

RcM



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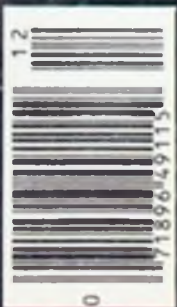
DECEMBER 1983

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radio control MODELER

THE WORLD'S LEADING PUBLICATION FOR THE RADIO CONTROL ENTHUSIAST





MODELER



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THIS MONTH'S COVER

features Tabby who is 17 years old, loves to model and has appeared on TV on PM Magazine. Tabby loves airplanes and is intrigued by her master Ray G. Southard's "Pitts Special." Photos of Tabby have been used on ABC-TV's "Those Amazing Animals," as well as several national posters and she has appeared on the cover of CAT's Magazine. Transparency by Ray G. Southard.

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FROM THE SHOP

RCM Staff

RCM went to Ida Grove, Iowa, to attend the I.M.A.A. Fun Fly Festival '83. The F.F.F.'83 was, without a doubt, the most spectacular modeling event ever conducted. Approximately 400 giant size R/C aircraft were registered by some 300 I.M.A.A. members who traveled from almost every state in the U.S. and from several foreign countries.

It was also a Disneyland with castles and parapets and knights in armor all over the place. It was a state fair with commercial exhibits, food and drink concessions and even cotton candy. It was an air show with hot air balloon races, fly-bys with WW II warbirds, the show stopping Christen Eagles Aerobatic Flight Team, and the breathtaking United States Navy Flight Demonstration Squadron, the Blue Angels. It was hot, three digit temperature.

It was also informative with tours through a factory that could be compared with Beech, Cessna, and Piper except for the physical size of the products. The amount of tooling and facilities utilized to produce the high quality R/C aircraft was unbelievable. Of course, we are describing Byron Originals, sponsor of the Fun Fly Festival '83. This brings us to the individual who made it all happen, Mr. Byron Godbersen, truly a legend in his own time. He is the President of Byron Originals and many other enterprises too lengthy to list.

From the RCM home office were Kathy Acton, Dick Kidd and Dick Tichenor. Our columnists, Dick Phillips and Jerry Smith also attended the F.F.F.'83 and will be presenting their coverage elsewhere in this issue. The Sierra Madre trio tells of things such as the delicious barbecued chicken at the picnic and the fine steaks at the banquet. The hospitality and comfort in Dewey Broberg's Bluebird motorhome. Luggage failing to make connecting flight transfer in Denver. Corn and soy beans as far as you can see. A Quarter Scale F-82 covered in aluminum Micafilm that was the most realistic metal finish ever seen was shown by Quality Line Kits.

They tell of Hazel Hester landing her full size Clipped Wing Cub on the R/C flying field and displaying it alongside the Sig booth. Dario Brisighella running Quadra engines in his booth. Frank Mills demonstrating Z-Foam Primer by Zapping foam material together as if there was no tomorrow. Pink clad Tony Bonnetti doing his thing for Circus Hobbies.

Oh yes, they talk about the tremendous numbers of R/C aircraft and the amount of flying, but we will leave that reporting to Jerry Smith and Dick Phillips.

The 1983 Fun Fly Festival was held in Ida Grove for the second consecutive year. The I.M.A.A. is considering holding their 1984 fun fly in southern California and Mr. Godbersen advised us that he will continue his festival in 1984 at Ida Grove. Regardless of what happens next year, the Fun Fly Festival '83 will be a tough act to follow.

★

Cyanoacrylate adhesives have become a vital element of model building and our staff members seem to use all the major brands by the bucketful. We are addicted to CA but we have a gripe that we will toss out to the CA industry as a challenge. We will offer a reward of 50 yen, extensive publicity, and our gratitude to the first company that will come up with a practical and workable non-clogging dispensing nozzle on a bottle of CA.

It seems that all too often when we are holding a part in position with one hand, reach for the CA bottle with the other hand, tilt the bottle to apply the glue and nothing



comes out. Then it takes two hands to clip off the tube or to shove a pin in the nozzle or to scrape away the accumulated lump on the end. Slightly annoying after we have been through this same exercise only a couple of minutes ago. We have tried banging the bottom of the bottle sharply on the workbench, wiping the end, and squeezing the bottle in order to clear the opening but, as yet, we have found no way that works every time.

Now let's see what happens.

★

16th Annual Tangerine Internats To Be Held At R/C World

Bob Schuster, President of The Remote Control Association of Central Florida, has just announced the successful conclusion of an agreement with R/C World of Florida, Inc., the developers of the "World's First Planned Community for Modelers," allowing the club to once again host the Tangerine International R/C Championships at the beautiful flying site at R/C World, Orlando, Florida.

