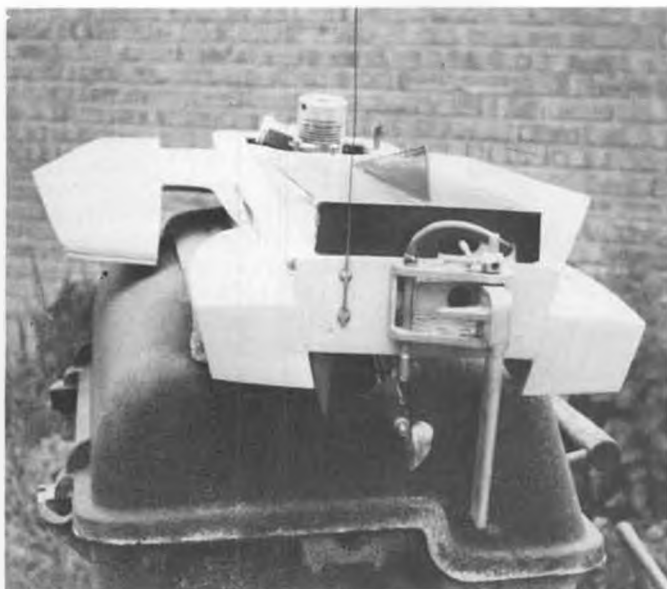
STEP 4: Solder the 6 inch piece of radio wire (from receiver) to the end of the tubing inside the radio box. Be sure this is a good connection. I would also recommend fitting this connection with heat shrink tubing for added strength.

STEP 5: Next, take two 4-40 bolts and groove the slot in the head to a V shape. Loosely clamp the bolt head in a vise and put the V grooves in a straight line. You will then solder a 1-1/2 inch piece of tubing to the bolt heads by laying the tubing in the V grooves. Be sure that the bolts are about 1 inch apart. The piece of tubing will end at one bolt and overhang 1/2 inch past the second bolt. This overhang will be the top of the antenna jack. Also, be sure to sand the tubing and the bolt heads before soldering, for a good connection.

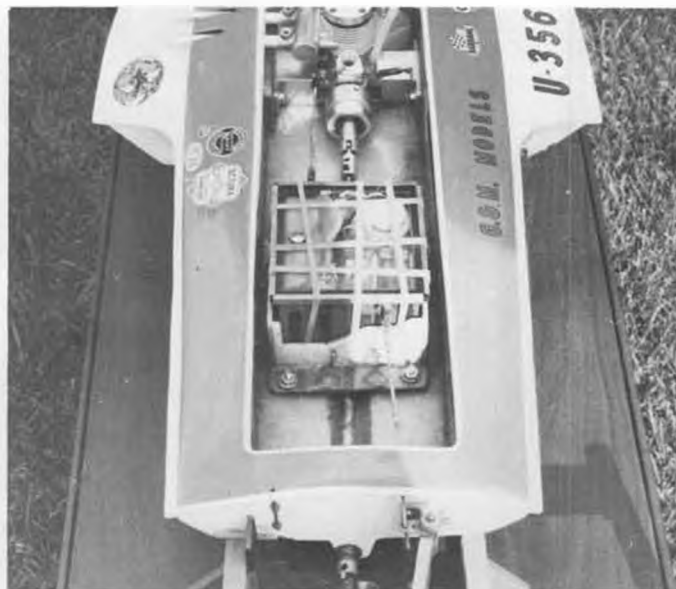
STEP 6: Now that the antenna jack is ready, the next step is to make the 10 inch radio wire extension from the radio box to the antenna jack. Cut an 8 inch piece of radio wire and solder securely to a wiring lug. Then secure the connection with heat shrink tubing.

STEP 7: Next cut a 2 inch length of 1/32 m.w. Approximately 1/2 inch from an end, bend the music wire at a right angle. Then solder the short end of the music wire to the other end of the 8 inch piece of radio wire. Again secure with heat shrink tubing.

STEP 8: The 1-1/2 inches of m.w. will fit into the tubing jack you install in the radio box. Be sure to crimp the



Outrigger hydro equipped with author's transom-mounted wire antenna, as described in text.



Boat in lead photo, viewed from another angle. Again, note straight linkages and waterproof radio compartment.

end of the m.w. slightly so that it will not vibrate out of the tubing.

STEP 9: It is best to mount the antenna jack through the transom of the boat. Watch out for metal noise.

STEP 10: Drill two holes for the bolts in the transom and mount the antenna jack. Slip the wiring lug on the bottom bolt and attach washers and nuts.

STEP 11: Finally, cut a 20 inch piece of m.w. for the whip antenna. Again crimp one end and slip into the jack. Also, put a loop on the other end to protect eyes.

#### CONTROL LINKAGES

First, I wish to thank DuBro Products Incorporated, 480 Bonner Road, Wauconda, Illinois 60084, for their assistance in this project. They have an excellent assortment of threaded and unthreaded ball-link type control arms in stock. I have made use of their control arms in my scale unlimited "Lincoln Thrift" with good results. They are very sturdy and allow for a small amount of mis-alignment.

When making a rudder linkage, it is important to have a straight pushrod. With less bends, the linkage is not as flexible, resulting in more efficient opera-

tion. This also applies to the throttle linkage; however, it is not as critical in this case.

The Du-Bro Ball Link comes in two sizes, as well as threaded and unthreaded versions. Their product has quality parts and excellent instructions. They even give the modeler the drill size (No. 44) to use on the throttle arm of the carburetor so that you can attach the threaded ball link.

Rather than give you a step-by-step procedure for building the linkages, here are key construction points to strive for in assembly.

1. DuBro recommends that you screw the threaded coupler in the nylon link within 1/16 of the bottom. This allows about 1/8 trim adjustment.

2. When soldering the linkage to the threaded coupler, be sure to remove the nylon link, as the heat will melt the nylon.

3. Keep bends in the linkage to a minimum. In a rudder linkage, these bends will allow the linkage to flex under stress, resulting in a loss of movement.

4. Keep the throttle linkage away from the flywheel. If it is too close, you are apt to wrap your starting cord around your linkage and be very unhappy with the results. Never run your linkage across the flywheel, even if the

control arm of the carburetor is on the opposite side of the output on your radio box. Reverse the carburetor if necessary.

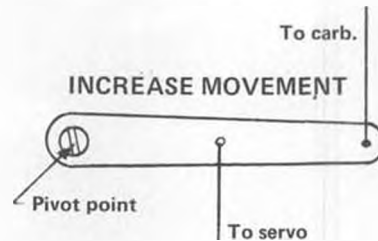
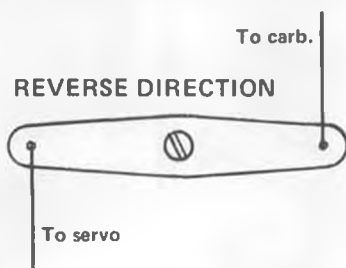
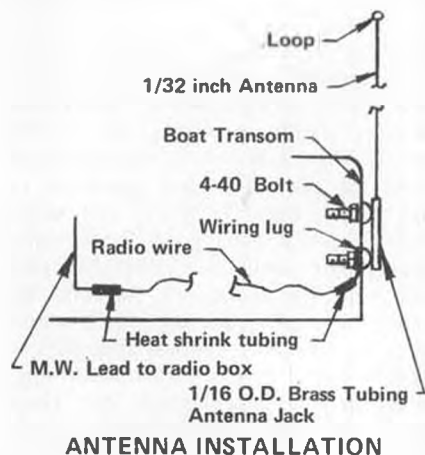
5. Make sure the carburetor and rudder work freely when installed in the boat. Any binds or unnecessary stress is added wear on your servos.

6. For rudder linkage, use at least 1/16 diameter m.w. for strength.

7. Learn to use nylon bell cranks for reversing direction of movement or increasing travel. A 1/2A bell crank (pivot in center) works perfectly to reverse direction of movement on throttles. A bell crank with one arm (both linkages on the same side of the pivot point) can be used to increase travel. The linkage from your servo would hook up to the approximate center of the arm while the linkage to the carburetor would be on the end of the arm opposite the pivot point. The distances can be varied for the desired movement.

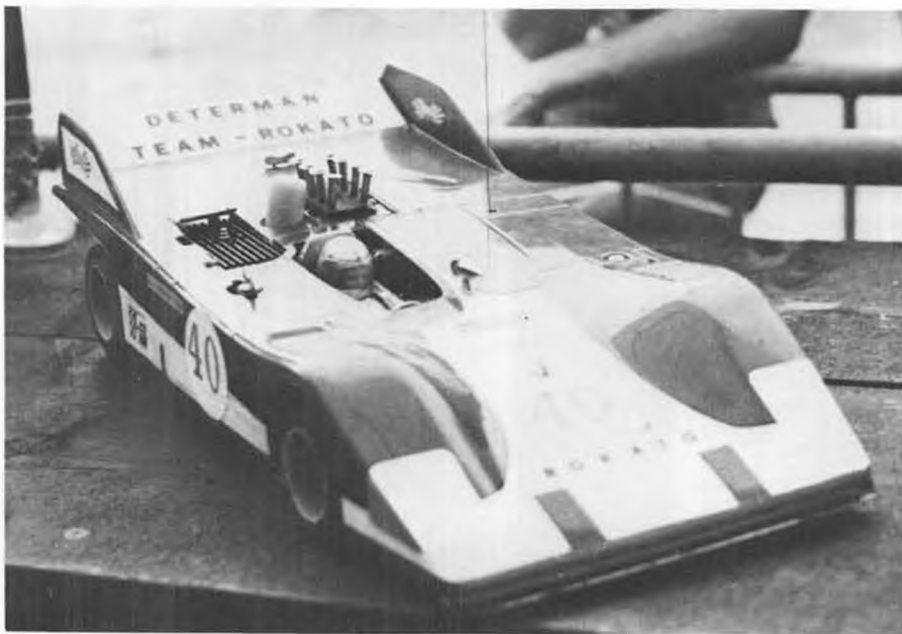
8. Be sure to inspect linkages from time to time for possible wear of fatigue.

I hope this building tip helps you on your next boat or to improve your present one. Until next time . . . HAPPY BOATING!



#### USE OF BELLCRANKS WITH LINKAGES





Ronnie Ton, from Holland, ran this car at Magadino, in the 1975 European Championships. Engine placement hints that something is different.

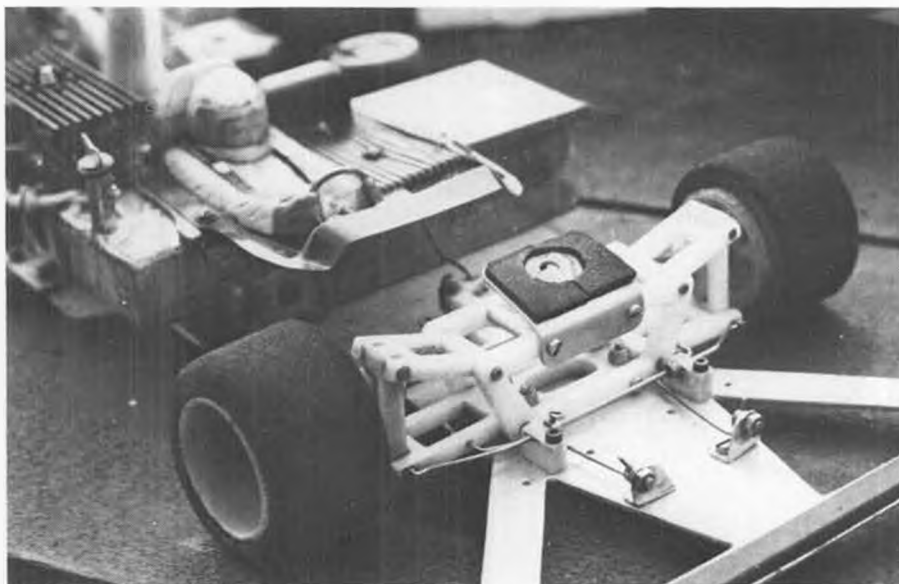
# R/C AUTO NEWS

By CHUCK HALLUM

● Well, everybody, I finally got back to the update on the suspension system series. Quite a bit of this series is based on pictures and comments by Tom Martin. All of the European car pictures were taken in late 1975. So some improvements have undoubtedly been made.

Of all the pictures of cars with suspension systems that I've seen, those of Ronnie Ton's car are the most interesting. The suspension action looks very interesting and rugged, capable of running in competition with a good chance of survival. The old Dynamic suspension car was quite similar but much more fragile, with more parts,

and many nuts and joints to work loose, and no spring adjustments or stabilizer (roll) bar. So the Ton car looks great. All of the suspension parts appear to be made of plastic . . . very sturdy but yet relatively light weight. The front end springs and stabilizer bar are very apparent in the photograph. Both front and rear use upper and lower "H" frames. It appears that the lower frame is longer so that, with deflection, the front wheels develop negative camber, compensating for body roll so that front tire contact during cornering remains good. I can't tell if the rear end has two universal joints on each side . . . but since the upper and lower "H" frames at the rear



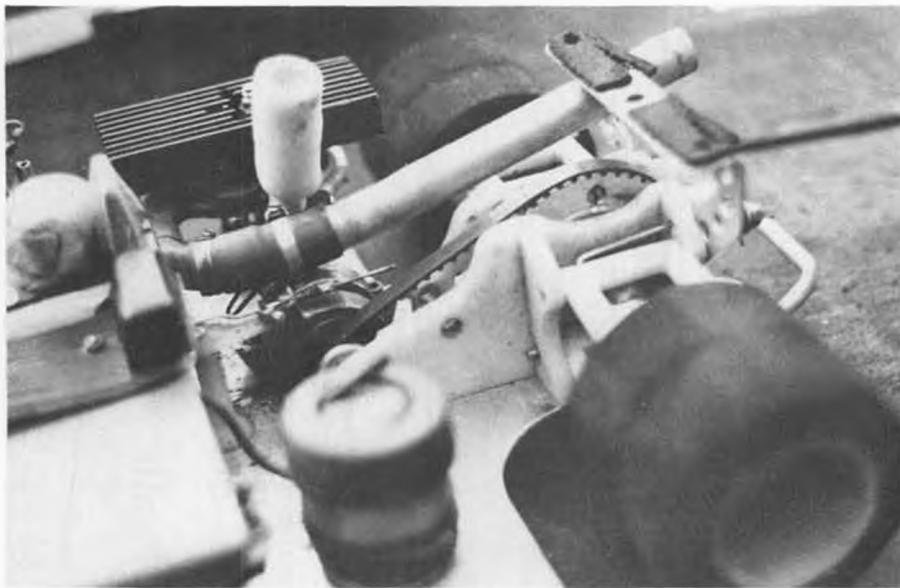
Front suspension geometry of Ronnie Ton's car looks good . . . and rugged. Springs and stabilizer bar are made from piano wire.

are unequal length, there are probably two on each side. So the rear wheels do the same as the fronts. Cog belt drive is used to the fixed rear axle drive pulley. The rear wheel spring is visible in the picture if you look hard. Note the very wide tires on the front. From all appearances, the front wheel kingpin location is well toward the chassis from the inside edge of the wheel.

How does Ronnie Ton's car work? Well, in late 1975, here's what Tom Martin had to say. "This independent suspension car shows marked understeer at high speed and oversteer at low speeds. It hugs the track extremely well, but as speed increases, it tends to lose all steering at one critical speed. Turning off the power causes violent oversteer calling for quick correction." This doesn't sound too good. But with a suspension car, only very minor changes or adjustments may be necessary to change the handling drastically. From the pictures, comments by Tom Martin, and experience with my suspension cars, there are three things which I would investigate.

1. Rear wheel dampers (or shock absorbers). In every suspension car that I have built, there were low speed power oversteer problems until I added rear dampers. What seems to happen is that track surface irregularities, along with power delivery, causes one of the rear wheels to lose contact with the surface and, zap, there is an oversteer problem. Dampers keep the rear tires from bouncing as much and rear traction is improved. The rear dampers may also help the high speed power understeer to oversteer with throttle off. Weight transfer may allow more rear wheel bounce when the throttle is decreased. One must also be sure that during suspension motion the stops are not contacted (bottoming does not occur) . . . which leads us to the next item.

2. Spring and roll rates. The next thing I'd check would be the spring and roll rates of both the front and rear suspensions. To start with, not much motion is desirable. If the weight distribution is about 60% rear, 40% front and an initial motion of a 1/4 inch is assumed, the rear spring rate for a 6 lb. car should be at least 14.4 lbs./in. (7.2 lbs./in. at each wheel), and the front spring rate about 9.6 lbs./in. (4.8 lbs./in. at each wheel). Suspension motion should probably be a little greater than 1/4 inch in each direction from the normal loaded condition, or the wheels may "bottom" (hit stops) during normal driving. If "bottoming" occurs, the wheel will either lose contact with the ground or the load will change abruptly, causing severe understeer or oversteer. Shock absorbers or dampers will help eliminate "bottoming" when driving over bumps, etc. Good shock absorbers would probably allow the use of low spring rates. There are at



Rear suspension has same general geometry as the front. Cog belt drive and rear spring are also visible. Each half axle must have two U-joints.

least four pivot points on each suspension unit for each wheel. So friction will give some damping at each corner. But additional damping may be required.

During cornering, steady side forces can be developed and cause the body to roll. Roll forces should be considered when looking at the "bottoming" problem. Normally, full size cars have a front roll rate which is greater than the rear roll rate, to give better rear traction (but in model cars, with narrow or hard front tires, this may not be true).

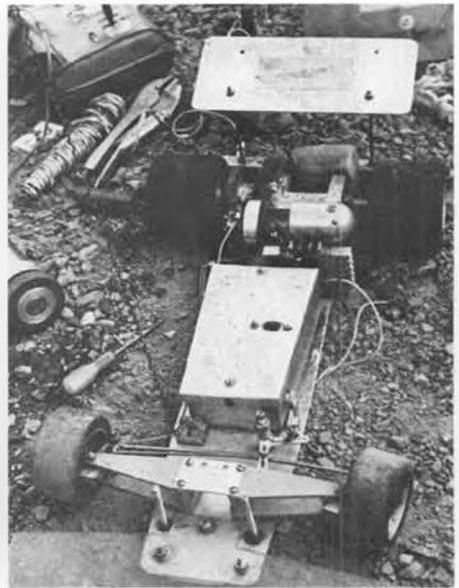
A bigger stabilizer bar in the front will accomplish this, or a higher-than-normal spring rate would do about the same thing.

3. Front wheel kingpin location. From what can be seen in the pictures, deep dish front wheels and flat wheel back side, the kingpin location is toward the chassis from the inside surface of of the front wheel. Very large servo forces must be generated to overcome wheel turning forces because of the kingpin location and the wide front tires. The kingpin location should be well toward the center of the tire contact patch or no servo that I know of will provide enough force to turn the

wheels at high speed, hence high speed understeer.

So, my suggestions for Ronnie Ton's car would be to redesign the front end a little to move the kingpin location toward the center of the tire contact patch. The kingpin location shift should solve most of the high speed understeer problems. Very probably the switch from high speed understeer to oversteer is caused by the rear end lifting up so that the suspension hits the bottom stop, or the spring rate changes drastically and a rear wheel lifts. Good rear dampers will help this situation. A higher rear spring rate may also be advisable. The rear dampers will also probably help the low speed power oversteer problem.

Another interesting front suspension is the unit, pictured, from the British P.B. "Dual" kit. This is a dual transverse leaf spring arrangement made of molded nylon. The equal length upper and lower cantilever springs keep the wheel camber about constant during wheel motion. Some damping is inherent within the plastic, so shocks may not be required. The unit looks reasonably rugged. The only thing which appears to be question-



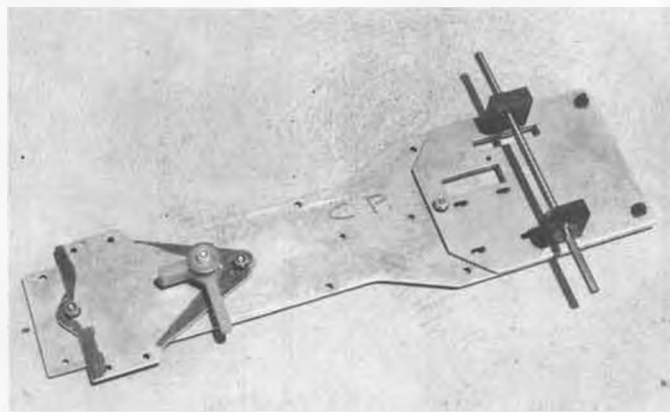
P.B. "Dual" kit from England, has molded nylon cantilever leaf spring front suspension.

able to me is the kingpin location. I believe the front suspension would give better performance if the kingpin location was moved inside the wheel and within the tire contact patch.