The site at R/C World has undergone considerable change since last year's Tangerine. According to Schuster, "They have lengthened the runway to 450 feet and added a rather elaborate sun shelter at the flying site. With the first phase of residential development already underway, this will sadly be the last Tangerine to be held here."

Beginning on December 26 with the IMAC Nats (an outgrowth of the "Tanger-Vegas" event which proved so popular last year), this year's Tangerine will run through New Year's Day with Helicopter, four Pattern classes, Quarter Midget, Formula I, Giant, Sport and Precision Scale.

For complete information, write R.C.A.C.F., c/o Bill Williamson, CD, 1361 Acres Drive, Apopka, Florida 32703.

Yuletide greetings to all our readers from the RCM staff and may the fat man in the red suit be generous to you. □



Merry Christmas
from the Editors &
Staff of R/C Modeler

SUNDAY FLIER

Ken Willard



It is early in August as I write this. You will be seeing it early in November — the December issue of RCM. And it will be your last chance to enter the 1983 Dum-Dum contest. True, I've already got some beauts to select from, but who knows? You could outdo them all. I'm ineligible, or I'd win hands down — repaired a bulkhead using an instant glue, and, in the process, Zapped two servos into immobility when the watery fluid ran down the side of the bulkhead and on to the tops of the servos! Dum-Dum!

Here's a sample of another candidate. Bill Lowden, a newcomer to R/C, built an immaculate model of the Coot amphibian. Photo number one shows Bill with the Coot. Before I had a chance to check it out, I talked with Bill on the phone.

"It won't take off from water — just plows in at full power," said Bill.

As you can see, the Coot is an unusual design for an amphibious flying boat, since it uses the center section of the wing for lateral stability in the water.

"Maybe it's a scale effect problem," I opined. "The full scale job gets off, but maybe your model sits too low in the water. What does it weigh?"

"Fifteen pounds."

"Fifteen pounds! No wonder you have a problem. Even that Schnuerle ported .61 would balk at that."

"What do you suggest?"

"Bring it out to the field and I'll look at it."

So he did, and it was heavy.

I suggested he remove the landing gear (which is retractable) and plug up the wheel wells, saving some weight.

Also, he might try adding some light water skis to help it get up on the step. Photo number two shows the water ski set-up.

As I looked at the model, I noticed something.

"When you tried to fly it, did you have the prop on that way?" I asked.

"Yes. What's wrong with it?"

"Well, you've got it on backwards for a pusher, and you only get about fifty percent of the thrust!"

It was too bad that I didn't see it before Bill went to all the trouble of making the skis, because when we went out to try it, with the prop on in the correct setting, the Coot came up on the step and took off. Since it was heavy, the take-off was marginal and a wing dipped, making the model "ground loop," or "water loop," spinning around on one wing tip. But the skis were unnecessary. I excused Bill, since he is new to the sport and unaware of the prop setting. I kidded his associate, though, who is a fairly experienced modeler, although not too experienced in pusher designs.

I've got the usual "run of the mill" Dum-Dums. Like leaving the wing at home, shorting out batteries, reversing surface travel, and the like. But you may have a winner, so this is your last chance. Go for it!

★

The popularity of R/C seaplane and flying boat activity continues to grow. Here's a letter I received from Terry McGill, Portland, Oregon:

Dear Ken:

I am corresponding with Roy Tassell, a modeler in England who

publishes a quarterly ("Flying Boat") for their newly-organized British Waterplane Assn. They number around 100 members, even including a few non-modelers. They are organizing a National Championship for scale and non-scale "Marine aircraft" which are R/C. Roy wrote that they hope to "do" the Schneider R/C contest for 1983.

I thought you would like to know about this organization. I hope to see something akin to this here in the U.S. in the future.

Roy Tassell also has a request which I'll pass on to you: He wants to do a complete documentation in the magazine on the Vought Corsair ("Ye Olde Bipe"). I'm unfamiliar with it. He wants to obtain photos, drawings, details of all versions from 02U-1 through V.80. Can you print his request? His address is: Roy Tassell, Haddon House — Stogumber, Taunton, Somerset, UK.

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*Very truly yours,
Terry McGill
Portland, Oregon*

If any of you readers can help Roy, I'm sure he'd be most appreciative. Terry sent me a copy of the "Flying Boat Quarterly," and it's a fascinating publication if you like flying boats as much as I do. Incidentally, don't confuse the Corsair 02U-1 with the bent wing Corsair of WW II. The 02U-1 was a biplane that was catapulted off battleships. The painting of the Arizona in the memorial building in Pearl Harbor shows the pipes on the catapults of the famous battlewagon.

★

Oh yes, I knew there was something I wanted to tell you. I repaired the Stits Skybaby, and tried again. No luck. Banged it up again. But it will fly — just a matter of getting the control movements right. I'm going to have to wait now until next spring for the old "tall grass routine." Some time ago I built a peanut scale SE-5 and flew it successfully, but only after about seven "crashes" into tall grass before I got the control settings right. Only difference is, the Skybaby is gonna need some really tall grass — like a lush wheat field about four feet high. In any event, it's gonna work, and for all of you who have written asking for plans, be patient. It's gonna take time.

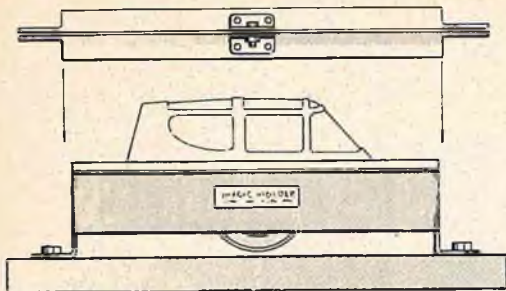
★

Recently I received a phone call from a former student at Parks Air College. He tells me he's 64 years old now, but still teaching students how to do aerobatics — full scale, that is. What he wanted to know was whether I knew of any kits, plans or photos of the Brunner-Winkle Bird biplane, a popular design of the '30's. I wasn't able to help him, even though at one time or another I seem to recall having seen an item about the Bird. So, if any of you readers happen to have any info on the Bird, he'd love to hear from you. He runs a small airport near Scottsdale, Arizona. Call Griff Sterrenberg at (602) 961-0122 collect, he says (unless you live in Australia, in which case write to me and I'll get the info to him).

★

There are so many great craftsmen building R/C models these days that it's hard to give them the credit they deserve. One of the problems is that the photos which are sent in are in color and, except in special circumstances, we can't use them. Black and white doesn't do the models justice, we all agree, but the photo doesn't have to be professional, when accompanied with a good description. I received such a letter a short time ago from Larry Hill, Vincentown, New Jersey.

WING New! MAGIC MOLDER

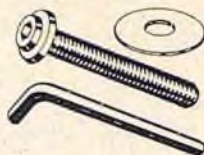


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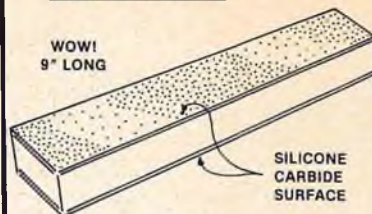


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Dear Ken,

Enclosed find photos of my Balsa U.S.A. "Taube." I modified the kit in several areas to achieve a "Stand-off Scale" look. I scalloped the trailing edges of the wing and stab, added ailerons, covered the fuselage back to the trailing edge of the wing with 1/64" plywood, added glue "rivets," then painted the ply to simulate metal. I also added dummy radiators, top and bottom "King Posts," and flying wires on the wing and tail area. Finally, I dummed-up a 6 cylinder, water-cooled engine.

The ship is covered with antique Coverite. The fuselage, fin and rudder were then sprayed with Krylon #2504 beige, to hide the balsa grain. It is powered with an O.S. Max .35, using a 10/5 prop and muffler pressure. The prop in the photos is a 12/4 which was

stained and varnished for display purposes.

The kit is a real value and no problems were encountered while building. She balanced "right on" with the addition of a 2 oz. prop nut (Harry B. Higley Co.).

The ship had two flights before these



photos were taken. There were no flight problems and no trim changes were needed. She flies at a realistic, scale-like speed and looks great in the air. All in all a very satisfying and fun project.

Best regards,
Larry Hill

Vincentown, New Jersey

The picture doesn't do the model justice, as I said, but as you read of the TLC which Larry used in building it, you just know it has to be a real beauty.

Next month I'll wind up the discussion on helicopter blade twist and propeller blade twist. Question — can a helicopter blade be used as a propeller?

Tune in next month for details.