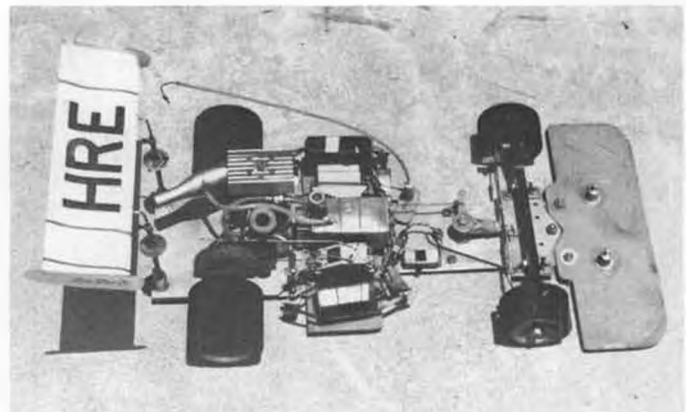
At the 1976 McCoy race in Pomona, I saw a very interesting suspension car from the San Francisco Bay area. The rear suspension was quite similar to Ronnie Ton's car. I didn't have my camera with me, but the fellow said he'd send me some pics. Sorry to say I haven't received any and I didn't get his name. Anyway, there are more guys out there working on suspension than you realize. The S.F. car worked quite well but there were still problems with the rear universal joints. If any readers know this fellow, or anyone else with a suspension car, see if you can get some pictures sent to me. I'm sure other people would like to see what's going on.

My latest suspension car is really a hybrid, or something between a standard plate chassis car and a suspension car. It is called an RS car, for "roll suspension" or "rocker suspension." There are rocker plates both front and rear. Some pictures of the car show what the

*Continued on page 66*

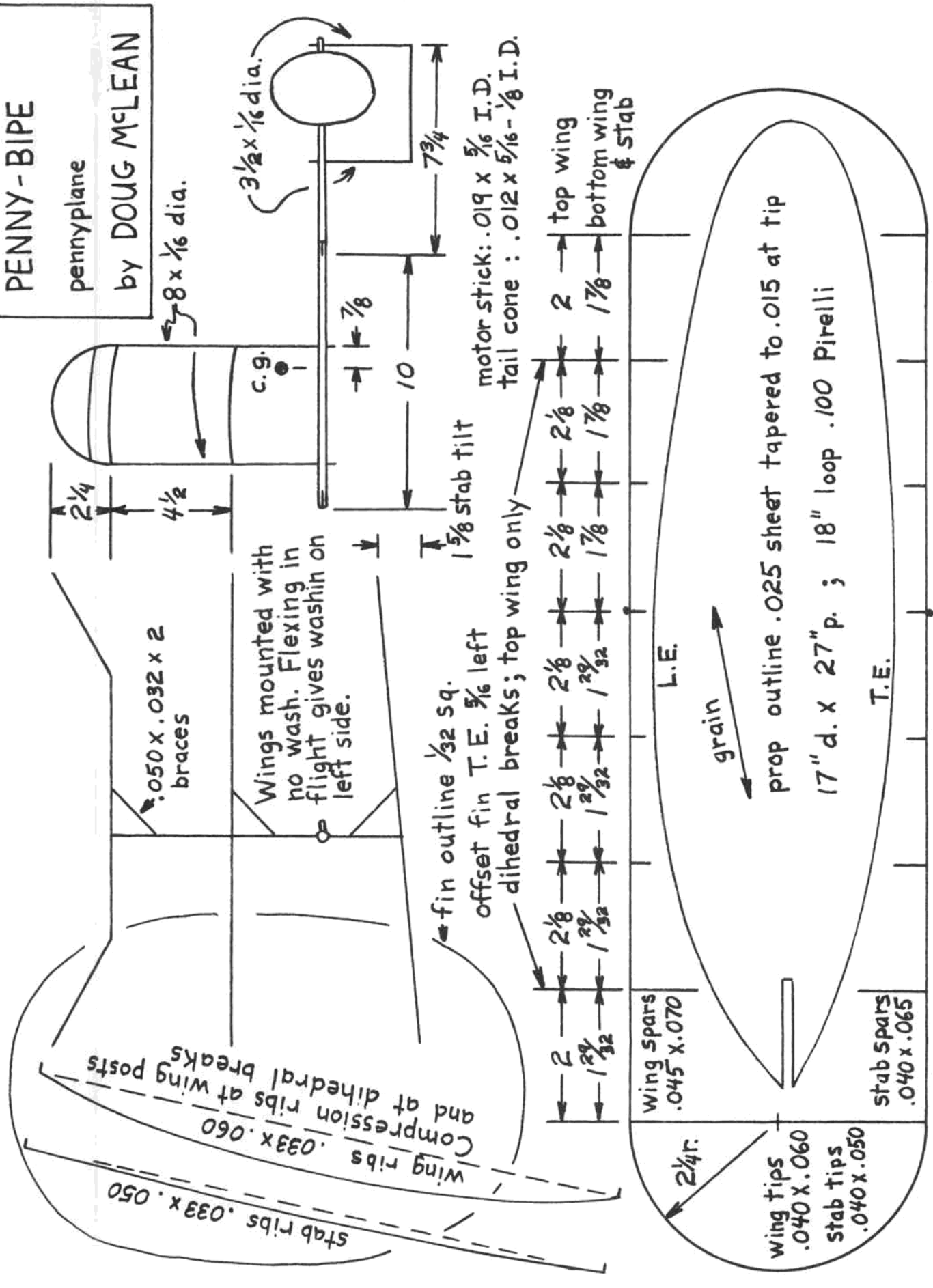


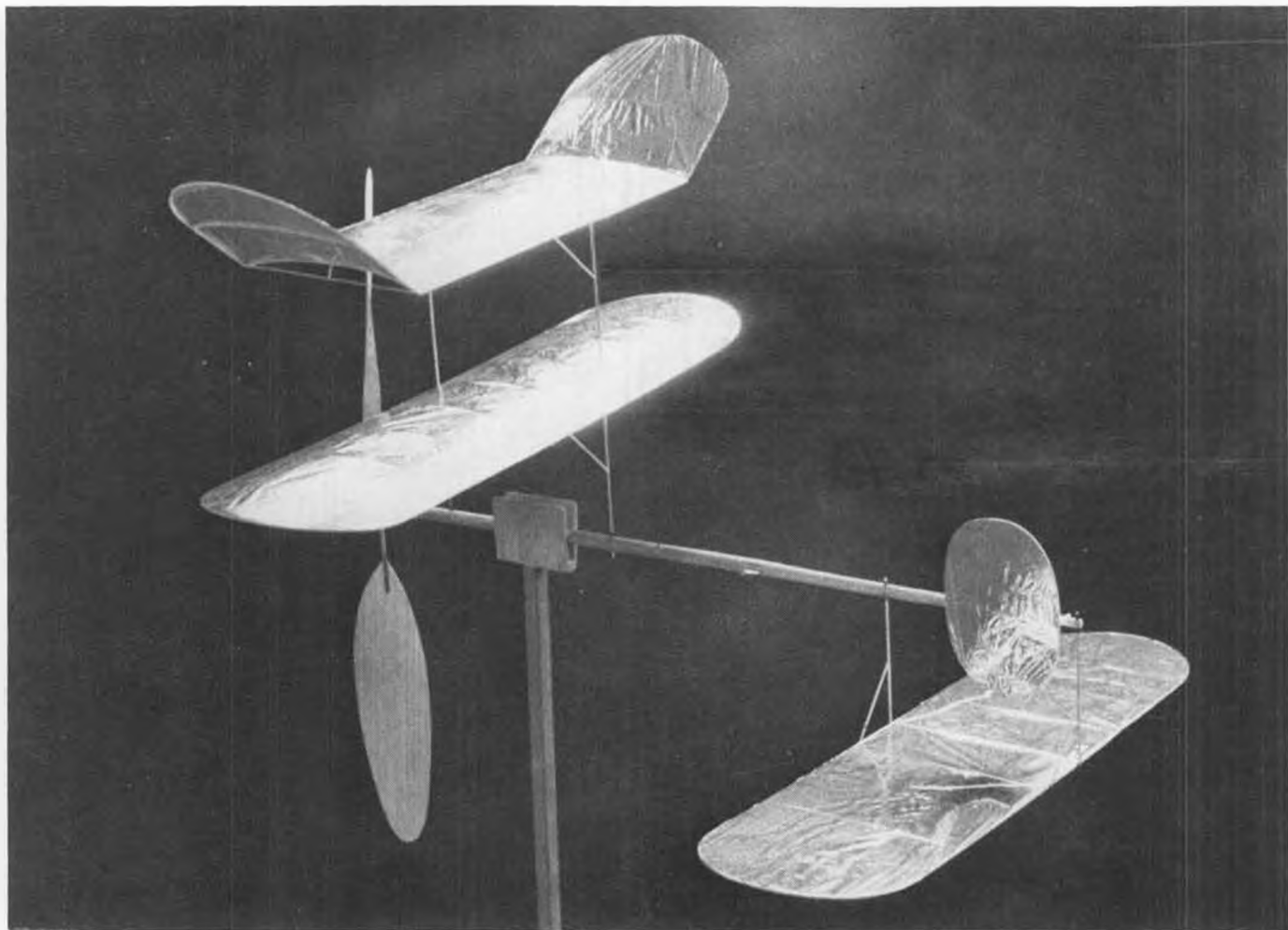
Chuck Hallum's new front and rear roll suspension car chassis set-up. Front and rear rocker plates and attachment points are apparent.



Chuck's completed car and component layout. Foam rubber between rocker plates and chassis, roll rate controlled by bolt tightness.

**PENNY-BIPE**  
pennyplane  
by DOUG McLEAN





## THE *Penny-Bipe*

By DOUG McLEAN . . . Wouldn't you know? Bipes have invaded the indoor Pennyplane class, and are once more proving that "Two Wings ARE Better!"

• The Penny-Bipe design is the result of theoretical calculations using a method I developed a few years ago for estimating indoor model performance. The method has proved to be reasonably reliable for predicting the performance potential of new designs and has saved a lot of trial-and-error building effort. The calculations indicate that the biplane layout has the best potential of any penny-plane design I've looked at so far, and flight results have been encouraging. In June, 1974, the Penny-Bipe won the V.G.M.C. (Vancouver, B.C.) penny-plane event with a flight of 12:29 under 65 feet of usable ceiling height. In July, 1974, I had a chance to fly it at Lakehurst on the last weekend of the Aerolympics. Its best flight was 16:03, with a climb of about 110 feet. I think that someone who's better at building props than I am should be able to do about 18 minutes with it in a high ceiling site.

Construction follows conventional indoor practice. The covering on my model is silver microlite. The wing posts should be made of the stiffest

balsa you can find (I used 18 lb. stock). For the stab parts and everything else at the rear end, choose light wood, or you may have balance problems. I consciously tried to keep my model light, and it weighs exactly one penny with no ballast required. Weights of the major parts were: stick with fin .72 gram; wings with posts 1.13 grams; stab with posts .46 gram; and prop .80 gram.

Don't be tempted to shorten the wing posts or eliminate the stab posts. Without the large vertical gap between the wings and stab, the c.g. would have to be moved forward (or the wings aft), and the stab would no longer carry its share of lift. This makes a big difference in performance.

One unusual feature you'll notice on the drawing is that I mount the wings with no washin. The success of this scheme depends on the wing spars having the correct flexibility to assume the required washin in flight. When the flexibility is right, you get increased wash-in during the power burst, when it's needed, and reduced wash-in during

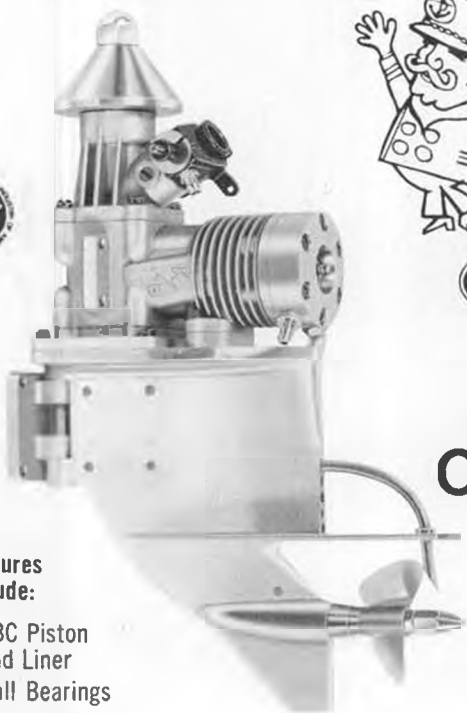
cruise, resulting in less drag. I always measure the flexibility of the spars before I assemble a wing frame. First, I clamp the spar to a flat surface with  $4\frac{1}{2}$  inches of spar extending beyond the edge, using a flat-bottomed paper weight to hold the spar so that only the protruding  $4\frac{1}{2}$  inch length is free to flex. Then I hang a 2 gram weight (a coil of solder) on the end of the spar and measure the deflection. Spars that have worked well for the Penny-Bipe deflect about  $\frac{3}{8}$  inch during this test.

Another unusual feature is that the incidences of both the wing and stab are adjustable. In effect, this amounts to having an adjustable thrust line. For example, if you increase the incidences of both surfaces by equal amounts, the relative angle between them will be unchanged, and cruise trim will change very little. But the relative thrust line change will have the effect of adding downthrust, and climb trim will change. By careful adjustment of the two incidence angles, the model can be made to handle the maximum torque of .100 Pirelli with a steep climb and very little wasted energy. •

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R/C Auto . . . . *Continued from page 63* plates look like, and how they are attached to the chassis plate. Foam rubber and the tightness of the bolts going through the rubber grommets provide adjustment of the front and rear end roll rates. The RS car is considerably better than the simple plate chassis, but probably less effective than a real suspension system. The worst thing, technically, is that the engine is part of the rear rocking weight. Vertical springing would be bad, but relative front to rear roll rates for the majority of the car weight is provided.

The real "proof of the pudding" is whether the car works. The performance

of the RS car is enough better than the standard plate and flex plate chassis that this is what I'll be running at the 1976 ROAR Nats in the Open Class events. By the time you read this article the car will also be available through HRE.

The RS car seems to handle the power of the new K & B 21 (3.5 cc) very well with little power oversteer and lots of stability. Adjustable front and rear roll rates allow a racer to vary the relative amounts of front and rear bite so that oversteer and understeer problems can be corrected with something other than tire compounds and widths. Too often, soft front tires have more than enough bite and bad wear, and medium fronts

don't have enough bite (and wear sometimes). Now I can select the tires that I think are best and "dial" the handling in by front or rear roll rate adjustment.

The roll rate adjustment is rather crude, but simple. Foam tape is placed on the chassis, toward the outer edges, under the rocker plate. Tightening up the bolts going through the center-positioned rubber grommet pivots puts some pre-load on the foam rubber. With this initial set-up, there is some amount of roll rate. The pivot bolts can be tightened to increase roll rate, or loosened a little to decrease roll rate. The bolts should never be sloppy, so if a lower roll rate is desired, the foam tape has to be moved toward the center of the chassis to decrease the restraining tongue. Like I said . . . crude but simple.

Current set-up procedure for the RS car is to use the best traction rear tires and relatively soft front tires. After a checkout run I can increase the relative front bite by decreasing the front roll rate, or decrease the front bite by increasing the front roll rate. If outside front tire wear is considered a problem, I can switch to a narrow soft inside front tire . . . or go to medium hard front tires. Since the RS car is torsionally more flexible, differential tire wear is not as critical as on a basic plate-type chassis. For very slippery (dusty) tracks, medium or hard front tires are used.

Well, that seems to be where things are on the suspension front. If you have questions, comments or *pictures to send*, please contact me c/o Model Builder, or send to Chuck Hallum, P.O. Box 4658, Irvine, CA 92716.

**Choppers . . . .** *Continued from page 21* didn't seem to produce the same smoothness that we now see with these flexible plates . . . perhaps it was because there was no returning force applied to the blades once they flapped up.

For the first time, in building dozens of model helicopters, I found myself actually enjoying working with the plastic body shell. Usually the parts don't fit too well, and you end up with a flimsy body that will crack-out on the first landing. Not so with the Baron. The shape and size is pleasant to work with, the material is husky enough to withstand lots of abuse, and the parts fit together perfectly to form an easy-to-install body. Only 3 machine screws, located at strategic suspense points, need be removed to slip the body shell off the chassis in order to get at the entire radio system.

Upon opening the box, you'll find all parts are neatly tucked into their respective plastic pockets, with the larger parts, such as rotor blades, landing gear, tail boom, etc, all taped to the underside of the parts tray. A very simple plan sheet is enclosed, and is small enough to pin on the wall above your workbench for ready reference. A 20 page instruc-



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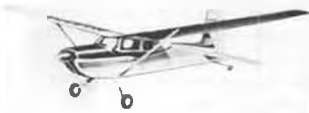
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DEALERS INQUIRIES INVITED

tion booklet is also provided in an unusual format to guide you through the building phase. The first three pages contain 15 photographs of the parts and components, along with identification numbers which can be compared with an extensive parts list in the rear of the booklet for quick identification. From this point on, you assemble the chopper by reading a one or two-sentence instruction, and looking at the picture which accompanies the instruction. Would you believe there are 80 simple steps and 80 photographs to examine in order to build this machine? What could be easier? All in all, this instruction book has to be the best idea for the beginner

that I've seen. Oh yes, there are a few sketches thrown in for good measure, in case the photos couldn't tell the whole story.

After checking out the parts against the parts list, I began construction by the book, just to see what difficulties the beginner would have. As we progress through the construction, I'll refer to the individual steps as they occur in the manual. Only those steps which presented a slight problem will be mentioned.

STEP 3: When fitting the cooling fan onto the engine, make a trial fit of the taper spacer to the bore hole of the fan. My bore hole had a small burr which had to be cleaned out, and I lapped the two together with fine grinding compound to make a perfect fit. A good way to check the fan for accurate fit is to remove the glow plug from the engine and watch the fan closely as you spin it around. It should track perfectly, otherwise you'll get vibration when the engine is running.

STEP 4: I was surprised when installing the pulley and clutch, since I could find no threaded holes in the fan for attachment. The dawn came when I discovered the bolts made their own threads as they are screwed into the plastic fan hub!

STEP 5: When mounting the engine on the aluminum plates, I found it

necessary to slightly round the edges in order for the plates to fit snugly under the engine lugs. Just file off the sharp edges.

STEP 11: This was difficult to understand at first, however, further downstream I found it was necessary to make sure the engine shaft (as mounted in the frame) was pointed directly into the center of the bearing mount which held the main pinion spur gear. The easiest way to secure alignment is to use a straight edge rule across the length of the engine mounting tabs on the main frame and make certain the rule falls directly between the pinion gear mounting holes in the top of the frame. (See photo in instructions). Another way is to actually assemble the engine, clutch, clutch bell and pinion gear, and bearing assembly into the frame temporarily, and file the engine mounting tabs until a smooth running clutch is attained.

STEP 16: Install clutch bell to pinion gear shaft with 2, 4mm set screws rather than 14mm screws.

STEP 17: Bearing 626DD was not identified in the instruction manual, but is already encased in its proper plastic holder.

STEPS 23/24: Final fitting of the engine, cooling shroud, fan, etc., into the frame is not easy, but removal of the rear spacer will help your fingers to stuff it all together into the frame.

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STEP 34: I would suggest the top servos (aileron/elevator) be mounted as close together as possible and trim the mounting board to provide maximum body clearance for steps 71 through 77.

STEPS 39/40/41: The bearings in the tail rotor transmission are deliberately fitted tight. Assembly is made easy by using a drill-press or vise as an arbor press to push the bearings firmly into the plastic case.

STEP 42: Remember the tail rotor hub is screwed onto the output shaft with left-handed threads. Use Loctite here, just to make sure it won't come loose.

STEP 44: When installing the set screws in the tail rotor transmission, refer to Step 5, and realize that one of the set screws must fit into the tail-boom slot. Therefore, be sure that particular set screw is aligned properly to fit the slot.

STEP 52: The tail drive shaft guide will fit properly at approximately half-way down the tail-boom. Put the recessed end toward the tail rotor to make it easier to install the drive shaft from the rear.

STEP 58: When clamping the fiberglass tail boom in the aluminum side plates, be careful not to tighten too much or the boom will crack. It might be necessary to hold the tail boom in place with cement, since it cannot be

clamped tightly. My personal fix was to turn a wood (or aluminum) plug to fit inside the tail boom at the clamping position, to absorb the load of the clamping action.

Well, there you have it, except for trimming and flying, which is quite conventional. The long body shell makes it easy to shift batteries and radio to achieve proper balance. Flight characteristics were excellent, and only a minor tail rotor trim adjustment was required. On our first test hops, I suspected the clutch was slipping because of very little lifting action and the known wide clutch spacing. Increasing the main rotor blade angle of attack by about 1 to 2 degrees, however, cured the problem. If you run into the same thing, you might consider lining the clutch bell housing with a very thin strip of leather to cause earlier clutch engagement.

By the time you read this article, the MRC/Kalt Baron will be making its appearance on your dealer's shelves, at a suggested retail price of \$229.95. At that kind of money it's a real buy for the guy who wants a helicopter but can't come up with the big cash! Of course, spare parts and replacement items are available from your dealer or directly from MRC.