1/4

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OR WHAT IT'S WORTH



Edited By Jerry Smith

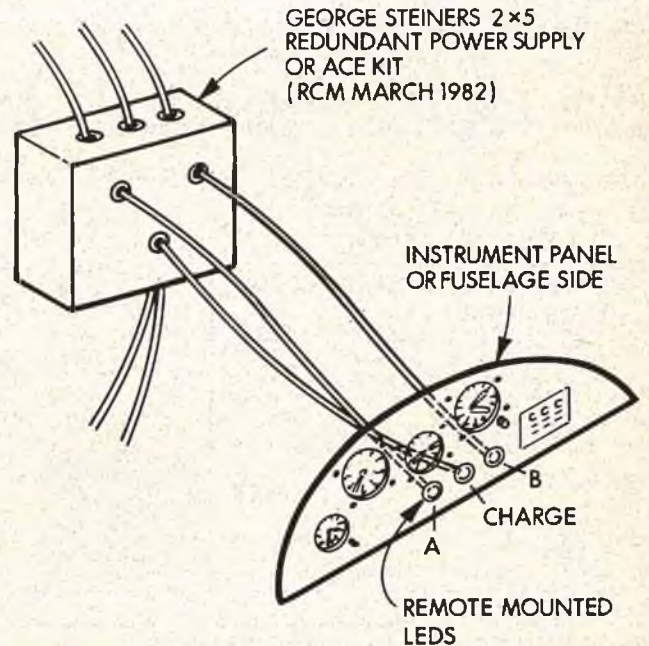
When planning your radio and servo layout in your next project, try this suggestion sent to us by Duie Matenkosky of Murraysville, Pennsylvania. Since most of us have the actual radio components on hand, we can move them around on the plans figuring out how best to install the servos, batteries, etc. What do you do if your equipment is already installed in your favorite airplane? Simply take the full size drawings you got with your new radio, down to the local Instant Print Photocopy shop. Have them make **clear transparencies** of your drawings. Should cost about .50¢/sheet. You now have clear plastic, full size, component drawings to lay on your plans. This idea works great when scratch-building or designing your very own project.

From Phillip Nickell of Longmont, Colorado, comes an idea concerning a method of adding lead weight to confined or oddly shaped areas of an R/C model for balancing purposes.

Recently, Phil had to add about two ounces to the nose of a plane with a tightly cowled engine compartment. There wasn't room for conventional lead weights, and a heavy hub wasn't practical. He mixed about two ounces of small lead BB shot (the kind used in shotgun shells) with enough epoxy to fill the gaps between the balls, and then applied the mixture to the appropriate area in the engine compartment.

The result of this method is a form fitted, compact, and fuelproof balancing weight. The size of shot that he used was about 3/32" in diameter, but smaller size pellets would give a higher weight to size ratio. Various sizes of lead shot are available anywhere ammunition loading supplies are sold.

Ty Safreno of Pleasanton, California, was fixing a bicycle pump when he discovered the check valve in the pump would make a very good one-way valve. He checked and found out that one could be purchased in a replacement hose for under \$2.00. Make sure the valve is steel and not plastic. Ty is currently using two valves in the fuel system on his boat. For pressure systems the valves are made to withstand 90 lbs. of pressure which is more than enough for any system in R/C use.



After successfully constructing a 2 x 5 redundant power supply from the RCM March 1982 article by George Steiner, Robert Minick of Pittsburg, Pennsylvania, found it worked just great. He did, however, find monitoring the LED's a bit cumbersome. His solution to this problem was to remove the LED's from the PC board and mount them remotely by running the leads through the existing holes in the case. Rubber grommets were inserted with no redrilling.

He mounted the LED's in the instrument panel of his open cockpit Travelair 2000, using snap-in LED lenses available at Radio Shack. The unit can be removed, leaving the lenses in the instrument panel. This installation allows him monitoring of his airborne batteries before every take-off.

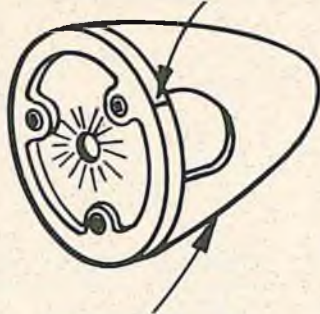
A note from George Steiner indicates one can replace the normal red LED with a Point Source (XC554C, Litronix RL 20 04) clear LED for a more visible display in the bright sunlight. The Ace kit can also be modified this way without degrading the function or purpose.

When using Carl Goldberg spinners and the prop is set against the line-up pin as directed in step #4 of the instructions, some props, with large trailing edge curvature, will interfere with the spinner cone.

This means you have to loosen the nut and rotate the prop slightly away from the pin while being careful not to cause interference at the leading edge.

This "trial and error" problem was solved in the following manner. With the tip of an X-Acto knife, scribe a line on a new spinner back plate. Set the trailing edge of the prop at this line. Not only does this give a correct first-time location, but it also means that the three spinner pins will

ON A NEW SPINNER SCRIBE A LINE ON THE BACK PLATE EVEN WITH THE TRAILING EDGE OF THE PROP WHEN FIRST INSTALLED. NOW INSTALL PROP TO THIS LINE EACH TIME.



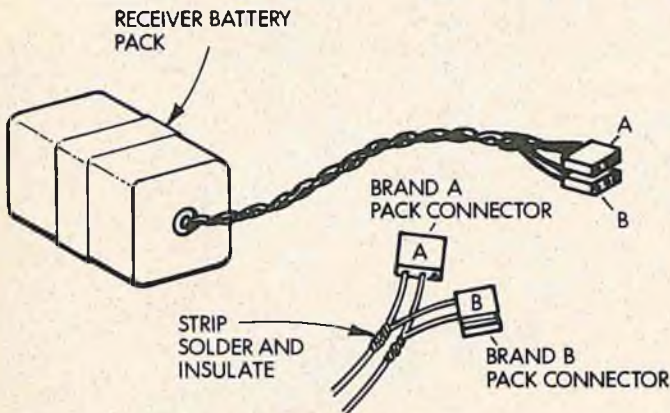
GOLDBERG SPINNER

always go into their same holes each time, thus reproducing the original factory assembly and balance. Thanks to Fred Schmidt of Livonia, Michigan, for this suggestion.

Here is an idea that may help you out of a jam. Next time you are installing your radio in a plane, take a minute and stick your name and address label on your receiver. Now if you forget to put your name on or in your plane, it will be there for sure. Thanks to Lenny Keer of Gilcrest, Colorado, for this good idea.

(Ed. Note: In the latest official model aircraft regulations, 1982-1983, governing sporting model aviation in America, kindly turn to page 133. In accordance with the AMA Safety Code, model flying must be in accordance with this code in order for AMA liability to apply. [6. I will not fly my model unless it is identified with my name and address or AMA No., on or in the model.] This does not apply to models flown indoors. Lenny is absolutely right!)

Here's a helpful suggestion for modelers who have two different brands of radio systems, e.g., Kraft and Airtronics. It is handy to have extra battery packs for both receivers which might be interchangeable. To accomplish this, wire an extra socket in parallel with each battery pack lead (see sketch) and Hot Stuff the connectors together. Be

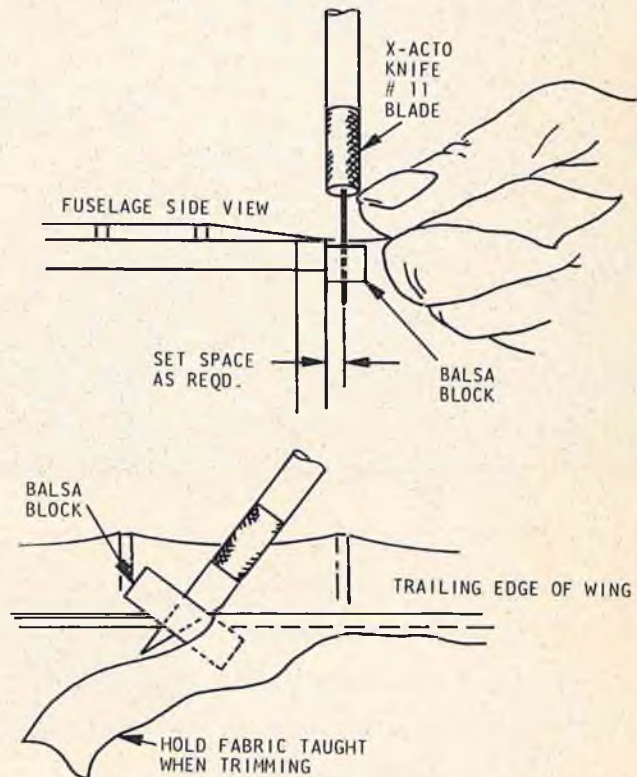


USE SPACER BETWEEN CONNECTORS, IF NECESSARY, AND HOT STUFF TOGETHER.

careful not to get Hot Stuff in the connector pins. Now either battery pack can be used with either receiver or charged with either charger. Thanks to Dr. Manie Rotenburg of Venice, Florida, for this suggestion.

While covering his latest model, George Harlan, Irvine, California, found he needed a 3/16" overlap. To insure a straight, even edge he tried several methods, but could not get a smooth, even edge until he tried the method shown in the sketch.

By the way, this is George's first ever use of an iron-on material, Hobby Shack's Solartex — and fantastic!