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Model Rectifier Corporation. This is the Dieter Schluter-designed training platform, used in learning to fly the Heli-Baby and Super Heli-Baby choppers. After having assembled and tested a production model, I can honestly say that it is a worthwhile investment for the beginner, especially one who lives in the middle of nowhere and has no experienced instructor to teach him the fundamentals of helicopter flight. Clubs would also find it invaluable for the same reason.

Although specifically designed for the Heli-Baby and Super Heli-Baby, it seems reasonable that it could be modified to accommodate many other heli-



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**JIM CROCKETT REPLICAS**  
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copters (the MRC/Kalt Baron for example). The base is a wood platform about 2 feet square, which sits on 4 steel tubing legs. The legs are held in place with wing-nuts and may be positioned on uneven ground for good support. The mechanics of the trainer is an ingenious yoke arrangement (complete with attachment brackets) which straddles the Heli-Baby from under the tail boom and permits the helicopter to pivot in any direction on ball-bearing supports. The yoke is attached to a center-rod which has a 10-inch vertical capability, as well as unrestricted turning.

This arrangement permits the Heli-Baby to be quickly attached to the

platform and the student taught to master the controls one at a time or all together. The axis of freedom includes; (a) pitch, up and down; (b) bank, left and right; (c) turn, left and right; (d) vertical, ascent and descent. The various axis can be blocked-out or restricted so that individual controls may be used regardless of the position of the others. In any event, it is impossible for the pilot to get his chopper into trouble, while at the same time, he has complete freedom of flight except for movement over the ground. The instruction book which comes with the platform is very well detailed in construction and ways of teaching yourself how to trim and fly the helicopter. The Schluter Training Platform is now available at your hobby dealer for \$64.95.

### FINAL APPROACH

This time next month, I hope I'll be on vacation in Madrid/Cairo and Casablanca . . . I even have plans to take my Jet Ranger along, customs permitting. In the meantime, I have a new Super Heli-Baby kit, with collective pitch, sitting on my workbench . . . now if I can just get that bench cleaned off . . . ●

Counter . . . . .Continued from page 9

grabbing the spinner or throwing a rag into the prop? We feel that this is asking for trouble, and have wondered what AMA insurance has to say about it.

What these guys need; what we all need, is a product now available from Space Age Fuels (makers of Nitrotane) called 'STOPPIT'. It is a safe and simple 6 ounce pressurized container equipped with a rigid 5 inch tube nozzle. In use, a short blast into your running engine's carburetor will stop it instantly, whether it's idling or "shaft-running" minus prop blades.

'STOPPIT' is specially formulated to stop the combustion processes without the ill effects of leaning or flooding the engine to stop it. It contains built-in lubricants, further beneficial to your roaring pride and joy.

As with all aerosol type containers, do not throw it into fire, or incinerate (fold, spindle, or mutilate?). Use with adequate ventilation, and avoid prolonged or repeated breathing of the material. Keep out of reach of children.

NEW, from Space Age Fuels, RR 3, Kewanee, IL. 61443.

\* \* \*

If going fast and turning left is your idea of fun, you'll be interested in a new Super LR-1A Formula One fiberglass and foam kit available from Speed Glass Products.

The polyester fuselage includes such desirable features as installed cheek cowl holding pins, cheek cowl with exhaust exit molded in, molded rear exhaust pipe saddle, and a molded

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cockpit floor with instrument panel. Included also are the wing cores, formed aluminum landing gear, wheel pants, a canopy, as well as full sized plans and templates. The price is a reasonable \$50.

Designed and raced by Ed Allen, who can be contacted for more information at Speed Glass Products, 3445 Deleone Rd, San Marcos, CA. 92069. (714) 727-2502.

\* \* \*

Following in the slipstream of its popular foam 'Cardinal' and 'Super Chipmunk', Midwest Products Co. has announced an all-molded advanced trainer and sport plane called the 'Attacker'. Designed for fast assembly, the Attacker is capable of performing most of the AMA pattern maneuvers when powered by a .19 to .35 engine.

The kit contains all the necessary building materials, illustrated plans, and all the hardware required. Address your inquiries to Midwest Products Co, 400 S. Indiana, Hobart, IN. 46362; tell them MB sent you. ●

F/F . . . . . Continued from page 57

John tried it out on the new Sterling rubber strip, reported in the August Model Builder. Result: Not 20, not 30, not 40, not 50 but over 60 movements and it still hadn't broken. Good sign. Our initial experience with the rubber . . . flown in a Coupe d'Ville unlimited

rubber model, was good. Seems to have reasonable power, but we never wound it to the breaking point, so more testing will have to happen.

### REVIEW OF DARNED GOOD AIRFOILS

The DGA series of airfoils has been a feature of this column since January, 1974. Periodically, I receive questions from people wanting to know whether, such-and-such an airfoil has been detailed, and if so, what issue, etc. etc.

So, for these fine folks, here is a listing of all of the airfoils covered to date, and the issues in which they were covered. You can use this list to help you determine which back issues of Model Builder to buy. (How's that for a plug, Bill? *(Just fine. See ad in this issue. wcn)*)

- Jan. '74, Thomann F-4
- Feb. '74, Neelmeyer
- March, '74, NACA 4407.5
- April '74, Samann-Bussard II
- May '74, Mountie
- June '74, EJ-75
- July '74, B-8353 b2
- Aug. '74, CH-407 mod
- Sept.-Oct. '74, Go. 400
- Nov. '74, GF-6
- Dec. '74, G-610b
- Jan. '75, RSG-29
- Feb. '75, Lucky Lindy
- March '75, Clark Y
- April '75, B-6405b

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- May '75, Cheesman 20A-08
- June '75, Go. 359
- July '75, B-7457 d2
- Aug. '75, B 6356b
- Sept. '75, MVA 439
- Oct. '75, Go. 795 and Go. 796
- Nov. '75, Go. 801 and Go. 803
- Dec. '75, MVA 123 and Go. 495
- Jan. '76, Shoaf
- Feb. '76, B-6456 F
- March '76, Eiffel 400
- April '76, Lindner Stabilizer Section
- May '76, G-9071
- June '76, Pladuska
- July '76, Davis A
- August '76, B-9304 b

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Sept. '76, Go. 692

**"BEAT HENRY STRUCK" CONTEST**

I've always enjoyed the little bits of humor which creep into our modeling world. Seems it helps remind us that this is a hobby and that if we take it, and ourselves, too seriously, we actually spoil the whole purpose of the sport for us and for others. It is with some pleasure that I note the "Beat Henry Struck" meet being sponsored by the Glastonbury Connecticut Modelers and SAM. This contest will be held on Oct. 17, 1976. Contestants must fly a Struck designed free flight, any of his

64 published or kitted designs during the past 40 years of modeling is eligible.

Postal entries are to be flown on the same day, so if this makes your tiddly wink, write for entry blanks to the C.D., George Armstead, Box 524, Glastonbury, CT. 06033. Rules are that the model must fly according to whatever rule was in effect at the time of design. Struck's times will be posted at the end of the contest and called 100%. The flyer with the score closest, over or under, is the winner. Many of the plans are available from John Pond, or you might just have a Sinbad kit hanging around (Sig still

makes 'em). How about digging up that original 1942 Apache that you put away when you went off to fight the war. (How about last month's "Record Hound"? wcn) Sounds like fun!  
**DESIGN YOUR OWN 1/2A GASSIE— Part III**

Well, here we are again with our "let's design a world beater even though we know better" article. By now, we should have in mind what kind of design best suits our needs and tastes. Now what?

How high the Pylon? How deep the downthrust?

Very few designs are pylon-free. There are exceptions of course: Ralph Ray's "Apache" and Norm Getzlaff's "Amen" come to mind. But the pylon effect is present even in these designs due to the highly dihedral wing and/or high down-thrust angles. High thrust ships have a pylon. Pylon ships, of course, have a pylon. How high should it be?

First off, why should there be a pylon at all? A pylon serves the purpose of making your model spirally stable . . . it controls and directs the prop wash of that 22K screamer you've bolted to the firewall. Additionally, through parasol effect, it also can aid in the glide. Pylons usually range from 1/4 to 1/2 chord in height. Example: an 8 inch chord wing could have a pylon with a maximum height of 2 to 4 inches on any given model. A typical 1/2A model pylon will seldom exceed 3 inches in height, with 2 inches being close to average (measured from fuselage top to top of pylon).

Most models which are not equipped with auto surfaces need some kind of down thrust effect in order to offset the lifting and drag forces of the wing. Some models, such as George Fuller's "Dixielander," beat excessive downthrust by balancing the model at 100% and flying with little incidence. Others use a large lifting stab to balance out this power. Others spiral climb, so that the model makes a series of spirals during the climb instead of looping. Normally, the higher the pylon, the more down-thrust effect is needed to control the looping tendency.

A pylon should be made as light as possible, but structurally sound to resist twisting. Normally, on a 1/2A model, this means vertical grain 3/16 sheet balsa . . . medium density (10 lb. stock or so), or a built-up pylon using a 1/8 strip balsa core, covered on either side with 1/16 vertical-grain light balsa.

Pylon shape: Makes not a whit of difference. Someone said that pylon and fin shapes mirror the times; straight and angular during hard times . . . fanciful and curvy during good times. There are quite a few straight and angular ones around these days.

Nose to Tail . . . Takes but a Moment: Moment arms! Was ist das? Imagine a lever . . . got it? Good! Put a fulcrum at one point somewhere along its length.

Imagine the C.G. (Center of Gravity or balance point) of the wing at that fulcrum. Put an engine at the short end and a stab at the other. The distance from the C.G. to the prop is the nose moment arm (NMA). The distance from the C.G. to the stab center of pressure (high point, nominally), or sometimes the stab leading edge, is the tail moment arm (TMA). The shorter the NMA, measured in percent of wing span, the better the stall recovery characteristics of the model, because for the majority of a flight, the engine provides no lift or anything else except dead weight and drag. But when it is running, too short an NMA will produce some odd thrust lines in order to provide an acceptable climb.

Example: A local modeler built a very short NMA version of the "Ephemeris" (high thrust) for FAI power. The NMA was such that the prop was around 1 inch in front of the wing leading edge. In order to get an adequate climb angle, upthrust to the tune of 10 degrees had to be added in order to get near a 60 degree climb. Acceptable, but not as desirable as a steeper angle would have been. However, the stall recovery of the model was outstanding. This short NMA was simply too short.

What would be a good percent for NMA? Measuring from the C.G. of the wing to the prop blade line, a good average to strive for is 12 to 15% of the wing span. This would translate into around a minimum of 6 inches to a maximum of 8 inches for the average 1/2A model. The longer the NMA, the more critical will be the power adjustments, the shorter the NMA, the better will be the glide and stall recovery capacities.

TMA . . . the distance from the C.G. to the stab. The longer it gets, the better the glide, the poorer the transition. You will seldom find a model with a TMA of under 30% of wing span. Shorter TMA's generally are credited with better "dynamic" soaring capabilities because they turn more easily, thus, according to this reasoning, they are more able to center themselves in thermals. In dead or non-thermal air, the long TMA will outglide the short TMA.

A typical TMA for 1/2A models will be in the range of a minimum of 12 and a maximum of 20 inches. Somewhere between these extremes will lie the average.

More next month. ●

**Hannan . . . . . Continued from page 49**

then an extremely non-linear curve of reward vs. achievement. I mean, beyond a certain point, it takes a lot of achievement to get much in the way of points. Nothing new here. But some of those who design rules seem to have other things in mind.

"I object to having rules require or ban certain materials. I have condenser

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paper that is heavier than some of my tissue. I can make microfilm that is heavier than paper. If it suits my fancy, why should I be penalized for using them. Suppose films of any type are banned, and condenser paper is banned or heavily penalized. Or suppose that Japanese tissue is specifically required. Then, from the outbacks of Japan, comes a new tissue, made from the pubic hair of virgin Japanese beetles. It is tough, not too porous, and best of all, it weighs less than the lightest condenser paper. And it is easy to work with. Great, let's all use it! I forgot to mention that it costs \$100 per square foot. So \$100 becomes the price of a first

place trophy, all other things being equal. (*Shades of pylon racing engines! wcn*).

"Somehow, the ghost ships should be penalized, but penalizing the use of condenser paper isn't the way to do it. A weight rule, it seems to me, would do it. Not so much weight per 100 sq. inches, because that is too difficult to compute, and the judges have their hands full already. Just a flat rule that, "The model must weigh at least 10 grams", or whatever the right number is. That would still give an advantage to the wide-wingers, but I don't see a way around that, short of a weight-per-unit area rule, which is difficult to administer.

CONGRATULATIONS to Bill Stroman  
whose Astro 020 powered  
Gotha Taube (shown) was 1st  
in Free Flight Scale  
at the Flightmasters Annual  
ALL-ELECTRIC MEET.



### Results—Flightmasters All-Electric

#### FF Scale

1. Bill Stroman . . . Gotha Taube . . . Astro 020
2. Larry Moss . . . Longster Parasol . . . Astro 020

#### FF Endurance

1. Gene Wallock . . . Ranger . . . Astro 020
2. Mike Bernhardt . . . Zipper . . . Astro 020
3. Tony Naccarrato . . . Starduster 350 . . . Astro 05

#### Control Line

1. Tony Naccarrato . Goldberg Combat . Astro 020
3. Lonnie Cope . . . Farman . . . Astro 020

#### RC Powered Sailplane

1. Bob Imrisek . . . Electra Glide . . . Astro 05
2. Tim Renaud . . . Square Soar . . . Astro 05
3. Lee Renaud . . . Square Soar . . . Astro 05

#### RC Aerobatics

1. Bob Imrisek . . . Electra Twin . . . Twin Astro 25
2. Keith Shaw . . . Electra-Fli . . . Astro 05
3. Bob Boucher . . . Electra Twin . . . Twin Astro 25

#### RC Scale

1. Annie Mae Naccarrato . Aeronca C3 . Astro 15
2. Bob Boucher . . . P-68 Victor . . . Twin Astro 05

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THE PASSING PARADE

Two more aviation notables have left us. Herr Carl Clemens Bucker, originator of the famous Jungmann and Jungmeister aerobatic biplanes, and "Dapper Dan" Burnett, the man who applied the "whirlies" to the "Spirit of St. Louis" cowling, and more recently supervisor of Jenny restoration for the San Diego Aerospace Museum. The message is clear for us all . . . appreciate each other while we may. We are as fragile as the aircraft we build and fly. (*We are proud to have met Dan Burnett during the final landing of the Rich's trans-continental R/C flight. wcn.*)

#### R/C IS FOR THE BIRDS

At least at the San Diego Wild Animal Park. Seems a new attraction has been added, which features trained birds. Conducted by one Steve Martin and Kathy, his trim young blond assistant, the act includes a variety of species. A cockatoo and a mynah bird named "Howard" demonstrate remarkable talents by talking, while a raven does a precision balloon-bust routine, then deposits the debris in a near-by trash container. A great horned owl swoops over the audience in full flight, displaying the uncanny silence of their barbless feathered wings.

Highlight of the show, however, is the ascension of two red-tailed hawks in a helium dirigible, itself quite a spectacle. Measuring some 37 feet in length and 12 feet in diameter, the captive balloon soars to some 500 feet, and can be seen for miles. The birds are enclosed in a cupola beneath the gas bag, in individual compartments. Trap-doors beneath each compartment are intended to release each bird at the proper moment. I say intended, as the trap-door releases are R/C actuated from the ground, and to date, their dependability has left something to be desired . . . very embarrassing to the MC, to say the least, (*Probably can be credited to the "Garbage Band" CBers. wcn.*) But when performing properly, upon an electronic command from lovely Kathy, one bird emerges and gives a fine demonstration of soaring, effortlessly around the balloon. After a few circuits, a small chunk of food is casually tossed by a trainer, and the bird retracts his wings and plummets like a stone after the quarry, whipping his wings to a parachute-like opening at the last possible moment to retard his speed, and land on Steve Martin's arm.

The second hawk, a younger one, skips the soaring phase, and dives ("stoops" in bird parlance) directly for the ground at an alarming rate of speed, estimated to approach 100 mph, flaring at the last moment to a landing. We have seen this show three times, and still want to see it again . . . it's that impressive. Anyone passing through the vicinity of San Diego should certainly

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"Anyhow, I don't think your heady philosophy is inimical (ok, look it up!) with properly written rules."

#### BHP PUBLICATIONS

Jack Buehler, Bob Hawk, and Bill Pepin are the new owners of Modernistic Models, founded by the late Hal Swanson. A stamped return addressed envelope will bring you a list of their plan offerings, and a catalog is planned for the near future, price to be announced. P.O. Box 6974, Albuquerque, New

Mexico, 87107.

#### NOT JUST ANOTHER PRETTY FACE

Rina Messenger, 20-year old winner of the 1976 Miss Universe pageant, is a qualified glider pilot, and is studying to be an aerodynamicist.

#### WINDER MODIFICATION

The Kyosho rubber model winder, distributed in this country by Sterling, features a built-in ratchet, which has certain advantages, but prohibits winding in the opposite direction. Bill Krecek has evolved a simple modification for a clutch over-ride, as shown in our illustration. Useful for pusher models and back-winding if required, the gadget may be constructed in a short time at

include a visit to this remarkable facility in their itinerary.

#### PARTING SHOT

(Dedicated to Howard McLeod)

Then there was the 3-view draftsman who rendered a McDonnell F-4C in "phantom lines" . . . Oh well.

**SOLO** . . . . . *Continued from page 15*  
exception of the radio installation.

Install the aileron servo and linkage in the wing. Use short 1/16 diameter threaded rods for the aileron push rods. Place the radio components in the fuselage and put the wing on the model. Suspend the model from the C.G. (A loop of string under the wing hold-down rubber bands works well.) If the plane hangs nose down, move the radio components towards the rear of the model. If it hangs nose high, move the radio components forward.

When the model balances correctly, mark the position of the components in the fuselage. Glue in the servo tray mounting rails. Space them to fit your equipment. Mount the servos as low as possible in the fuselage so they won't interfere with the aileron servo and linkage. (A Two-Plus-One servo tray works best. Arrange servos as shown in photo). Cut the nyrod and pushrod ends to fit the servo location. Hook everything up and check for smooth operation. If anything binds, find out why and correct it. Set up your controls for no more than 15° movement either side of neutral on any of the control surfaces. Optimum control surface travel for your airplane and style of flying must be determined by experiment during test flying.

#### FLYING

If you are a beginner, enlist the help of an experienced R/C pilot to help you test fly and trim your Solo. Ask him for help in flight training too.

The Solo makes a good basic trainer with a 20-30 engine and minimal control surface travel. With a 30-40 engine and increased control travel, it's an excellent aerobatic trainer.

For those of you who like the Solo, but do not like to scratch-build from plans, a Solo kit will be available from Solution Aeromodel Co., 6112 McKinney N.E., Albuquerque, New Mexico, 87109.

#### Mini America . . . *Continued from page 59*

called for is simply light-weight 1/32 sheet sanded down to 1/64 (or so). Choose light-weight wood for all parts, including longerons.

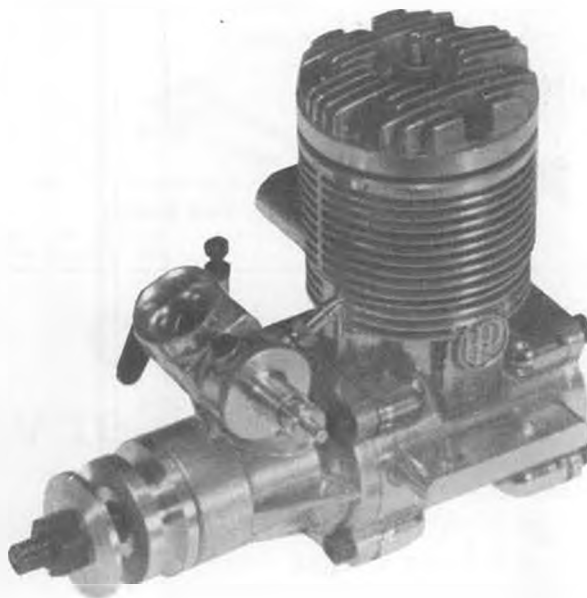
Cover the model with lightweight tissue, dyed to color. The original used superfine tissue, which is not generally available any longer. Peck-Polymers and Micro-X Indoor Supplies do carry some very good lightweight tissue, however.

The wing construction is conven-



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tional. Cut out ribs, leading edges, trailing edges, etc. and glue into place. I used Hot Stuff exclusively. You will need to sand the tip ribs to shape. Maintain the same high point on the rib and fair them down to a pleasing curve. Sand only the top camber. The leading edge sheeting covers both the top and bottom of the wing leading edge. It is glued into place using Hot-Stuff. Wash in the left wing tip when you put in the dihedral angle. It should be raised about 1/8 inch at the leading edge. Add the wing spar last.

The fin and stab construction is conventional also. The fin and stab have no airfoil, so the "ribs" are simply 1/32 x 1/16 strips glued in place. The stab

sheeting on the leading edge is also on the top and bottom. Hot-Stuff in place and sand the structure to shape. The fin and stab ribs must be sanded flush, so that no bumps or humps appear when covered.

Use light-weight wet-or-dry paper (320 grit), used dry, to sand the wing, fin, and stab.

Construct the fuselage next. It is typical in construction. Build one side of the model directly over the plans. When completed, build the other side directly over the first (to minimize differences). Place Saran Wrap or equivalent over the first side before building the second. Place the two fuselage sides over the top view of the fuselage shown

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# JOHN POND

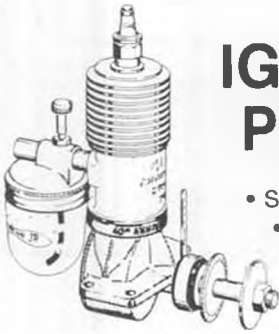
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on the plans and glue the spacers in place. Maintain a balanced curve to the fuselage so that it will be lined up with no funny bulges or skews along the way. When the fuselage framework is finished, cut two sheets of 1/64 balsa to shape and cover the entire front of the fuselage where indicated. Glue directly over the framework using Hot-Stuff. Wrap the 1/64 sheet over the front of the fuselage on top of bulk-

heads A, and over the 1/16 sheet engine compartment cheeks. Cover the bottom of the fuselage back to the rear landing gear location with 1/32 sheet. Glue a piece of hard 1/8 balsa sheet to the nose area. Install the 1/16 sheet platform between front bulkhead A and the 1/8 nose block. Sand the fuselage thoroughly.

**Dying the tissue:** Build a frame from 1/4 square balsa or spruce. The

frame should be large enough to cover the complete piece of tissue you plan to dye. Tape the tissue to the frame, and using a "Windex" type bottle, mix up some food color and water in the color you plan to use. The original color scheme of the Miss America was followed. Mix the food color so that the color is very dark. Spray the tissue on the frame. Set aside to dry. You may need to spray it again to get a deep color. The paper will shrink on the frame and will not cause undue warpage on your model if this procedure is followed.

Cover the wing and the stab with red tissue, using the thinned-out white glue method suggested by Walt Mooney. Adhere the tissue only at the leading and trailing edges, tips and dihedral breaks. Cover the complete fin with blue tissue. Cover the complete fuselage with blue tissue. When all parts are covered, put some water in the steam iron and get it steaming. Pass the covered parts over the steam so that the tissue just begins to look slack. Set aside to dry. When dry, glue the fin in place with no offset... use Hot-Stuff.

Cut a slot in the fuselage tissue behind the motor pot where indicated on the plan. Slide the stab in place. Be sure that the incidence angle shown on the plan is followed when gluing the stab in place. Use Hot Stuff, again.

Install all 1/16 diameter aluminum tubing. The wing hold-downs are adhered in place using Hot Stuff. The rubber peg at the rear of the fuselage should be a snug fit, but should be removable.

**Landing gear:** The front landing gear is bent to shape from 1/32 music wire. It is the only piece that has a mounting leg for the wheels. The spreader bar is also bent to shape using round-nose pliers to get the neat coil. The rear gear is bent to shape next. Now, here comes the fun part:

1. Using Hot Stuff, glue the front landing gear wire in place to the bottom of the fuselage where indicated on the plan.

2. Next, glue the rear wire in place where indicated. Be certain that the two pieces come together at the wheel leg. Hot stuff this joint.

3. Install the spreader bar, using Hot Stuff.

Although it doesn't appear necessary, if you are squeamish about the Hot Stuff joints on the wire, you may very lightly solder this joint. The wheels are held in place by punching out a 1/8 inch diameter piece of celluloid and poking a pin hole through the middle, then sliding this onto the wire leg. Hot Stuff it in place. Slide the Williams Brothers Wheel in place and put another 1/8 inch celluloid disk in place. Hot Stuff, carefully, to keep from locking the wheel to the wire leg. The tail wheel is just a piece of balsa sheet cut to a circle and glued to a piece of 1/32 wire which is Hot

Stuffed to the fuselage rear.

Now, all that remains is that neat "Miss America" emblem and prop assembly.

First the emblem.

Using the finest light-weight white tissue you can find, tape it directly over the drawing of the emblem. Using colored pens, outline the entire emblem in black ink — very fine lines are needed. Follow the color scheme listed on the plans and fill in the remaining colors.

Remove the tissue from the drawing and make a second copy just as the first. Cut, very carefully, around the outline of the emblem, leaving about 1/8 inch of white tissue around the perimeter. Place the emblem on the fuselage of the model and using thinned-down Sig Lite-Cote dope, very gently brush over the entire emblem . . . once. The emblem will adhere nicely and you won't be able to see the white border unless you look very closely.

Apply the black tissue trim strip in the same manner as you did the emblem.

Now, the prop assembly.

The original model used a carved balsa prop. The prop blank is shown. No part of the blade should be over 1/32 thick, except the hub area. You may want to use a commercial plastic prop, and if so, be sure it is at least 5 inches in diameter. Performance with a plastic prop will not be as good, but it can do the job, if you have bad feelings about carving your own.

A Peck-Polymers nose button can be used, or you may do what I did. I made a nose button from a piece of 1/8 inch balsa, using a piece of 1/64 plywood to cover the front of the "engine compartment." See sketch.

Although it isn't needed in the rules, I felt that it would add a touch of realism if I constructed a "model" engine. So, using a Williams Brothers cylinder, I made up a scale Brown Junior complete with spark plug. The whole thing is very easy, and does add to the appearance, I believe. The spark plug is made up of a short piece of 1/16 diameter aluminum tubing glued (Hot Stuff, of course) into a 1/8 long piece of 3/32 diameter aluminum tubing. The top of the plug is a small straight pin head. The 1/16 tubing is painted white and the large tubing and the pin head are painted black. The engine compartment, engine, and nose plug are painted dull black, with silver added for effect. The windshield is glued into place using Hot Stuff. Glue the front (curved) piece in first. A pattern for this piece is provided. Individual models will differ slightly, so use the pattern provided as a starting point. The side windows are glued on in one piece.

Flying: Balance the model where indicated . . . no further back! Add weight to the nose if necessary to get proper balance. Install the 3/32 rubber

# STUFF? WHAT'S STUFF?

Hobbypoxy STUFF is the quickest, easiest to use grain filler you can buy, that's what STUFF is. We originally made it to be used as a dent and nick filler, but pretty soon modelers began to thin it to brushing consistency for use as a grain filler too. And they were happy to discover that it takes only one or two coats to fill balsa grain, that it dries in minutes, and that it sands easier than talc-dope.

Okay, you say, if STUFF is such a terrific filler, how come we also make Hobbypoxy FILLER? Good question. FILLER was intended to be a filler when STUFF was a nick fixer, but now that STUFF is a filler, FILLER has become *another* filler. What's the difference? FILLER is harder (but just as easy to sand), which makes it a better base for a super finish that has to withstand rough treatment and lots of use, like on a contest ship. You might say that STUFF is great for most purposes but FILLER is best for that special model.

Now wait a minute. If STUFF is a filler and FILLER is a filler, then what's Hobbypoxy UNDERCOATER WHITE? It's a filler too, but unlike the other two, HUW is a true two-part epoxy material. Which means that it cures without shrinking, and adheres to just about everything. UNDERCOATER WHITE can be used on wood, of course, but it's super terrific when you use it on fiberglass and other molded plastic structures. It'll fill pinholes and smooth out cloth texture better than any other product, and it won't chip, crack, craze or become brittle, even on flexible plastic parts.

Naturally, all three products are perfect bases for Hobbypoxy enamels. But even if, for some obscure reason, you prefer another type of topcoat, the best thing to put under it is still Hobbypoxy STUFF . . . or FILLER . . . or UNDERCOATER WHITE.

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motor and wind in about 350 to 400 turns. Place the model on the gym floor and release. It should taxi and begin to rise off the ground. If it stalls, add left thrust (3 degrees was needed on the original). Wind again and launch again. The model should turn to the left under power and climb steadily in about 40 ft. circles. If it stalls under power, either increase the power or shim up the trailing edge of the wing to get a good pattern.

I hope you enjoy flying your Old Timer Scale Rubber Powered Miss America as well as I enjoy mine.

Now, let's see . . . there are some other neat Old Timers that would make Indoor Scale subjects . . . how about

the Red Zephyr or the Flying Quaker . . . hmmm!

**C-119G . . . . . Continued from page 41**

bulbs. There is a twelve-position stepper switch that is used to select the operations to be used.

The ground control box has a horizontal plate with insulated bellcranks mounted above and below. Flight control is a handle on the right side of the box that operates the top bellcrank. This handle has a trigger switch that applies electric power to the function selected by the stepper switch. The engine controls are operated by a lever on the left side of the box that connects with the lower bellcrank. There is a rotary switch



# BRUTE POWER!

by  
**ops**

## URSUS .60 R/C

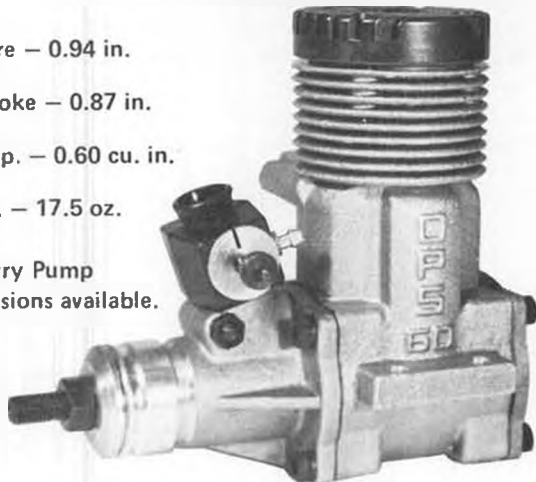
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on the box that operates the stepper switch, as well as an emergency landing gear down switch, a light switch, a voltage change switch, and a function reverse switch for emergency use. All of the electric power is supplied from a special rechargeable battery pack. The control box is connected to a special nylon web harness, worn by the pilot, which is designed to distribute the line pull across his shoulders as he leans back while holding the model in flight. The plane weighs thirty-two pounds, which is now above the weight limit for multi-engined scale models.

When this model was planned and built there was no weight limit. I have

made an extensive study, with the aid of a computer, concerning line pull at speeds ranging from 15-190 mph, with model weights from a 1/2 to 30 lbs., and all standard line lengths. If this model were to fly at 75 mph, the pull for 70 foot lines would be 120 pounds. With this in mind, I have made provision for an assistant to help hold the model, or more correctly, to hold the pilot by means of extra nylon-web straps on the back of the harness. I feel that at all times, my model C-119G is safe to fly.

A confession as to flight. I have entered only one contest to date and arrived "cold", in that I had never

flown the model. The Packet did get off once briefly, but not enough to qualify. Pilot error and field conditions did me in. I was nervous and forgot to extend the flaps for take-off. I think the engines weren't wide open, and lastly I was attempting to take off from a 60 foot paved control line circle with 70 foot lines. The right-hand main landing gear struck the edge of the circle, grounding me for the day. Since then, I have repaired the damage but have not had the opportunity to fly the model.

My normal flight plan for a scale contest would be: Start engines (with an electric starter, both can be started in thirty seconds). On roll-out, extend flaps. Take off and retract landing gear. When gear is fully retracted, flaps retract. Extend trailing antenna. Retract trailing antenna. Open paratainer drop doors (on the C-119, these are at the front of the cargo hold and function in the same manner as bomb bay doors). Operate monorail delivery system and drop twenty paratainer or cargo chutes. Pull the chute static lines back into the model. Close drop doors. Lower flaps. When the flaps are fully extended, the landing gear lowers. Throttle back the engines and land. Bring the plane to a stop, make taxi lap and stop again. Cut right engine. Cut left engine. Sound warning horn. "Pop" life raft.

The final area of detailing a scale model is in the painting, and it is here that many a fine model falls short. I have several good color photos of the C-119G aircraft I duplicated, along with detailed instructions concerning painting several areas listed in the Illustrated Maintenance Manual. The aluminum skin of the Model was primed with Rustoleum Zinc Chromate Primer from an aerosol spray can. I then used Rustoleum Silver, Gloss White and Flat Black for large surface areas. The Air Force stars and bars are Pactra 'Namel, while the large letters USAF were Gloss Black Rustoleum. The serial numbers on the fins and nose were cut from black vinyl Contact. The great profusion of instruction stencils such as: "No Step," "Danger," "Cut Here For Rescue," "Ground Here," "Suitable For Aromatic Fuel," etc., were sprayed through miniature stencils made from .002 steel shim stock. These stencils were etched, using Kodak photo-resist, type KMER and dilute nitric acid.

A project such as this is perhaps one-of-a-kind for a modeler. It represents my greatest effort to date. I will continue to build in the scale area . . . perhaps not bigger but hopefully better.

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Victory . . . . . Continued from page 25

D. Landing (35 points maximum)

1. Approach
2. Attitude as to landing position relative to restricted landing area of field.

Total possible points . . . 100.

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A maximum of 45 seconds engine run was allowed, on two official flights. And did you notice the landing points? Duration is of no importance, so the idea is to make your ship "stick around." (Hmmm . . . wonder what we did with that battery-driven cam steering device from the Mattel bird, or that pre-programmed Stutz Bearcat?)

### BACK TO "WINGED VICTORY"

There probably weren't too many duplications of "WV" (Is that a "Bug" with the engine in front?) back in the early days, because Joe's construction techniques were quite beyond the average builder. The cowl alone was a masterpiece of spun and formed sheet metal. However, with today's materials, especially fiberglass and epoxy glue, the model should be a lot easier to recreate now than then. And we gotta contradict our own earlier comments about the precision event . . . this beauty is a super-natural for R/C! According to our loose calculations, K&B's new .21 (3.5 cc) engine is a perfect powerplant, based on SAM's 225 sq. in. area-per-.10 cu. in. displacement rule.

Incidentally, Joe now lives in the San Diego area of Southern California, and in case some of the photos with this article look a little familiar to our genuine old time modeler readers . . . they should! We informed Joe of our intentions of republishing the "Winged

Victory", and lo and behold, he came up with the original negatives of the photos used in the original M.A.N. article. How about that!

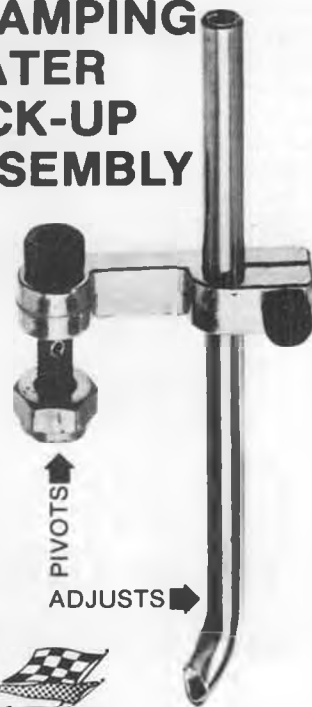
### Sailing . . . . . Continued from page 37

I would appreciate feed-back of how she performs against the top American designs, as this is the only way for development to continue.

"In conclusion, there is one point that I wish to emphasize which has been said many times before. The design of the hull and rig is only a small part of what goes to make a successful yacht. Good sails are critical, and if everything from cut down to setting is not 100% correct, it is the same as trying to race a V-8 engine power boat which is firing on only six cylinders. But most important is the chap with the transmitter. Even the most highly-tuned boat will perform like a log in certain hands. There are no short cuts to the trophy circle, so watch and talk with the top skippers and apply what you learn to your own sailing. To those of you who build Sonic Boom II, I wish you every success."

It has been most interesting to watch the general trend in 50/800's. As far as I can tell, Sonic Boom II is right in the middle of the displacement range, which is proving to be the best for all around performance. Earlier designs were hoping

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to exploit the benefits of acceleration, and a good example of that is the original Yankee which weighed in at 13.5 lbs on her designed lines. Experiments with her in Florida showed that an extra pound of lead or so did much to up her momentum and help her carry through her tacks in rougher water. At the same time, the Yankee's designer, Chet Purdy, was hard at work on the concept and has produced Yankee II. She is fuller forward than her progenitor, to prevent downwind nosediving, and she has had her underbody enlarged to produce a final displacement in the 16.5 to 17 pound range. This is certainly a parallel design evolution to Sonic Boom II. At the same time, we have seen Chris Dicks and Roger Stollery start to experiment with the "aircraft carrier" type of bow form. I think I'll call it a Saratoga bow for want of an easy name.

Other attacks on the general hull form have been attempts to reduce the wetted surface of the Yankee hull. John

Huson, of Leisure Products, took a production Yankee off the line and removed a symmetrical wedge from the centerline, which had no width at the bow and widened to almost 3 inches at the transom. By so doing, he reduced the Yankee's displacement even more, and is now sailing an 11.5 pound boat. Sticking with a very low aspect rig, much like the Soling's, the boat has shown extreme power on heavy air reaches. But it has suffered with an extremely loose keelbulb arrangement, which is so floppy that I'm afraid the boat will eventually be protested for having movable ballast!

Having just taken delivery of some new radio gear with 7 channels to play with, I returned to thoughts of more adjustability on the boats I sail.

At the top of the list was a vang arrangement to be able to control the amount of twist in the mainsail while reaching and running. Current designs are generally too complicated, utilizing

block and tackle arrangements to give the mechanical advantage needed for firm vang tension. But from the full-sized racing classes comes the lever vang. The arrangement shown in the figure can be adopted to either an R/C controllable one by leading line 'A' down through the deck to a hi-power servo, or else put a turnbuckle in 'A' and you can probably drop your boom an inch or so, reduce your heeling and gain some end plate effect.

The line indicated at 'B' can just be a rubber band, as it is doing nothing but keeping the lever plate in the plane of the mast and boom. I would expect that a brass or aluminum lever plate would be good, though hefty bakelite might work too. Make sure that stay wire is used wherever possible, as sheet line would have a tendency to fray under such tension. And use a trimmable servo so that the transmitter control is an indication of how much vang tension you have set.

## BATTEN YOUR HATCH

Of all the individual sub-systems on our boats, the hatch seems to be one of the most prone to malfunction. This may be due to the hatch being constructed as an afterthought, instead of being built in as an integral part of the hull/deck. In order of importance, a good hatch should be:

1. Watertight
2. Easy to open
3. Snag proof
4. Transparent
5. Water proof
6. Light weight

The first requirement is obvious, yet 5 out of every 10 hatches that I see leak like sieves. The second requirement can be obviated somewhat if you contrive a method of turning the electronics on and off without having to enter the interior of the boat. A waterproof toggle which fits through the deck in an unobtrusive place like the base of the mast is available from Harris Engineering, 7628 Dunston St., Springfield, VA 22151. I have also seen a magnetic switching arrangement that was demonstrated by Vince Serio of Sail Engineering, P.O. Box 8439, Richmond, VA 23226, at the Toledo Show. Such extra efforts are well worth the trouble. I have been using one of the Harris switches and am well pleased. It also helps speed up regattas, as you are able to clear your frequency for a partner as soon as you get your hand on the boat.

A snag-proof hatch is an absolute must. All edges must be rounded, with no cracks for a sheet to wriggle under. A good way to handle this is to choose a hatch configuration that is flush with the deck. Figure 1. shows some variations. The tape seals are excellent if you do not have to continually open and shut them. I tape my boat twice; once just before the event starts, and a second time at lunch when I put in all new

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batteries. I make sure that the new tape goes down on an absolutely dry deck, and keep a handful of towels for just that purpose. While the tape may be ugly, it is light, easily removable, and will not need to be on the boat when it is being viewed close-up on display. The mechanical simplicity is a great benefit.

I prefer a transparent cover just for the ease with which one may check his bilges, and see that batteries haven't shifted. It is one more way to eliminate a continual opening of the boat between heats.

Waterproof seems to be a foregone conclusion, yet many skippers will go the tape route, and inadvertently use masking tape of the variety which soaks up water, loses its adhesive ability, and ceases to act as a barrier to the onrushing waves.

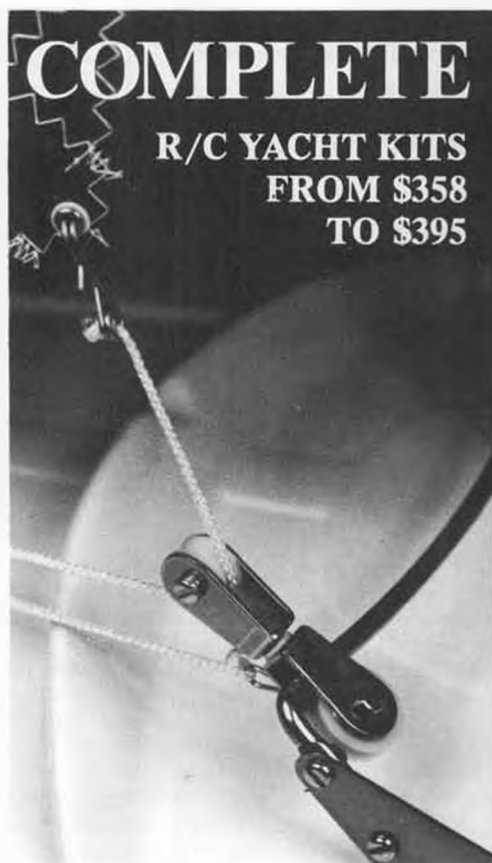
A lightweight hatch cover is a continuation of the practice of keeping as much weight in the keel of a boat as possible in order that she is able to carry sail and stay stiff. Lightweight does not mean flimsy, nor does it mean makeshift. A Saran-Wrap cover will be the inevitable target of Mr. Novice-On-Port-Tack, much to your dismay.