In the June issue of RCM, Mr. Al Sievers mentioned how to remove the adhesive smears from MonoKote using acetone. The solvent that seems to be the ideal, though, is Xylol (o,m, & p, Dimethylbenzene). It dries slower so there is less smearing by evaporation as is the problem with acetone, plus, it can be used equally well on most other plastics. How many times have you tried to remove those nasty price stickers from everything? This is **the trick**.

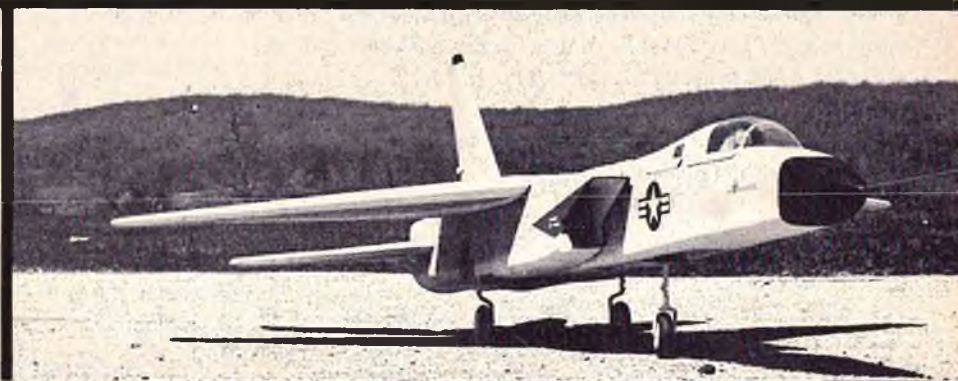
Small bottles of it can be purchased from Rio Grands Jewelers Supply, Inc., 6901 Washington N.E., Albuquerque, New Mexico 87109, (800) 545-6566, under the name of "waxsolvent" or "laboratory solutine." Thanks to Neal Martin, Wahpeton, North Dakota.

Send your hints & kinks to R/C Modeler, P.O. Box 487, Sierra Madre, Ca. 91024 — win a free book from RCM's Anthology Library series if your idea is used.

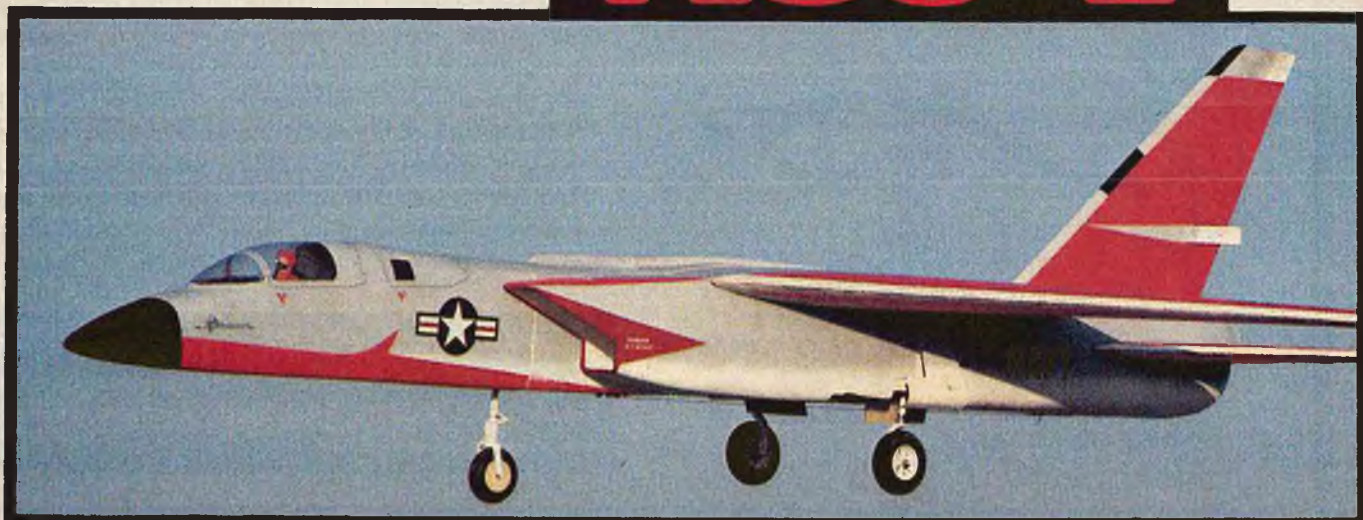


*An exciting design done in
1¼ Scale for two ducted
fan units. Photos by Jim
Lipshutz, Frank Gonzales
and Bill Kennedy*

By Mark A. Frankel

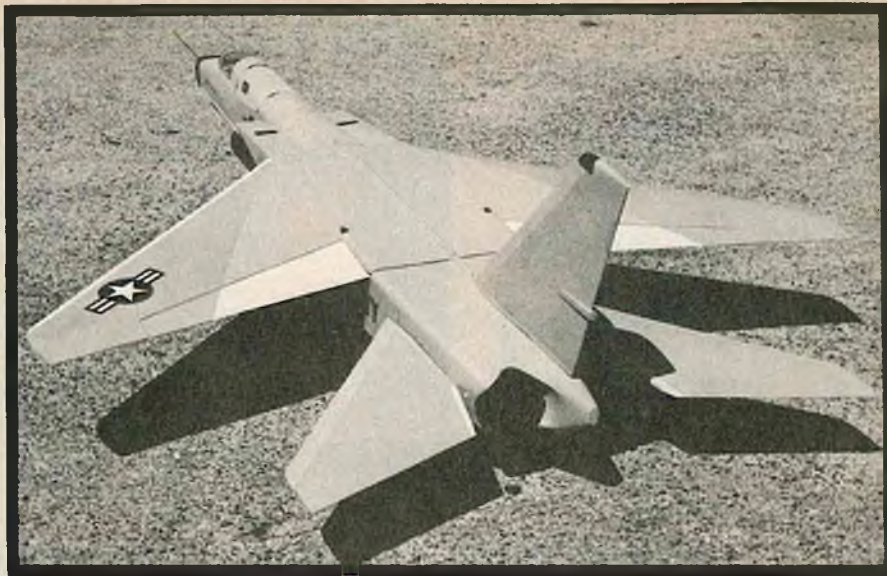


A3J-1



Introduction

In August of 1958, when jet technology was rapidly advancing, the Columbus Division of North American Aviation flew a prototype aircraft so sophisticated that 25 years later many of its features were just being assimilated into the current generation of fighters and bombers. The A3J Vigilante was conceived as a supersonic bomber with aircraft carrier capability. It was powered by two General Electric J79 dash 2 engines and possessed very exotic aerodynamic features. For instance, roll control was provided by a complex



NORTH AMERICAN A3J-1 VIGILANTE

Designed By:

Mark A. Frankel

TYPE AIRCRAFT

Stand-Off Scale

Ducted Fan Jet

WINGSPAN

66¼ Inches

WING CHORD

Root 24"

Tip 6"

TOTAL WING AREA

1126 Sq. In.

WING LOCATION

Shoulder Wing

AIRFOIL

NACA 2400 Series

WING PLANFORM

Swept Double Taper

DIHEDRAL EACH TIP

0°

O.A. FUSELAGE LENGTH

90½" (Without Nose Boom)

RADIO COMPARTMENT SIZE

Ample

STABILIZER SPAN

38 Inches

STABILIZER CHORD (inc. elev.)

17½" Root

STABILIZER AREA

264 Sq. In.

STAB AIRFOIL SECTION

Symmetrical

STABILIZER LOCATION

Mid Fuselage

VERTICAL FIN HEIGHT

14½ Inches

VERTICAL FIN WIDTH (inc. rud.)

15" Root

REC. ENGINE SIZE

(2) 7.5 ABC

FUEL TANK SIZE

(2) 12 Oz.

LANDING GEAR

Rhom Tricycle Retracts

REC. NO. CHANNELS

5

CONTROL FUNCTIONS

Stabilator, Ail., Throt.

Retracts & Nose Wheel Steering

BASIC MATERIALS USED

Fuselage Balsa, Fiberglass
Wing Balsa, Foam
Empennage Balsa, Foam
Wt. Ready To Fly 288 Oz.
Wing Loading 36.8 Oz./Sq. Ft.

series of spoilers and deflectors on the wings coupled with differential stabilators instead of conventional ailerons. The limited lift provided by extremely thin wings was augmented at low speeds by leading edge flaps and boundary layer control which was bled from the high pressure section of the J79 compressors. Weapon delivery was accomplished by ejecting a bomb rearward through a tunnel located between the engines.

The A3J evolved into the RA-5C during the mid-1960's and served in an active reconnaissance role until the late 1970's. While the RA-5C has a certain resemblance to the early A3J's, its appearance is distinguished by a deeper fuselage profile, increased air inlets and larger wing area.

I chose the A3J as a scale ducted fan subject because of its dramatic appearance and the feasibility of modeling it in a simple balsa structure. Since I was unsure of whether a twin engine jet of this size would fly, I wanted to avoid the effort and expense of making a fiberglass structure.