If you can afford the weight, the Flush Shoe-Box is a good choice. It will often require only a rubber-band tie down if you make a good fit while installing it. If you are putting a hatch on a boat which is already decked, the Yankee Shoe-Box, already described in these pages, is a variation on the same theme (Fig. 2). Some builders have incorporated a foam gasket at points A and/or B in these arrangements, which the rubber band pulls the hatch cover into.

One can also investigate the round plastic access hole covers that are marketed by the yachting supply stores for racing dinghys. These have a round screw top that comes off with a twist. They come in a series of diameters and a selection of colors, from such companies as Holt Allen.

On a couple of Canadian boats, I saw a configuration which can only be described as the Sliding Slab. The actual cover slides into a slot which runs forward and across the front of the hatch coaming. I'm not sure exactly how the after end was sealed, but it might have been a lift-off rear coaming, or a gasket seal that was compressed by the slab. Its watertight integrity depended on the care and clearance allowed in the slot-to-slab joint.

A popular general category of hatch cover is the Fitted Pop-Top. The SOLING is a typical example of this. A sheet ABS or acrylic cover is vacuum molded over a plug which matches the coaming raised in the deck of the boat. Depending on where the sheets run, I have seen snags on this type if they are not carefully pulled down tightly against the deck.



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Chuck Black used to build decks with the coaming, then use the coaming itself as a plug for a laminated pop-top. Common sense dictates that one make a spare cover if this method is used, and that the hatch cover itself be made sturdy but light to conform with our other requirements for a good hatch.

I'm sure there are others but my plea for your suggestions fell upon deaf ears, with Chuck the only one to respond. To him go my thanks for his time and effort stolen from an otherwise unbelievably busy schedule.

Meanwhile, at the other end of the mast, J.G. Products, 8030 Fordham Rd., Los Angeles, California 90045, is offering a selection of silicone bronze

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Speaking of the radial jib fitting, I recently made a modification to mine which eliminated a source of potential misadjustment. See Fig. 5. To prevent the jib club swivel pin from moving upwards when reaching, I made a 1/8 thick brass washer and put it in the position shown. Now the swivel pin does not change position in a vertical direction whether under the downward action of the jib sheet when closehauled, or the upward pull of the sail when reaching. Good lubrication is a must, as well as perfect alignment, as discussed earlier, between swivel pin and jib stay. ●

### Peanut . . . . . Continued from page 51

Of course, the stab must be built as light as possible. Its central part is not tissue.

The fuselage is built on the top view (side and cross pieces of 1/16 sq.) with the help of the formers B and C, then of the pattern D. The rear of the fuselage (after C) will be finished only after the location of the stab.

The formers 1, 2, 3, 4 are balsa covered (1/32 sanded). The cockpit is shaped from 1/4 light balsa. A thin sheet is fitted between A and B. The former A is glued after the fuselage has been removed from the board. The parts of the nose (hard balsa) and of the cowling are sanded to shape. The diagonal riggings are made from 1/64 sq.

The undercarriage is very complicated. This is of course, a particularity of these

old planes which had sometimes to land in acrobatic conditions. So, many struts were needed and, at the same time, two "skis", which prevented the spectacular "cheval de bois".

I saw that Bill Hannan used spaghetti to figure the struts. Me, good Latin, I prefer the spaghetti with tomato sauce. My struts are made with straw (provided by high dry herb . . . but have yet high dry herb?). All the struts are fixed with short axles of piano wire (1/64 dia.) cemented into. Only the struts H are entirely wired (.020). The wheels are Hungerford, of course.

The cabane struts are made in the same way. Silk thread riggings are fixed on it. The tail skid is formed from refined and carved bamboo. Important: As for the other pieces made from it, the varnished face of the bamboo is not sanded.

The rudder is formed around the requisite pattern. The fin is a simple V.

Its leading edge is a thin straw. Rudder and fin are glued once the stab is located.

Engine: It is a 40 HP water-cooled Labor Aviation. It is made from balsa sheets and . . . straw (exhausts, valves and pipes). It's not a plane, it's a barn! The crankcase is bright metallic grey (oily aspect), the pipes are copper, the exhausts rusted and the valves, chrome.

Decoration: The balsa sheet parts of the nose, the cockpit and the square parts of the skis have a mahogany color (obtained with a marker and varnish). The nose and the cowling are matt aluminum. The ancient aeroplanes were generally covered with varnished fabric. The covering is made from yellow or white lightly tinted and glossy doped Japan paper. One clear coat is sufficient.

Flight: Because of the design of the wings and the efficacy of the stabilizer, the C.G. location is situated at 40-45% of the chord. The result is a stretch and

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rapid flight, advantageous outdoors, but the spiral adjustment is not easy. For indoor flights, the C.G. location will be nearer the leading edge, and the incidence angle will be increased. So, once again, a light rear part is necessary. The propeller of my model is a 5 inch Peck shortened to 4-3/8. It turns quickly. The rubber is a loop of 2 x 1 Pirelli winded from 800 to 1,000 turns. A balsa propeller with large blades is preferable for indoor.

Last precision: Giscard didn't come to the U.S.A. with Concorde but with an Hironnelle. You don't believe me? Look at the photographs!

Good flights. ●

**Rocketry . . . Continued from page 29**

got a perfect safety record, nobody's had to worry about it yet.

Here are some timely tips to avoid having hassles with your engines in the first place. First, treat rocket engines like the precision instruments they are. A drop to a concrete floor can cause a hidden crack in the propellant grain of an engine. When the propellant burns as far as the crack, the chamber pressure of the motor increases drastically, and blows a flaming wad of propellant out of the top of your rocket.

Next, give your engines a visual inspection soon after you buy them. Look for wrinkles or cracks in the paper casing near the nozzle end; if there are any at the ejection end, they are not likely to be important. Check the nozzle itself; if there is a large crack or chunk missing from the throat of the nozzle, the engine could perform badly. Finally, take a good look at the cap over the ejection charge. Ejection charges must be loose powder rather than the solid grain of the propellant, so they must be held in place with a paper or compressed clay cap. The paper cap is far superior,

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since the clay can crumble away after a period of time. See that the cap isn't loose, and check the bottom of the bag or box that the engines came from; if there's powder in the box, take a hard look at the ejection cap.

Store rocket engines in a cool, dry place. If rocket engines are left on a car dash on a sunny day, they may heat up enough to expand the casing, causing it to pull away from the propellant grain. This condition invariably results in what the British, with precision, call "catastrophic self-disassembly." Note that heat inside a car will not ignite the engine, or cause visible signs of damage, while ruining the engine. Moisture can also swell casings. Keep your engines safe from such hazards as pets, small relatives, and chain smokers!

In regard to the fire hazard of stored engines, you'll be pleased to hear that it is very, very small. Unless you actually butt out your cigarette down the nozzle, there is almost no chance of the engine going off accidentally. In tests for the government, rocket engines have had all

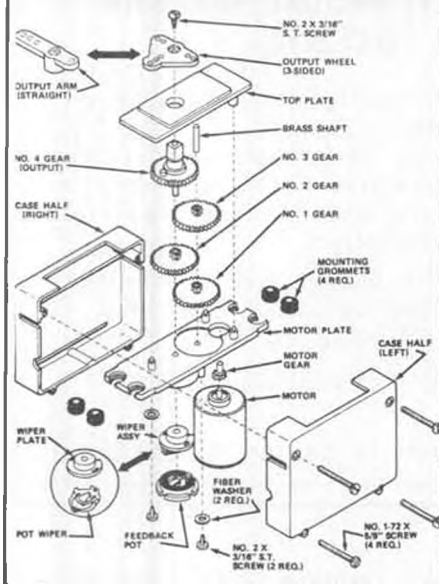
manner of obscene things done to them, like being crunched under weights, shot with shotguns, chucked into bonfires, and mailed by Parcel Post, without igniting.

Now that we know how engines can't be ignited when you don't want them to, let's discuss how to get them going when you do. The "standard" igniter is based on nichrome heater wire. This can simply be shoved up the nozzle of the engine until it touches the propellant, and secured in place with tape. When power comes through to the pad, the wire heats up and ignites the engine . . .

IF it's really touching the propellant, and IF it doesn't burn through and cut the circuit before heating the propellant.

Actually, bare wire is about 50% reliable. Estes improved on the system by machining a thin place in the center of the wire which will heat hotter, and coating it with a flammable material which also serves as insulation. This is packaged with all Estes engines in strips of 3. Once again, however, if it isn't in very close contact with the propellant,

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it can "burnout" without getting anything going but your hopes.

Centuri added a good bit to igniter technology with the "Sure Shot" igniter, which is a piece of wire and a short length of fuse. Wrap the wire once around the fuse midway along its length, fold the fuse in half, and stuff it in the nozzle. The nichrome ignites the fuse, and the fuse ignites the propellant. It's a trick to fabricate them, but they are very reliable.

In the meantime, FSI has always used a unique igniter called "Wire Wick." It's similar to Centuri's, but much simpler; it's simply a piece of wick that is braided with nichrome wire. Insert it into the engine with about a 1/2 inch protruding from the nozzle, and hook up your clips along the exposed wick in such a way that the wire braid completes the circuit between the clips. Power heats up the wire, and you're underway. About the only thing that can keep the engine from firing is tripping over the

launcher wires and dragging the wick out of the engine.

Estes and FSI both sell higher-efficiency igniters. The Estes "Solar" igniter is designed exclusively for use with their Solar Launch System, which is powered by 4 penlight batteries; hooking it up to a car battery may cause it to burn out without igniting its coating. It's very good for cluster ignition. FSI's "Electric Match" is fairly large, and only fits their E60 or F100 engines; but it can be ignited with a very small battery, and lends itself to electronic ignition of upper stages. It also increases the efficiency and performance of the engine to a large degree, and is very popular for contests like Open Payload and Dual Eggloft.

Starting at the small end, we have the "mini" engines. A "mini" engine usually has a diameter of 15 mm or less, as opposed to the 18-to-21 mm "standard" engines. They were originated by MPC's Rocketry division, which marketed a

line of 1/4A, 1/2A, A, and B engines in a 15 mm diameter casing, under the name Minijets. These are still being made by Aerospace Vehicles, Inc., which bought MPC's rocketry operation several years ago. They are the standard in small - engine classes of competition, where frontal area and the drag it causes are a large factor. Estes has a line of mini engines called Mini-Brutes, in 1/4A, 1/2A, and A sizes. They are 15mm in diameter and much shorter than the AVI Minijets. Until recently, Centuri had a distinctive line of minies, in the 1/2A, A and B range; these have been discontinued and their minies are now identical to Estes.

In the A through C range, we find some sharp lines drawn. Estes, Centuri and AVI all manufacture, A, B and C engines with essentially similar thrust programming, NAR-coded A8, B6, and C6. Delay times vary. Estes and Centuri market a higher-impulse B engine, coded B14. All of these engines are in casings 18mm in diameter and 70mm long. FSI makes A, B, and C engines with different thrust programming: NAR-coded A4, B3 and C4. These are long-duration low-impulse engines, which cannot lift as heavy a load as motors with higher average impulses, but should be used in light vehicles designed to take advantage of the increased momentum of the long thrust duration. They are packaged in wider casings, 21mm in diameter by 70mm long.

Estes, FSI, and AVI all produce D engines. Estes makes one: the D12. It has an "average" thrust programming, and is a good all-round engine; however, it has shown tendencies to malfunction in the past. AVI makes a D6.1, with a relatively low initial impulse and a 3-second thrust duration; this is a record-setter as a second stage. FSI markets 4 different D engines: D4 and D6, which are long-burners, great for glider work or second stages; and D18, an engine with a high initial kick and a low sustaining thrust, good for altitude and single payload models: and D20, a load-lifter that is all "kick" to pick up a heavy rocket.

FSI makes the classic line of E and F engines. Each class has two motors, at opposite ends of the power spectrum. The E5 is a long-burning altitude engine, while the E60 produces a heavy kick of 24 pounds during its short burn. The F7 boasts the longest burn time of any rocket motor: nine seconds! It now holds the U.S. altitude record. The F100 delivers 40 pounds of thrust at liftoff, and burns for a mere .6 seconds; but it is the granddaddy of the "Load-Lifter" engines.

AVI has recently introduced a line of E and F engines called the Gold Series. There are two Es, an E11.8 and an E24. The E11 burns about twice as long as the E24, and delivers more initial boost. The AVI F engine is NAR-rated as



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Turning to the Howzat-Grabya Department for this month, we have a couple of pictures from the Broward County Model Rocket Association. This is an active club in Florida, which publishes one of the finest newsletters I've ever seen. You should be able to get a copy of the CAPCOM by writing to the BCMRA, 5670 NE 7th Terrace, Ft. Lauderdale, FL. 33334; single-copy price is something like 50¢. The lucky bums are right next to Canaveral, so CAPCOM has regular reports on NASA doings, as well as modeling activity. The photos are from their SMCC-2 meet held last year. Thanks, guys, and let this be an encouragement for other readers to send us word of what they are doing, care of MB's editorial office . . . wherever it is this month. (*Aw, come on! We told you we won't move again unless California breaks off and floats out to sea. wcn*). ●

**R/C Pylon . . . Continued from page 23**  
 in your home, for the odor will permeate these materials and these areas.

5. Discard all left over materials.
6. Do not contaminate the hardener.
7. Do not subject the hardener to physical shock, heat or sunlight.
8. Almost all of these materials are flammable to very flammable.
9. You must work in mild temperatures; between 50° to 90° F.
10. Sunlight causes the resin to cure faster. If possible, work inside of a building or at least in a shaded area.
11. Thoroughly clean bonding sur-

faces with sandpaper and/or non-oily cleaner, such as acetone or lacquer thinner.

12. Mix ingredients in a clean, disposable container. Never return mixed materials to original container.

13. Once the material is mixed, it will harden whether it is applied or not, so mix only the amount you can use in the allotted time.

14. Measure ingredients carefully and mix thoroughly. Too little hardener will not cure the resin; too much hardener will cause excessive heat, resulting in internal stress and bubbles.

15. You must work rapidly after the ingredients are mixed. Apply the resin to the fiberglass; let it soak in. Do not try to force the resin into the fiberglass. Usually it is best to apply the resin over as large an area as you wish to work and then work the air out of it. Try a small area first.

16. Do not try to work resin after it has started to gel or harden. If you do so, the resin will remain tacky.

17. When using a brush, dab with the end of the bristles to remove air.

18. Resin may be poured on, or spread with a squeegee, or with a roller or paint brush. Speed is important.

19. Air and bubbles may be removed from cloth or woven roving with a squeegee or brush. Air may be removed from fiberglass mat with a brush or rib roller.

20. Fiberglass materials can cause skin to itch. Flush with soap and water; do not rub or scratch.

21. Clean up all tools, etc., with solvent, such as acetone, before resin gels or cures. Discard all rags in fire-proof container.

## FINISHING YOUR "LIL' TONI"

Last month we left off with the airplane finished except for installing control surfaces and painting. I prefer

F23.8, which gives it a reasonable initial kick and a 3-second thrust duration. Since these engines are so new, we haven't received many reports about them; but they are rather high-priced, and the F appears to have a weight disadvantage. This year's NARAM competition will bring in more definitive results.

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to install the controls after everything is painted, so let's get on with that first.

The fuselage should be cleaned with soap and water to remove all traces of poly-vinyl chloride used in the mold release process. It should then be lightly sanded with 320 grit wet-or-dry sandpaper and wiped down with either acetone or lacquer thinner. I like to use K&B's epoxy primer, as it covers well and is easily sandable. I normally brush the first coat on, as this fills the pin holes better than spraying. Now sand off with 150 to 180 grit paper, used dry; if you're going for that super finish, spray on another light coat of primer and sand off with 320 grit wet-or-dry used wet. When sanding, make sure you don't sand down through the primer, as we want a solid white under-base for applying our color coats. You do want to sand off as much as you possibly can though, as primer is adding nothing but weight to your aircraft. If you used silicon carbide paper in your sanding, you must wipe the parts down with acetone or lacquer thinner again before painting. This paper can leave a residue of silicone, and it could cause a problem known as "fish eyes" when you paint.

At this point, you're ready to apply the finish. You may go with the usual epoxy finish or you may want to try a new paint, which is rapidly gaining favor... "Imron".

"Imron" is the trade name for Dupont's polyurethane enamel, developed for a high-gloss, durable, chemical and solvent-resistant finish, for use in commercial vehicles, aircraft, and boats, where exposure to severe operating conditions exist. It is a multi-component product consisting of a pigmented base and an activator, and can also be used with an optional accelerator.

The qualities of "Imron" that concern us the most include its resistance to the damages normally associated with high percentages of nitro that we occasionally use (we're talking about Formula 1 aircraft here), and the fact that if used with the accelerator, it may be retaped within 2-4 hours of application, or 6-10 hours without the

accelerator. The big bonus of using "Imron" is the wide availability of so many different colors in the automotive trade, and just recently the introduction of some of the most beautiful metallics that I've ever seen. Also, a "water-clear" clear is available that can be used for painting over ink lines and decals.

"Imron" is used by mixing three parts of pigmented enamel with one part activator. If accelerator is used; add 4 ounces per gallon of mixed pigmented enamel and activator. You'll have to figure out how much to use based upon the quantity you're mixing. It is sprayed on much like epoxy, with a medium coat sprayed first, and after allowing it to tack up, followed by a full coverage second coat.

A drawback to using "Imron" is that the fumes from it appear to be considerably more toxic than any product I've used previously and it must be applied with extreme caution and in extremely well-ventilated areas. It also seems to have a strong attraction for dust particles floating in the air, so you must be careful to spray in as dust-free an area as possible. It also appears, at first purchase, that this is an extremely expensive paint, but that really isn't the case; it's merely that we must purchase a larger quantity of materials than we're used to. For instance, the smallest quantity of pigmented base you can purchase is 3/4 of a quart, the smallest quantity of activator and accelerator available is a quart, and the smallest quantity of clear you can purchase is one gallon. If you elect to use the metallic colors, you must also use a special thinner which is only available in one gallon cans. I've taken the liberty of breaking these quantities down into quantities we're used to purchasing, and have quoted prices based on prices our local automotive paint supplier is charging:

4 oz. pigmented enamel, \$1.37  
4 oz. activator, \$1.95  
4 oz. clear enamel, 76 cents  
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2 oz. "Imron" thinner (approx. amt. to thin 3 oz. paint, 1 oz. accelerator, and 1 oz. activator), 20 cents

So, as you can see, the cost is really not out of line with what we're used to paying, and the additional colors it makes available to us is more than worth any additional cost. If the quantities necessary to purchase are too much for the amount of paint you actually need, you could probably get a buddy or two to go in with you on buying it.

Now to the crucial part of this review... Does the "Lil' Toni" fly? You bet your last Kelly fiberglass prop it does! The maiden test flights were made with the airplane slightly nose

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length . . . It was.

Formula I racing found C.D. Bill Hager in 1st with his STX40 powered Prather Toni, Dave Keats and his K&B 6.5 SR11 powered "Ricky Rat" in 2nd, and Bill Weesner's STX40 "Prather Toni" in 3rd.

Barrington, Ill., June 20th: The Northwest Radio Control Club and co-sponsor Chicago Pylon Club held Quicky 500 and Q-M races on this day. I must apologize to the Q-500 flyers, as the photographs and results have been misplaced and I will try to run them next issue. Quarter-midget racing was won by Denis Bielick and his Rossi powered "Lil' Toni", followed by Dan Santich and his scratch-built Rossi powered "Bonzo", and your columnist placing third with his Rossi powered "Lil' Toni".

That's it for now, race fans; the typist wants to quit and we're past the magazine deadline already.

See you at the Races!!!

**Half-A . . . . . Continued from page 42** prime purpose; it achieves correct part-to-part fit at running conditions. In order to reach the optimum condition for top performance you must work up to top power slowly. The engine can not be polished, honed, or lapped to its ultimate condition, it really must be run. **BREAK-IN TECHNIQUE**

Half-A engines require little break-in. This is due to the better-than-average manufacturing tolerances and the physical laws which enable a small body to get rid of heat faster than a large one.

The first object of your run-in technique is to heat-cycle your engine so that the metal will stabilize. Second, you must slowly increase power output so that parts may wear-in without ever overheating or seizing.

The technique which I find works well, is simple. Start out with a smaller propeller and lower nitro fuel than you intend to finally use. After a minute of slow, rich running, begin leaning the engine out. You have to listen to the engine sound carefully. As you lean the engine out, the tone should climb continuously; if it drops, richen the mix-

heavy, as the manufacturer does not indicate CG range on the plans and I'd rather be safe than sorry. I added three oz. of weight to the nose to get the balance point I wanted. The airplane flies just great! It's extremely stable in flight, has no bad slow speed characteristics, and is a very competitive aircraft.

First flight was on a Saturday before a contest (seems that's the way building schedules always work out) at Barrington, Ill., for a Chicago Pylon Club race. We were lucky enough to place third in competition with seventeen other contestants, and also turned the second best time of the race being only two seconds down from best time. As for the elusive balance point, we finally removed the three oz. of dead weight in the nose and still had a great flying airplane. Without that nose weight, the airplane would still whip around a full up-elevator pylon turn without any tendency to snap-roll out of the turn. Our final balance point wound up 1-1/2 inches back from the leading edge as measured out at the wing tips. Suit yourself, only don't try flying tail heavy.

My only wish is that the airplane had lasted past the race held the following week at Alliance, Ohio. Check the race reports in next month's issue (sigh).

#### RACE REPORTS

Okay, you turkeys, you know we're serious about this column, and to keep

it from being provincial we need race reports and black and white photos of your contests. Let's get with it! Be sure to include information on who, what, where and how. If you elect to write on the back of the photo, use a felt tip pen and separate the photos with a piece of blank scrap paper so the chemicals on the photo don't transfer the ink and ruin the picture. (Or place them alternately front-to-front and back-to-back wcn).

Dayton, Ohio June 12th and 13th: Quicky 500 was flown on Saturday, with 11 flyers competing. Final results were: Gary Villard 1st, Ron Johnson 2nd, and Bill Weesner 3rd. Quarter Midget was flown Sunday morning with Russ De Witt copping 1st with his "Miss Paranoia", powered by Rossi, and 2nd was taken by Fred Najor with his LR-1A, powered by Rossi, and Bill Weesner placed 3rd with his "Lil' Toni", with Rossi power.

In the process of finishing 3rd, Bill set a record (national?) time of 1:30.2, and had he been able to keep his engine idling on landing, his five 1sts would have brought home the bacon for him. We're sure that this is a legitimate time, as the starter and lap counter both had stop watches on Bill when he flew this time, and the C.D., Bill Hager, re-measured the course after Q.M. racing was over to make sure it was the correct

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ture up in a hurry, then let it run rich for 10 seconds or so to cool down. That drop-off is a sign that your engine is still too tight to run at full speed. During break-in, just try to get up to a smooth 2 cycle, not absolute top speed. Let the engine run fast just for a few moments, then richen it up again. Run it fast for a longer time each fast cycle.

Once you have run your engine to the point where it will run at a clean two cycle for an entire tank, switch to your final prop and fuel, and start over again. Work up to absolute top speed only in flight; there the engine will get enough cooling.

The break-in time required is very much a function of the engine, prop, fuel, and airplane. A Cox .010 usually is up to full power after half a tank. A Babe Bec with a 6 x 3 should run strong after two tanks. A Tee Dee with mufter, 5 x 3 prop, and racing fuel, will take nearly half an hour before it will run right, and still improve more for a long time after that. The hotter an engine runs, the more break-in necessary.

Throughout your break-in on a "hot" engine, occasionally inspect the cylinder for varnish. This is a real plague in small engines. It shows up as a visible yellowish-brown coating inside the top of your cylinder walls. Performance-wise, it shows up in an engine which won't wind out and hold peak rpm. The

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engine also tends to lean-out and die by itself, or needle valve setting is unsteady. Varnish is easy to remove, but must be done carefully. The tools needed are: wrenches for your engine, very fine (000 grade) steel wool, and a small dowel or popsicle stick.

Carefully remove the cylinder from the engine, and remove the glow head and gaskets from the cylinder. Examine inside the cylinder against a bright light to see how much, and where, the varnish is. Wrap steel wool around the dowel and use it to scour the varnish off; use a rotary motion. Rotate the cylinder both ways and be sure to cover the whole wall

evenly. Do a visual check every so often to see when all the varnish is gone. Keep scouring until the bore is bright steel color again.

Use soap, water, and a clean rag or paper towel to clean the cylinder inside and out. Steel wool tends to shred into microscopic fibers which do ugly things when trapped between cylinder and piston. Dry the cylinder, douse it with fuel for lubrication, and re-assemble the engine.

You may have to repeat this operation after every 1/2 hour of running at first, until the engine has really reached its

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**THIS MONTH'S MODELS**

First, we have a semi-scale R/C model of the plane that never was. Competition Models has a really interesting kit here in its all sheet wood SST. The canard/delta configuration is a super-stable, easy flyer. This particular model is set up for rudder and throttle control,

though you could go 3 channel and also add a movable "elevator" on the canard (forward stabilizer). This model is a real eye catcher.

Next, we have a picture of the greatest assembly of stunt talent ever for a 1/2A contest. The scene was in 1974 at the first annual 1/2A Precision Aerobatics National event. Would you believe a total of twelve Nationals stunt wins by these six men? The plane is L.M. Cox's Super Stunter, the only design flown in the event that year. Tom Dixon won in '74, and everyone was turned on enough to make 1/2A at the Nats a regular happening. The Super Stunter is the only ready-to-fly model capable of the full AMA stunt pattern. Incidentally, it's my design; if you want to see something else, send me pictures of *your* airplanes!

The third model featured this month is R&N Models' Bleriot XI. This little free flight charmer uses Cox's .010 for power. This kit must be nearly unique, as pre-WWI aircraft are just not common in kit form. Plenty of wing and a high drag structure should make this model easy to trim and hard to lose. Just the

ticket for calm evenings at the local school yard or free flight scale competition.

Fourth model this month is Ron Young's original design 1/2A free flight. This model really is still competitive, but Ron says it's obsolete. He now prefers larger models with Seelig timer-actuated auto-surfaces. The model Ron is holding is still pretty sophisticated. It features full geodetic construction, built up pylon, neatly faired and fibreglassed nose, fuselage mounted D.T.

Although Ron mostly flies FAI Power, he is always a contender when he breaks out his "little one."

Final model for the month is a 1/2A Streaker. I'm sorry I didn't get the builder's name, as this model was on display at the 1976 MAC Show in Anaheim. Built from the Allied Hobbies kit, it features a vacuum formed canopy and turtledeck, also wheel pants. This 1/2A pylon racer was absolutely beautiful in its red and white decor. That walnut stand is sharp too.

**HANDY HINT TIME**

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why not use the .049 Golden Bee R/C engine? You can swing a 6 x 3 propeller easily, and throttle back to the power level you want. You could even rig a free-flight tick-off timer to kick from full to low-throttle for the gentlest of landings, even with a heavy model.

Next, I recently read an article (in another magazine!) where the author said his "Black Widow" runs for only 90 seconds on his R/C model. It happens that the engine should run almost twice that time. The Baby Bee, Golden Bee, Pee Wee, and Black Widow reed valve engines from Cox all are set up for control-line flying as they are assembled. The only exception is the new QRC from Cox Hobbies.

For free flight and R/C use, disassemble the fuel tank and move the fuel pick-up down to the bottom of the tank from the right side where it is originally set. Be careful not to lose the small black rubber gasket from between the venturi and backplate. Just snug up the screws on re-assembly. Too much tightening can fracture the backplate.

### COMING UP

Scale down that monster model and still get performance. And eventually: "Project Tee Dee," or, "how to gain performance if you don't mind risking an engine and voiding your warranty." ●

### Control Line . . . Continued from page 39

I'll let you know about them next month.

I keep trying to get my act together in Stunt, and figured the Stiletto from M & P to be the answer to my need for a new Stunt ship. A quick run through the kit indicated promise, but now that I've started building the plane, I'm disappointed that I didn't spend my forty bucks on a new Combat motor.

Here is my ol' buddy in Stunt, Arlie Preszler, to give his view on the Stiletto.

"Product Report . . . Stiletto kit by M & P Enterprises: This is a kit of the very well-known design by Les McDonald. It is one of his earlier .35 size designs. I saw him fly his 'Tigre .46 size Stiletto to second place (lost first by one point) at the Nats last year. It's a beautiful airplane, and Les, besides being a really great guy, is one helluva Stunt pilot.

"I looked forward with eager anticipation to building this kit. 'Fast' Richard Mathis, the 'M' in 'M & P', vowed not to change any of the dimensions to conform to more standard wood sizes . . . and he didn't . . . the moments and shapes are all consistent with the magazine-published version of this famous model. I found that a number of pieces, however, took a lot of cutting and fitting in order to make them work. The holes for the leadout wires did not all line up; I had to put double capstrips on 3 of the ribs and then sand them back because they were thinner than the others. I tediously weighed every piece of wing balsa and put the heavier pieces on the outboard wing. After I had the wing assembled, I put a pin in the leading and trailing edges at the middle, and on balancing the wing there, with the tip on the scale, I found that I had the equivalent of a 1/2 ounce of tip weight without having put any there. I forced myself to resist substituting wood, but the piece of 1/4 inch material for the fuselage bottom was too much . . . I substituted from my own stock and saved a whole ounce on that one little piece of wood.

"After I had the whole thing assembled and the controls installed according to the plans (It wasn't the way I install them, but who am I to question Les McDonald?), I just could not believe that 45 degrees flap and 25 degrees elevator could be correct. The kit plans show the control rod exiting from the

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center hole of the bellcrank to the top hole of the flap horn, and then, from the second hole of the flap horn to the end hole of the elevator horn. After getting ahold of the magazine plans, I discovered that the control setup was drawn incorrectly from the original plans . . . a drafting error . . . Hssss! Les actually had both rods going back to the bellcrank for more elevator than flap movement. I dug into my tail assembly and relocated the rod so that I at least have equal elevator and flap, Nobler fashion.


"With the judicious use of Monokote and careful finishing techniques, I think I am going to be able to bring my Stiletto in at 47 to 49 ounces . . . OK, but not great like it would be if about 4 ounces lighter from contest grade balsa throughout.

"This is not a beginner's airplane, because the plans are devoid of most details, and the instructions are given in broad generalities . . . it is not an expert's plane because the wood is not light enough. I'd like to see Mathis rework the instructions, correct some of the parts shapes, and try just a little harder to get some lighter wood. I could

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then recommend this kit to everyone . . . the way it is, well, you pays your bucks and you takes your chances."

Arlie says it pretty well. I'd just like to add that I am perfectly willing to pay forty bucks for a top-notch Stunt kit, but that the Stiletto, as is, simply is not worth the asking price. Too bad, I was expecting much more from M & P.

*(Editor's note: The following is Dick Mathis' response to Pretzler's report, which we sent to Dick prior to publishing Arlie's comments.)*

"Dear Bill: Arlie's review is, unfortunately probably correct. The big thing is the accuracy of the ribs, which we are trying to work out without going to die cutting. The wood selection problem stemmed from receiving more orders than expected on the initial run and running out of the prime balsa we had set aside for the Stiletto. That problem has already been solved, although I don't consider a 48-49 ounce Stiletto too bad.

"Anyway, we are discontinuing the Stiletto until we can work out the rib problem and figure out a way to make a profit on it. Believe it or not, the \$39.95 price tag isn't enough to cover things right now . . . just too much material and labor. Compare the Stiletto to a similar sized and sophisticated R/C kit and see what we mean.

"Those who know me well realize

that I have wanted to do a U/C Super Stunter for a long time, because I love stunt and a good kit will help the movement (and of course this company). Be assured we will work out the problems. Anyone who has a Stiletto kit with inaccurate ribs may return the ribs to us and we will correct the errors with no charge. Thanks for the chance to reply.

Regards,  
 Dick Mathis"

Latest in the new line of Combat kits from Midwest is the Matador, designed for AMA (or WAM) Fast Combat. Designed by Rich "von" Lopez, this is a good, competitive plane. I've seen Rich's own Matadors fly several times, and while they didn't exactly blow my mind with high speed or tight loops, they are definitely competitive with the usual Nemesis as flown by most everybody.

I feel that Midwest did a slightly better job with this kit than with the Lil' Snip, as far as plans and instructions are concerned. Still, there are a couple of things that look strange. Nothing that will really cause problems, just little things that production-oriented Combat builder/fliers don't bother with.

The die-cutting is OK and quality of wood is so-so. As with all of the Midwest Combat kits, a super-complete package of hardware is included, which is a nice touch.

Sure would be nice if they would add instructions for filling the bladder, not to mention starting and adjusting an engine on bladder pressure.

One recommendation on the plans is not only questionable, but downright dangerous, at least as far as I'm concerned. For props, a Top Flite wood 8 x 8 or 9 x 7 cut to 8-1/2 is suggested. The cut-down 9 x 7 may be OK, I've never used one. But I've seen a lot of Top Flite 8 x 8's throw blades, and would never consider using them on a modern, honkin' Combat engine.

At \$13.95, the price seems to be a bit high, even considering all the hardware supplied. Still, this kit gives you a chance to fly something other than a Nemesis, which may (or may not) add a little spice to your life!

ANOTHER NEW KIT . . .  
 DOWN THE ROAD

With the exception of the G-S line of kits, we poor ol' C/L fliers are building from kits that are, for the most part, quite dated. There have been many improvements in kit production, but most all of these improvements have gone into the R/C kits.

The G-S line of kits is a step in the right direction (in fact, most all manufacturers of R/C kits could learn a few lessons from Bob Smurthwaite, owner of G-S Products) and the next step may come from none other than House of Balsa. Now it is quite possible that you C/Lers have never even heard of this company, but they have a well-deserved reputation as a manufacturer of high-quality R/C kits.

House of Balsa is considering coming out with a profile Stunt ship, the Javelin, designed by Bart Klapsinski. I got to look at a prototype of this kit, when in Anaheim, and it looks real good. Bart says the plane flies great, and when you are as good a Stunt flier as he is, even Dirty Dan is a believer. And House of Balsa is capable of producing a kit the likes of which you've probably never enjoyed. The C/L market is ready . . . let's hope the Javelin is produced.  
 '76 FOX COMBAT SPECIAL.

In 1975, Duke Fox made an effort at dominating C/L Combat with his new motor. Most everybody knows what happened. The '75 engines had so many problems, it was unbelievable. Even my faith in Fox was put to the test, and I have always preferred Fox engines for Combat. When even Phil Granderson was unable to make the '75 Fox motors work, I gave up on them as a Combat motor.

But Fox obviously is determined to put Fox motors back on top in Combat, and he completely revised the design, and it is now billed as the '76 Combat Special MK III. All the old problems of weak cranks, bent rods, cases splitting, the motor going rich on outsides, and all the other problems, have been eliminated. At this time, we have had

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about a month's experience with the new engines, and Fox did the job right this time.

The motors start easy, have plenty of power, are lighter and shorter than 'tigres, run well on low or high nitro fuel, seem to be easy on plugs, and are willing to honk on most any of the normally-used Combat props. We've used Rev-Up 9 x 7's, 9 x 7's cut to 8-1/2, 8 x 8's, 8 x 8-1/2's, Taipan 9 x 6's, both full-blade and cut to 8-1/2, Grish (Tornado) 8 x 8's, all with good results.

Ron Scoones had the first of the new Foxes that I was involved with, and he ran it in stock, out-of-the-box condition. About 15 minutes on the bench and then on a plane. First run went lean (these motors *have* to be set very fat on the ground), but we richened it up a lot and the next runs were super. Went so fast on 40% that Ron dropped back to 25% fuel, just to keep the plane a bit more manageable!

My faith in Fox has come back out of hibernation. Thanks, Duke, I needed it! JUST A BIT ON PROJECT GOODYEAR

Last month, we left off with the plane painted and ready to go. However, before going flying, it would probably be best if we took the motor back off this hummer and made an effort at getting it broken in properly.

With a GMA Rossi, the break-in doesn't take very long to do, but it is important to do it carefully. Mount the motor on a solid test stand and set up your tank system. This need not be anything elaborate, but it must be a pressure system of some kind. I took the easy way, by simply using a bladder tank. The pressure fitting in the back door of the Rossi was capped off with a plugged piece of tubing.

For a break-in prop, a Top Flite 8-4, cut to 6 inches, was used. This short prop allows the engine to really sing without putting much load on it. Do not use a stock 6-4, or a 7-4 cut to 6 inches. You're bound to blow a blade off, which can be real bad news!

Nitrotane 40% was used for the break-in fuel. Start the motor and peak it out almost all the way. Don't run it

over-lean, just let it settle into a slightly rich run . . . not four-stroking, the motor should be honkin', but just a touch on the fat side. Do a couple of two-minute runs on this setting. Let the motor cool completely between runs. On the third run or so, bump the needle a touch, again being very careful to not let the motor go lean. A couple of runs at this setting, and you're comin' along pretty well. Just keep on doing the two-minute runs (don't forget the cooling period between runs) and gradually keep leaning the motor out until at about the 10th, or 12th run, she is running flat out.

Our motor felt ready to go at this stage, but I put 4 more two-minute runs on it, using the same prop but switching to our flying fuel, 60% Nitrotane. The motor showed no objections to the 25,700 revs showing on the tach, so it was definitely ready to go racin'.

The above procedure was recommended by Kilsdonk, and it works. I know that many of you were wincing a little when reading through it, but quit worrying. This procedure actually is easy on the engine, as it isn't working to swing a big, heavy prop at low rpm. The rev's are a little high, but the Rossi can take it without problems.

Also recommended by Kilsdonk are the following fuel formulas, for those willing, and able, to mix their own fuel. Break-in fuel: 25-40% nitro plus 20% synthetic oil and the rest methanol. Flying fuel (also used for the last 4 runs of break-in): 55% nitro, 18% Ucon 731 oil, 2% castor oil, 25% methanol.

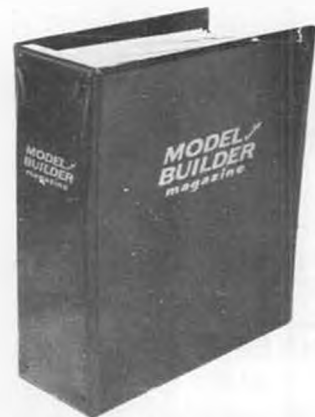
Hey, I just realized this is the 12th C/L column I've done for MB. Let's see, 12 months in a year, right? Well, Happy Anniversary to me . . . and all you poor souls reading this trash. Both of you deserve better.

F/F Scale . . . Continued from page 47

for bonding vinyls, butyrates, styrene, ABS plastics and foam, and is ideally suited for canopies. It is not very viscous, and a very thin bead can be laid down on an edge quite easily, but care

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should be taken that it is a thin coat, otherwise, when you push the plastic into place, it will ooze, ruining your job.

Have you ever tried using a plastic watch crystal as a wheel cover for vintage type airplanes? The other day I was walking across the school campus where I work, when my eye caught something on the ground. After realizing what I had picked up, I immediately saw the possibility of using this as a mold for vacuum forming wheel disc covers. They come in different diameters and are readily available.

I suppose one reason that F/F gas scale models aren't as popular as rubber models (I've discussed this previously) is that finishing can be more of a problem, since covering materials other than Japanese tissue have to be considered and models have to be painted, etc. Well, no one has ever said that F/F scale modeling is easy. There is no doubt about it; the finishing of a model, any model, can make or break the overall appearance. Here are some suggestions

for better finishing of your next gas powered model.

First off, one individual who is extremely ingenious and is always coming up with a better way of doing things, is Joe Tchirgi. Sometime back in this column we had a picture of Joe's magnificent Ponnier F/F biplane. Initially, Joe powered this ship with a Cox .020 Pee Wee (It is now electric powered). Since the model was going to be glow-powered, it needed fuel-proofing. Not wanting to use the conventional, so-called fuel-proof dopes, Joe came up with the following idea. He covered the entire model with white Japanese tissue, and water-sprayed it for tightening. Then Joe sprayed on Hobbypoxy Clear in a neat, even coat. To his surprise this finish came out remarkably well over the undoped tissue. Joe must have used some of the dulling agent, because it didn't have the usual gloss, characteristic of epoxy finishes. The finish was tight, smooth, and fuel-proof.

Another novel idea from Joe is his unique approach to finishing silk (I hope all of you read Ed Bellinger's "GYSOB" article in the July '76 issue of MB. Toward the end of the article he tells his method for finishing silk. I love the appearance this material gives, when either plain doped or painted, but getting that finish is tough. Too many modelers shun the work involved

and resort to the use of plastic covering (*Too many modelers don't have time to apply doped finishes, and if their work room is in the house, there is the odor problem. wcn*).

By reading Ed's article, you'll see that he thins the dope out, 20% dope to 80% thinner. He uses a brush that is 1 inch wide and puts on four very thin coats letting each coat dry before applying the next. At this stage, you won't see much of a dope build-up, however, add a bit more dope to the thin mixture and continue to build up until you finally reach a 50/50 dope-to-thinner ratio.

Joe Tchirgi's twist to all this is to use a polyester brush. Yep, it looks just like a piece of foam rubber. Weldwood sells one called Snap-a-Brush (I picked mine up at a Standard Brand store for \$1.49 with a refill.) The idea of this type brush is that paints, varnishes, and stains flow on more smoothly, with no brush strokes. With nitrate dope, it lays on an even coating that stays right on the surface of the silk, and none will soak through. Clever eh?

Several years ago, I wrote about a most unusual finishing technique, which is ideal for F/F scale gas or even R/C. I feel that it is time to report this method again. Keith Ward came to the Nats in 1972 with one of the most exceptional models I have ever seen (Photos of this model may be seen in the November 1972 issue of MB). His model was also finished in a most unusual way, and his technique is outlined herein.

There are eight basic steps to follow, so let's take them one at a time. First step is to cover the entire model, using light-weight silkspan, which is applied damp, with straight dope.

(2) Apply two coats of Testors clear dope, thinned 50/50 and using a plasticizer. I'm sure that any other brand of butyrate will work just as well. However, I'm not so sure about nitrate dope . . . although I don't see any reason why it wouldn't work just as well. Sand very lightly *only after two days of drying*.

(3) Apply one coat of Francis Resin, using 4 drops of catalyst for every ounce of resin. This should be thinned out 25% with lacquer thinner. This is brushed on and allowed to dry overnight, followed with another light sanding using 320 wet/dry sandpaper, DRY. The amount of catalyst-to-resin is important for good brushing.

(4) Apply another coat of the resin, using the same procedure as in (3), but this time, sand wet using both 320 and 400 grit sandpaper.

(5) If simulated stitching and rib tapes are to be used then follow this step . . . otherwise go on to step (6). Apply rib tapes using dope thinned-out 50/50, and apply the dope to the rib tapes only. Sand lightly and complete stitching. The stitching was accomplished by using white glue in a hypodermic sy-

ringe. A fine little bead of glue was laid in the proper location over the ribs (I would put the stitching down first, then follow with the rib tapes, since this is the procedure for the real aircraft.)

(6) The paint you will be spraying is polyurethane, thinned out with mineral spirits or lacquer thinner, or both. These control both the gloss and drying time of the paint. Let this dry overnight and lightly sand any flaws.

(7) Repeat step (6) and you should be done. Even light yellow will cover completely in two or three thin coats.

(8) Matting can be done with polyurethane semigloss floor varnish, thinned with lacquer thinner.

You will find this procedure will give you some amazing results. Quick it is not, but that has never been the name for F/F scale. Repairability of this method is such that if you need to patch up an area and then respray, you won't be able to find it.

In closing this month, I want to remind Southern California readers of the biggest scale event around anywhere, and that is the Flightmasters 27th Annual, on October 2 and 3 at Mile Square Park in Fountain Valley. ●

**Soaring . . . . . Continued from page 31**  
ship should make it all worth while.

They also fly sailplanes in New Zealand. The designs are similar, and once you are over the slope, there's no way to tell that you are south of the Equator. Snow Fenn, of Wellington, writes that it's mid-winter down there, so their flying activities are somewhat inhibited by snow (no pun intended) on the surrounding hills. Their Model Airplane Nationals are conducted at Fielding, a small airfield about one hundred miles north of Wellington. There, various individuals and clubs compete for the honors in control line, free flight, and R/C activities. They demonstrate their loyalty to the League of Silent Flight Achievement Program. Some of the pilots are also members of the British Association of Radio Control Soarers. The New Zealand Soaring Society now has about 150 members. They publish a journal to stay up on the latest news and calendar of events. We all wish the ocean weren't so wide so that we could fly together on occasion.

Last month I took part in the Berkshire Second Annual Contest at Pittsfield, Massachusetts. The Contest Director, Dick Nadolny, ran a smooth contest, with three parallel electric winches and a smooth grassy landing area. Fritz Bien turned in a consistently top-notch performance with his Maestro III, in spite of equally consistent high winds and significant turbulence. The 30 contestants took all this for granted, in spite of a number of wipe-outs in the local foliage. The final approach seemed hazardous enough early in the day, before

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the wind sucked everything toward the branches. On the following day I had a chance to visit the old Rhinebeck Aerodrome and witness original World War I aircraft in flight and even simulated combat. Here's a piece of recreated history you don't want to miss if you can drive by that way any summer weekend.

\* \* \*

Ran into an interesting situation. We had two electric winches in parallel. Both had been restrung recently with No. 18 braided nylon line. The first felt normal. The second pulled the aircraft out of your hand instantaneously. There was no take-up stretch in the line. The instant you closed the switch, your plane was in the air. No waiting for your security blanket . . . sufficient tension in the line.

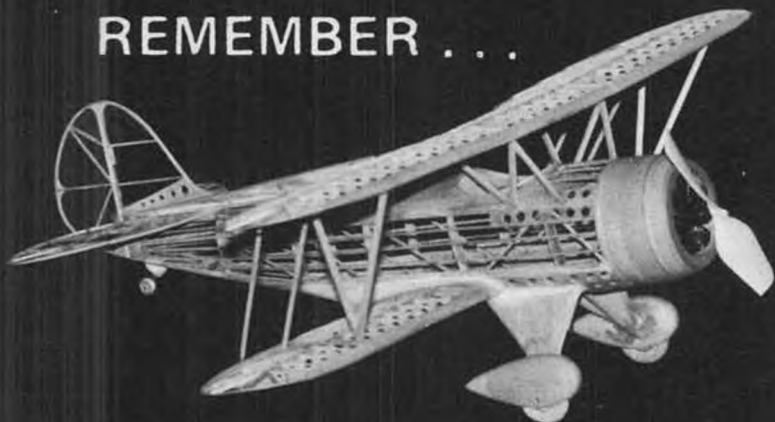
My first reaction was that this was different size line. It was different alright, but simply because the braiding was more tightly woven in the manufacture. My second reaction was to an answer to those pilots who break the line in order to delay their flight in contests (hoping that better lift will be theirs once the line is repaired and they return to launch). With no stretch in the line, you can't hold the plane back. The force builds up so rapidly that you might well destroy your aircraft if you are not really ready to launch when

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the switch is closed. Think about it. Maybe we've stumbled upon a solution to one of the sandbagging problems?

Last week I visited Jim Simpson, of EK Products, Inc., Irving, Texas. He introduced me to Bob Elliott, EK's President, and Gerry Krause, Vice-President, and took me on a tour of the facility. Bob is an Electrical Engineer. Gerry is a Mechanical/Aeronautical Engineer . . . a good combination for setting up a radio control manufacturing company. In the past twelve years, the company has grown to more than one hundred people with associates all around the world. According to Jim, their key is *reliability*. Every radio that is produced is individually checked for range after installation on their mock-up aircraft. Their warranty policy ensures no cost for complete repair of any damage within the first 90 days after purchase. You could splash the radio all over the concrete and it would still cost you nothing for complete repair. Their maximum charge is only \$25 for the next 90 days, and only \$35 maxi-

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mum, anytime, for the remainder of the first year. Pretty darn cheap for that kind of service. They then offer a reissue of this warranty for the next year for \$50. Pretty good evidence that their radios are really reliable (otherwise they would be out of business by now.)

In talking with EK's repair department, I learned about the large percentage of returns which were clearly without radio fault before the crash. How many times have you heard the pilot claim a glitch caused that @%&\*&\*. First blame always goes on the radio, next the aircraft designer, and last the aircraft builder and pilot. I wonder if there's a lesson here. In any case, I can personally vouch for the care and efficiency of EK. I know they produce radios that "deliver the goods". When you put a precious plane into the air, it's worth the extra investment in a reliable radio system to control it.

\* \* \*

By the way, there are some nickel-cadmium batteries floating around that

test good but I wouldn't put them in my plane. Best thing to do is use the cells as packaged by the company who built your radio. They have the experience to know what's really worth trusting in this delicate end of the system.

\* \* \*

Almost everybody takes a crack at modifying a Hobie Hawk. On this trip, I learned that Bob Elliott believes in a larger vertical tail comprised of a fixed pin-and-hinged rudder. Ken Banks installed spoilers to aid his landing performance . . . a difficult installation in view of the compound curvature of the wing and requirement for precision control through the guide tubes in the fuselage. No doubt we will see further modifications of this bird. What's your mod?

\* \* \*

Another classic has been modified by Alex Mladenco. He's added one inch to the chord of his Windfree and fully sheeted these wings. He claims that this

improves its performance. I've seen it fly, and it looks good to me.

\* \* \*

Let's not forget the social problems which can arise from our activity in R/C soaring (or any other serious interests in hobbies/sports). How many wives (and sweethearts) look upon our joy as a disease? Perhaps it's time to ask why. Do we spend too much time building and flying? Do we leave clutter and balsa dust around the house, expecting it to evaporate through the care of feminine hands? Do we expect the girls to be interested in our activity, even though they have no such interest? Sorry, I can't answer these questions for you, but they remain questions which deserve to be addressed. No doubt the answers will differ from person to person and what's right for one may be wrong for another. But perhaps we should try to show the best of what we have to offer as a basis for closer understanding. Beyond that, we must always recognize the needs of others.

### "IS SOARING FOR THE BIRDS?"

At last! The 5th and final part of Jim Gray's excellent treatise on birds in flight and what we can learn from them. For the complete article, see the following four issues of MODEL BUILDER: Feb., Mar., April, and June, 1976.

E.H. Hankins, who spent a great deal of time in India in the early 1900's, made some exhaustive studies of soaring birds and meticulously recorded his findings. He reported that the cheel, a light vulture having a wing loading of about .55 pounds per square foot, takes off an hour or more before the black vulture, which has a wing loading of about 1.23 pounds per square foot; while the adjutant and the crane, which have wing loadings of 1.54 pounds per square foot are observed to soar only in summer time and during only the hottest parts of the day.

If we can assume that each bird is equally blessed with ability and configuration, then let's assign a maximum lift coefficient of about 1.4 to each bird. The respective forward gliding speeds than can be calculated for different lift coefficients; maximum, average and low . . . corresponding to thermal mode soaring, slope soaring and high-speed gliding. Although we know that wing loading does, in fact, change under these different modes because the birds change their area, we will ignore that fact for purposes of simplifying the comparison.

We can further assume that the lift/drag ratio of each bird is about the same; conservatively, ten-to-one. Using this value divided into the forward speed in each mode for the various lift coefficients, we can estimate sink rate and apply the results to thermal conditions found in the areas where these

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birds fly.

One can give the adjutant the benefit of the doubt and increase his estimated L/D to approximately 15 or even 20:1, and improve the soaring picture for him somewhat, but it still is not capable of soaring except in the strongest lift which only occurs during the high-sun hours of greatest insolation. We can see that the adjutant is heavy and fast, with excellent penetration and a speed range of about 30 to 50 feet per second, while the cheel is light and slow, with poor penetration and a speed range of about 19 to 27 feet per second. The cheel, in fact, corresponds very closely to average, present day R/C sailplanes!

Thermal strengths vary from 100 feet per minute to 800 feet per minute, with an average of 400 to 500 feet per minute. It is estimated that climb rate in thermals, assuming fair centering, may only be half of the absolute strength due to other factors, including sloppy flying and changes in the thermal itself with time. By taking three thermal strengths and subtracting the sinking speeds of these two birds at max  $C_L$ , we can get some idea of whether the bird will rise or sink.

These figures assume that the birds are always 100 percent efficient, which is unlikely, and the thermals often don't cooperate either! The adjutant needs lift at least 200 feet per minute, even to hold his own, while the cheel can really stay up in the light stuff, needing only slightly more than 100 fpm lift to remain airborne! It is not surprising then that the larger and heavier birds only venture forth during the hours of best lift, which greatly reduces their food-getting time. I would suspect, therefore, that nature has provided them with superior hunting ability to better utilize the time available; or, more likely, has given them a greater number of acceptable foods that they can eat. Typically a large vulture is a scavenger and not a bird of prey, so his energy expenditure can be less . . . all he must do is locate a dead or dying animal . . . and wait. He will wheel overhead in



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## VINTAGE AERO

1 THE GLEN TENAFLY, N. J. 07670

TABLE 1

	$V = 29.7 \sqrt{\frac{\text{wing loading}}{\text{max } C_L}}$		
	$C_L 1.4$	0.9	0.6
Adjutant (L/D = 10:1)	32 fps	40 fps	47 fps
Forward Speed	(22 mph)	(27 mph)	(32 mph)
Sink Speed	3.2 fps	4.0 fps	4.7 fps
Wing Loading	1.54 psf	1.54 psf	1.54 psf
Cheel (L/D = 10:1)	(13 mph)	(16.2 mph)	(19 mph)
Forward Speed	18.6 fps	23.2 fps	27 fps
Sink Speed	1.8 fps	2.3 fps	2.7 fps
Wing Loading	.55 psf	.55 psf	.55 psf

TABLE 2

Thermal Rate	800 fpm	450 fpm	100 fpm
Less Cheel Sink Rate Equals	1.8 fps (108 fpm)	1.8 fps (108 fpm)	1.8 fps (108 fpm)
Difference	+692 fpm	+342 fpm	-8 fpm
Adjutant Sink Rate	3.2 fps (192 fpm)	3.2 fps (192 fpm)	3.2 fps (192 fpm)
Difference	+608 fpm	+258 fpm	-92 fpm

large circles, thermalling, while he "eye-balls" the situation; usually first descending to a nearby tree, if available. His problem is that once he is grounded,

he has great difficulty taking off again; thus, he must be extremely wary.

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in summer are frequently between 200 and 500 feet per minute on days of good soaring and high insolation; whereas on poorer days, thermal strength seldom exceeds 300 feet per minute. Perhaps this is another reason that the larger and heavier scavengers and birds of prey are not found in the east in the abundance that they are found in the southwest. In any case, the road is clear for those of us who like to experiment.

However, there is no good aerodynamic or structural reason that we should not build sailplanes with wing loadings of at least one pound per square

foot! The sole excuse not to do so lies in the character and availability of suitable lift.

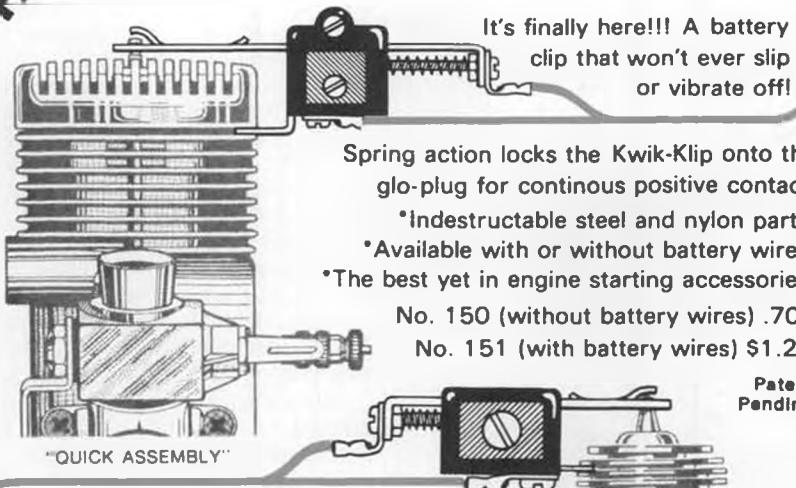
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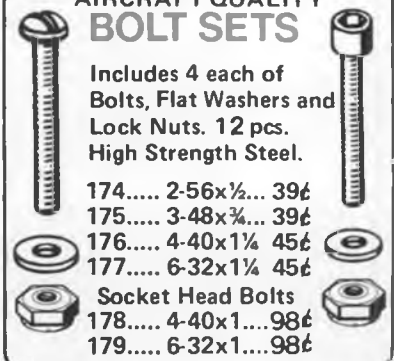
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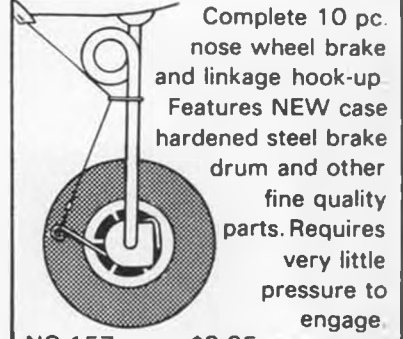
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Society of Engineers, Chicago, Ill.; reprinted in SOARING magazine, May, 1974; pp. 21-36, with foreword by Ralph Barnaby.

#### Plug Sparks . . . Continued from page 28

Bad weather in all parts of the state except, Lakehurst NAS, seemed to hold down the number of entries, as rain and fog can be a deterrent. Outside of some drizzle around noontime, the overcast held off all day.

Results of the meet, as gleefully pointed out by Beshar, were quite uniform . . . with Woody Woodman winning Class A with 311 seconds, Don Myers at 319 in Class B, and Al Schwankert topping Class C with 316. The closeness of scores indicates good competition, but also shows that most of the models have a uniform drift and are cut off about the same time. No real gamblers there!

Beshar points out shorter flights eliminate the problem of frequency overlap. However, it must be pointed out that SAM 21 and other California Clubs have been pioneering shorter flight times to also alleviate this problem. The Beshar rules are unique in that some modicum of free flighting is attained, but the average R/C Joe is going to remain unconvinced, as he feels any release of control over his model is going to result in junk. It will be interesting to

see if this type of event catches on. CONTESTS A' COMING

Don't know if we mentioned it or not, but the biggest O/T bash in the Northwest comes off on Sept. 12. Sponsored by the Williamette Model Club, the N.W. Old Timer Champs will feature all free flight O/T events, including one special known as the All Category Time Target (2 minutes). Beauty Event at lunch time. Site is Parker Field near Albany, Oregon. Map is on entry blank. For info, write Bob Stalick, 1120 Shady Lane, Albany, Oregon 97321.

#### BEAT HENRY STRUCK

We have plugged this contest before, but it is so darn interesting, we simply can't help writing about it again. Fully firmed up now by SAM Chapter 7, the meet will be held at Glastonbury Meadows on October 17. If you write the Contest Director, George Armstead, Box 514, Glastonbury, Conn. 06033, you will receive a complete list of eligible Henry Struck designs (which number better than 70!!).

The flight times as achieved by Henry Struck will be posted at the end of the contest. A tip to the times is that none will exceed 130 seconds. Scores will be figured as a percentage of Struck's time. All flight times will be averaged, with three flights allowed. Any number up to three may be declared for the average. There's an interesting gimmick!

In addition to this, proxy entries will be accepted. All models are sent at the owner's risk, before October 1. Please include return postage and the entry fee. Didn't think of that last item didya?

To round out the fun, a Postal Contest will be held for those who can't attend and don't want to send a model to be proxy flown. All flights must be fully attested. Entry forms must be in the hands of the C.D. before November 1. A photo of the model must be sent with the entry. How about that!

Incidentally, all entrants are winners in this great meet, as the proceeds go to the AMA Scholarship Fund. Now how else could you properly honor Henry Struck? Contributions and donations are welcomed.

#### EAST COAST CHAMPIONSHIPS

SAM 7 is again staging the Old Timer East Coast Championships at Westover AFB, Chicopee, Mass., on September 5. If you missed their July 18 meet at Rockyhill Meadows, here is a chance to compete. SAM 7 offers nine events with a minimum of trophies to third, loads of merchandise and high point awards to Junior and Senior. Besides the regular O/T events, there will be radio control and hand launched glider. Something for everybody!

Also worth mentioning is the successful SAM 7 Spring Rally. Although

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the weather was nothing to write home about, a good turnout of modelers showed up. Entries were down because of the heavy wind, but surprisingly, only two models were lost, being the victims of "unlimited" motor runs. Gotta set that timer!

The contest could almost be called the Comet Winners, as just about all events were won by Goldberg (Comet) designs; Ted Patriola in Pylon Gas with a Sailplane, Cabin Gas was won by Tony Acciavatti's Clipper, .020 Replica by Bob Lipori's Interceptor and rubber scale by a Comet T-Craft! In the rubber event, the old reliable Megow Korda Wakefield won handily. Sad to report,

the Towline glider (won by a Thermic) only had one entry, where in direct contrast, the hand launched glider event is really catching on with better than 10 entries. This may be a coming event!  
SAN VALEER ANNUAL

At times this column may seem like one endless chronicle of old timer contests, but ya gotta remember this is what attracts the old timers out of the woodwork. With the old timer interest on the upswing more every year, many clubs, like the San Valeers, offer a full complement of old timer events at their annuals.

The contest, hard on the heels of the US Free Flight Championships, suffered

from lack of entries. It was just plain hot. The best day was 105 at Taft. When it gets hot at Taft, there is simply no other recourse but to take it easy.

Due credit for a job well done, as well as endurance in the heat, should be given to Contest Director Jerry Comer of the Bakersfield Club, (known as the Bakersfield Flying Team).

Interesting models won some of the events; the most prominent being a scaled Valkyrie by Rudy Calvo for the .020 Replica Event. A Canadian Modelcraft Commando won the Class A-B Cabin Event. Phil McCary gives full credit to Harry Lowe, who scaled the drawings from Air Trails for the Pond Collection. Might also mention that Al Hellman won three trophies. Almost won sweepstakes! Wouldn't that have been something, the Honda 500!

Among some of the "newer" models spotted on the field was Jim Dean's .020 replica West'ner of 144 sq. in. wing area (Jim calls it his "Square-Footer"). This proved to be a very hot performer. Downdraft got 'em on the second flight. Phil McCary produced a Riser Rider that turned out to be a real performer. Phil had to rent a plane and scour the hills for the errant model. Found it half way up the slopes. If he can keep it, this model may prove to be a winner!

Maybe we should have put up a special heading for this paragraph, but persistence really pays off. For years (it seems) Larry Clark has been struggling with his Marsden Coast Champ. Finally, at the San Valeer meet, it really was performing. Even Larry doesn't know exactly what he did, as he has experimented with so many adjustments. Needless to say, Larry Clark won the Cabin Event, and was barely nosed out in the Antique Event. Take heart, men, if that turkey of yours is giving you fits, look at it real hard. You *still* may find the trouble!

An interesting finish to the flyoff in rubber between Wade Wiley and Bob Oslan ended in the flip of a coin for the winner. Would you believe both contestants broke their motors while winding? Needless to say, neither model was in condition to continue.  
HOT GLUE TIPS

In a first class bull session with Bob Hunter, who packages and purveys the original modeling cyanoacrylate, "Hot Stuff", some rather interesting facts came to light.

Most modelers who use the liquid glue to join their balsa frames find an almost instantaneous mating of the joint. However, the harder and heavier woods require longer periods of glue. Pitchy type woods, like pine, spruce, etc., have to be held for longer times than balsa.

Bob states that if you have the pieces you want to glue all made up, put them in a plastic bag with baking soda.

Shake well and remove. Watch that Hot Stuff smoke then! No question about it, drying time is speeded up immeasurably. (Like they tell ya, "Shake 'n Bake" can't be beat! wcn).

For the technically minded, the polymerization of these highly polar liquids (Cyanoacrylate adhesive) based on alkali cyanoacrylates,  $\text{CH}_2 = \text{C}(\text{CN}) \text{COOCH}_3$  together with a plasticiser, a thickener, and stabilizer, are catalyzed by alkali. Hence a light dusting by baking soda helps. For those who get stuck fingers, or want to "unstick" mistakes, the solvent for the polymerized material is dimethylformamide. See Eastman or your chemical house . . . and read the warnings!

SAM 26

We are a little remiss in not acknowledging the latest SAM Chapter in California, No. 26, as organized by John Le Seur of Santa Maria. John reports that with a start of only eight members, they are growing like crazy. As John sez, "As soon as we get through the growing pains, we will be contributing our part to SAM and to advancing the art of O/T Sport. Interested parties in the Santa Maria area should contact John Le Seur, at 1205 West Main St, Santa Maria, CA 93454.

Incidentally, if things go off as planned, SAM 26 will probably be the host club (again!) of the Pond Commemorative O/T R/C meet to be held in late September, at Santa Maria. Red Barrows, No-Name San Diego Club, reports he has all prizes ready to go. We'll clue you in on the date!

#### SPREAD YOUR BREAD ON THE WATER

The old biblical statement was never truer, as Bob Chambers will attest. When the VAMPS invited the SCAMPS to attend their contest, the SCAMPS members promptly took home six trophies, leaving only the pickings.

Now, according to the latest SLAM (Salt Lake Antique Modelers) News, Bob Chambers of the VAMPS attended their recent Spring O/T Contest and copped two firsts. How about that? About the only thing that remains now is for the Salt Lake boys to go to the SCAMPS Annual and clean house.

Might mention that the meet was plagued with rain. When it rains, those salt flats are almost impassable, as you sink in the water-saturated salt ground. Regardless, a dry spot was found and the meet continued full blast, with Clyde Goodenough registering a long awaited sensational flight by his Rocket powered Clipper. With the aid of a good (?) running motor and a puffy thermal, Clyde scored a flight of 13:38 in the Antique Event. Not to be outdone, Mark Fechner set a new state record of 20:53 with his Buzzard Bombshell. Great stuff!

#### STOCKTON O/T ANNUAL

The original! Still being put on by the

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AMPS of Northern California, this contest will be 16 years old. The AMPS have big plans for this 16th year, and are canvassing awards like crazy. Any and all donations are welcome. Whatcha got in that closet of yours?

The AMPS further state that the site is a little up in the air, as the Fresno flying area is under fire. Regardless, all will be informed when this classic meet will take place.

#### LATE NEWS

Just received the latest "Hot Leads" as edited by Jim Dean and to quote him, "At the Las Vegas Annual on Sept. 11 and 12, contrary to some opinion, Bud McNorgan and I will make another attempt to get you gutless wonders out of your rut. There will be another 'They Went That-a-Way' event. This is an UNLIMITED event. Any plane, any power, any engine run, R.O.G., timer stays at the launch area. Five dollars, winner take all. Perpetual Trophy and, oh yeah, this is a free flight thing." Like Brickner sez, if you wanna lose a model, here's your chance. This ought to be a wild one!

#### SUCH IS FAME

While browsing through the February 1975 issue of the Japanese magazine, "Control Line Technique," the writer ran across several photos of old time free flight models, evidently from the SAM Championships at Lakehurst in 1974.

Prominently displayed was Larry Boyer with his much repaired Comet Sailplane. The photo was in beautiful color, thus accentuating the white patches put on each wing tip (a result of a previous cartwheel).

All the writer can say is that Boyer is now internationally famous, with his photo appearing in such a prominent magazine. This is an excellent way of spreading the "gospel" on old timer flying. Incidentally, the photos were taken by Ron Moulton, Managing Editor of Aeromodeller, and apparently found their way into a Japanese publication via the swap method.

#### "DO-IT-YOURSELF"

When Dave Knight, a very active AMPS flyer, moved from Northern California to Washington state, he found that contest activity in Old Timers was at a very low ebb.

Figuring the best way to get something going is to do it yourself (this is a direct quote), Knight immediately staged an O/T free flight contest at Harts Lake, June 27. For a starter, Dave was quite ambitious, having six events! All types were represented from O/T gas, to rubber, to .020 replica.

According to reports received from other sources, a great contest and good time were had by all. Just what the Washington area needed, a real live spark plug! We will be featuring more



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writeups and photos in the future. Nothing succeeds like success!  
SAM CHAMPS

Next issue, we'll carry the doings at the SAM Champs. With the Champs leading off the Nationals, July 31, Aug. 1 and 2, the writer should make the deadline with time to spare. WCN don't you say a word! (Hmmm . . . wcn) ●

Remotely . . . Continued from page 19

with positioning second to none. Both Matt and Prettner were the only flyers who could be relied on to consistently achieve intersections and cross-overs per-

fectly superimposed, and who would make their looping maneuvers all the same size. A common mistake was making the first loop or inverted loop larger due to excess speed . . . and speed was the downfall of some of the rolling maneuvers which stretched anything up to 10 seconds. The 'M' caused most trouble and I did not see one really good one during the contest. Takeoffs and circuits tended to be ragged, with high 'G' turns thrown in which surely is a way to throw away points.

"Of the models and equipment there was nothing very revolutionary although there is now a crop of anhedral tail planes appearing (Prettner's influence). Webra Speed was the most common engine, though some of the pipe pumps and pressure devices hung on the rear part of the engines where real plumbers nightmares! No one radio gear was in evidence, though Simprop was slightly the most popular.

"After an impressive prize-giving ceremony the competitors, officials and friends adjourned in the evening to an excellent banquet held in the Military mess. The excellence of the curry mingled with good wine and, would you believe, Irish coffee, ensured that the evening was a great success and continued into the small hours. So ended the first and we hope not the last, European

Championship.

"Quote from some wit, 'What determines the degree of anhedral on the tailplane? It rather depends on which epoxy you use . . . 5-minute gives you 5°, 10-minute gives you 10°, or in other words, the slower the curing time, the greater the droop!'"

MILE HIGH DOIN'S

We received an interesting report on the 18th Mile High Contest, held at Denver, Colorado, June 12 and 13. Dean Sadler sent the write-up, while Larrie Schaffer did the photography.

Dean says that the pattern event might as well have been called the "Dirty Birdy Invitational", as the majority of contestants and a great many of the winners flew this Joe Bridi product. Most popular engines were the Kraft 61 and Super Tigre Blue Head, as the 5,000 foot altitude made plenty of power a prime necessity.

A special "Nervous Novice" category was established for those who had never before entered an AMA contest. It turned out to be both popular, and exciting. Hopefully some one will tell us exactly what was required of this group (Perhaps there is finally a class of competition in which Harold Goldklank can earn positive points!).

In Sport Scale, last year's Nats third place winner, Mike Sadler, was the top man, flying his veteran K&B (2) 40 powered, scratch-built Piper Twin Comanche. Two Dave Platt Wacos (Joe Hancock designed it, and is now sole owner of the company) appeared, and showed the public that it is a good flying model. Dean Copeland put up better flights than his fellow Waco entrant Glenn Witt, and took second place.

Bob Heitkamp took third with a Top Flite P-39, and Simon Dreese was 4th, flying a Midwest Pitts.  
SCRATCH BARNSTORMER

C.L. Pirtle, of Houston, Texas sent us some photos of his Barnstormer (May 1975 MB), stand-off scale 1930 Fleet trainer. Of special interest is the fact that Mr. Pirtle's plane (can we call you "Charlie"? ) was not only built from scratch, but he also blew up his building plans directly from MB's pages, rather than buying the full size plans (boo!). Shows that if you have the proper tools and ambition, it can be done. You'll note that we always provide a scale for this purpose.

Power is an O.S. Max 40, rotated 30° below horizontal, covering is Super Monokote, and all-up weight is 5-1/2 pounds. All wire struts were welded or soldered, and then flash chromed.

NEXT MONTH

Photos and story on Pattern and Scale at the 50th AMA Nats. ●

Workbench . . . Continued from page 6

Detailed coverage of many of this year's Nats will be coming up in the

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next two issues. Hope you like it. **SOUTHWEST MODELERS SHOW**

Scheduled for January 15 and 16, 1977, the first annual Southwest Modelers Show will take place in Dallas, Texas. To be based on the Toledo and WRAMS manufacturer distributor/dealer/consumer type trade show, it will be held at the Dallas Texas, Women's Building, State Fair of Texas. There will be model contests, demonstrations, and displays of industrial applications of R/C

... including General Dynamics, LTV, Bell Helicopter, and NASA.

The organizers, Mike Clark and Chuck Holden, have carefully researched the other model trade shows, and have gained enthusiastic response from many of the expected industry exhibitors.

More information will be published as it becomes available, but for now, make your plans to visit Dallas in mid-January. Model Builder will be there!

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\* \* \*

The Western States 1/2A Pylon Championships will take place at Sepulveda Basin, Van Nuys, California (LA area) on October 16 and 17, 1976. Sponsored by Cox Hobbies and the San Fernando Valley Flyers, there will be trophies through 10th place, plus fastest time. Entry fee is \$7.00. CD for the race is Ron Clem, 13001 Rose Ave., Los Angeles, CA., 90066. (213) 398-6865.

### THE SAGA OF BIG JOHN

The original Big John O.M.T. has returned!

Completed in time for the 1966 summer flying season, B.J.-O.M.T. (O. M.T. stands for One More Time, and this was the second B.J. prototype) was covered with the first run of red and silver Monokote from Top Flite. B.J. was also the first airplane on which it was discovered that the original, sticky-type Monokote was not compatible with open structure, fuel, and hot humid weather! Obviously, Super Monokote is not bothered by any of the above problems.

Following two active flying seasons, and publication of the construction article in the March 1967 issue of RCM (while we were M.A.N.'s R/C editor!), B.J. was sold at a Delaware R/C Club auction. The buyer, a Philadelphia modeler whose first name was Jim, stripped

off the Monokote ("peel" was more like it) and recovered the ship in clear-doped orange silk, with blue doped trim. He brought it back to the Delaware flying field, where we had a chance to fly it again . . . and also feel sick about letting it go.

B.J. eventually ended up with Fred Smith, a C.A.P. pilot, and modeler, from the Levittown, PA. area. At the 1975 WRAMS Trade Show in White Plains, N.Y., we ran into Fred, who told us about B.J.'s travels and that he currently owned it . . . maintained in good flying condition, Webra Blackhead powered, ProLine controlled, still in its orange silk, and still only weighing a modest 9-1/2 pounds . . . about 3/4 of a pound heavier than original.

Our attachment to old B.J. was too strong to resist attempting to get it back, and before leaving, we made an agreement with Fred for its return. Fred had had other offers, but held off in order to give us first refusal.

For the next year-and-a-half, we made all sorts of unsuccessful negotiations for a transcontinental trip for a 75 inch biplane . . . then came the 1976 Nats! With many modelers driving to the Nats from Southern California, our golden opportunity was here at last. We conned Col. Bob Thacker (which isn't easy!) into bringing B.J. from Dayton to California, and then contacted Fred. As it turned out, Fred was coming to the Nats as a working R/C official, could bring Big John, and was about to contact us!

Arriving late on Saturday, the 31st of July, we spent all day Sunday at Wright Field with the SAM Championships. At about 7 p.m. we dragged our aching feet to the motel, opened the

door to our room . . . and there, on the bed, Big John, all put together, complete with struts and rigging! It was a real, lump-in-the-throat kind of scene. Fred had talked the chambermaid into opening the door so he could bring B.J. into the room, assemble it, and leave a note saying "Welcome back after 10 years, Big John!"

### ONE MORE PEANUT

This one got lost in the profusion of paper work connected with our Proxy Peanut contest, but it should not be overlooked. It is the flight instruction sheet which Peanut originator Dave Stott sent along with his Russian designed Kalenin K-5 Peanut entry. "Hey Tovarich!

"You lucky falla! You are hero pilot to fly Soviet airliner vot vunce carry great leader of Russian pipples, Joseph Stalin, on tour of Ukranian Whit fields. (Capitalize Whit (Wheat) because we geddit from capitalist deze days!)

"Forst ting you got take it liddle elastic out of fuselage and puddit lonk motor from envelope insite.

"Gas tenk hold it 70 to 90 turns with 16 to 1 indoor winder. Pliz use it windink tube in case inferior Italian motor blows hop!

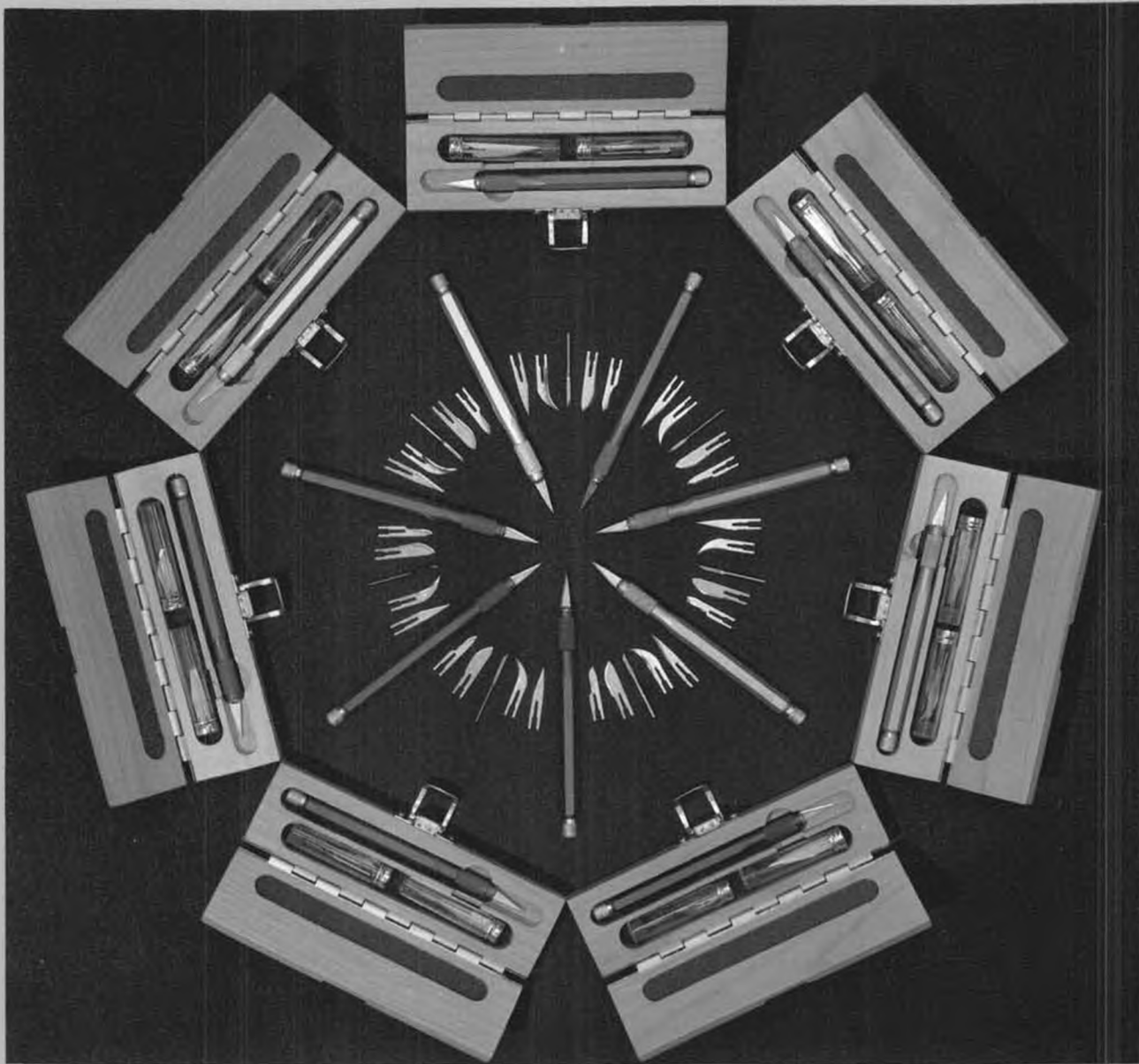
"Sedditt dummy motor with silver cylinder head on top (12 o'clock).

"Launch straight out. Ho boy! We got lots fun skiddin' with left wink down before finally settle down to right turn and stable flight!

"With this prop, this fine product of aeronautical genius of great motherland flies either insite, or outside.

"Now comrad, if you dun't geddit 45 secs each flight ve goddit opening for you in scenic Siberia where you can REALLY prove your salt!

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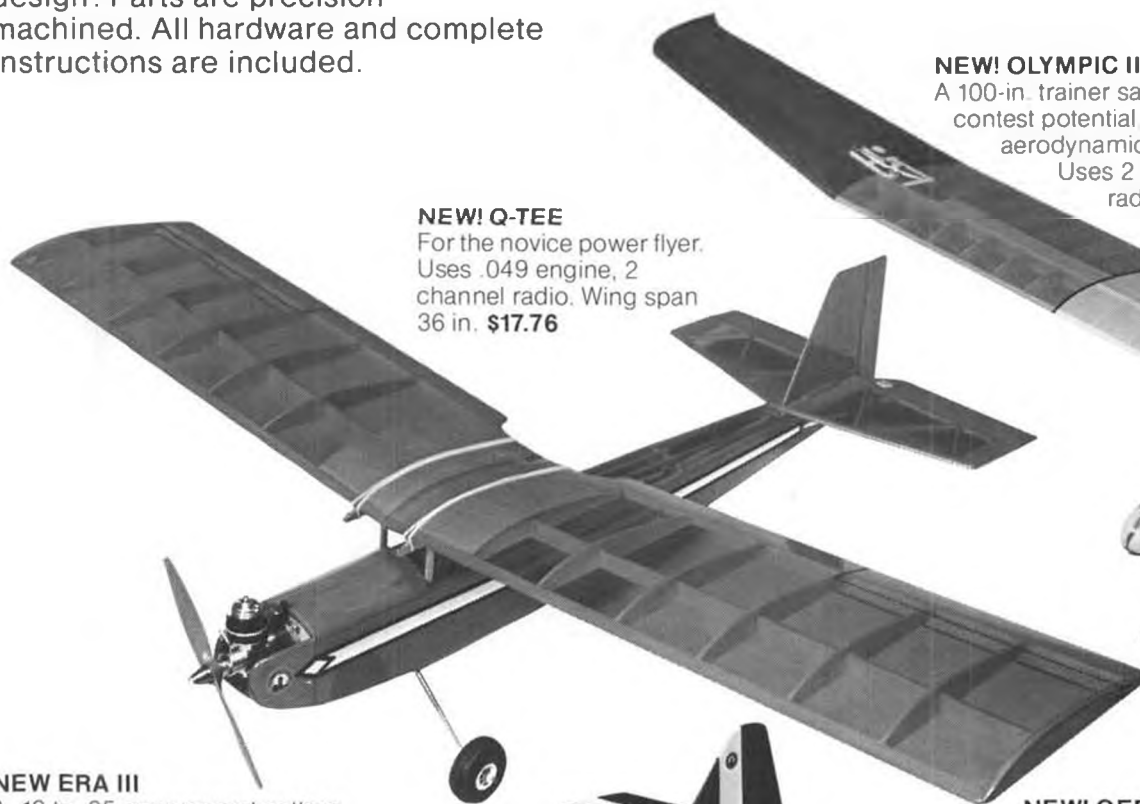
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