While the Vigilante offers simple lines that can be modeled easily with conventional balsa techniques, there are several problems that prevent it from being a serious AMA scale subject. First, the complexity of the full size control system would be

difficult, if not impossible, to model. The wing thickness had to be increased for structural reasons, and the main landing placement and retraction sequence is slightly incorrect. These deviations from true scale limit the model to a stand-off or sport scale role.

While the airframe is "traditional balsa" for the most part, there is also some fiberglass molding. The air inlet ducts describe a very shallow S-curve and their cross section changes from rectangular at the entrance to circular at the fan face. This shape can only be achieved in fiberglass. Therefore, before starting the Vigilante, the builder should feel confident with fiberglass lay-up techniques. Furthermore, vacuum forming is used to mold the canopies, and foam core cutting is required on the flying surfaces.

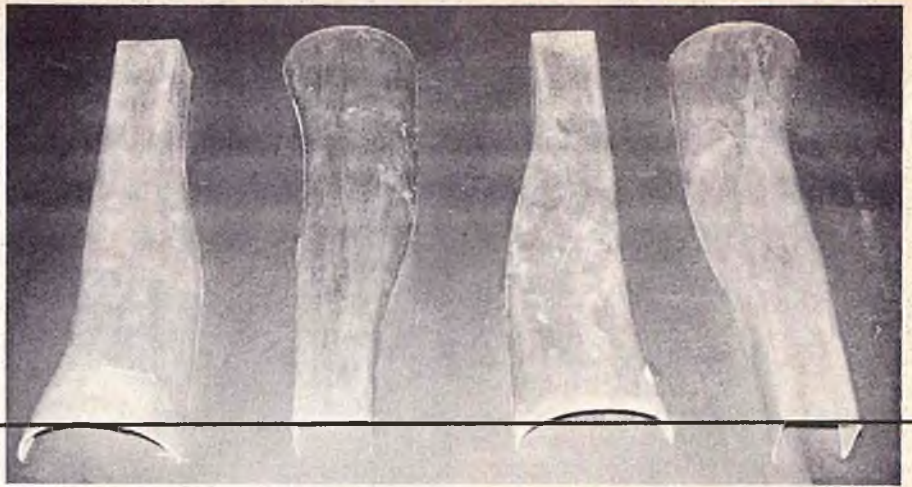
In terms of flying ability, the Vigilante should be preceded by some jet experience with models such as the Jet Hangar or Byron series of ducted fan fighters. Twin engine experience is not essential since the Vigilante's centerline thrust is identical to flying a single engine model.

There are several materials called for on the plans that are not available through normal hobby channels. These include low viscosity epoxy and cloth for the fiberglass lay-ups, and

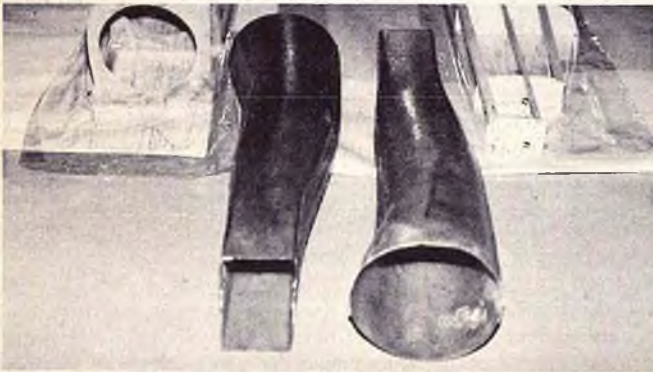




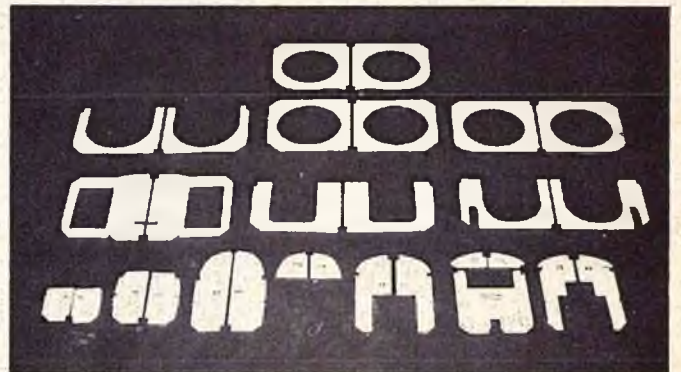
Inlet duct plugs after waxing.



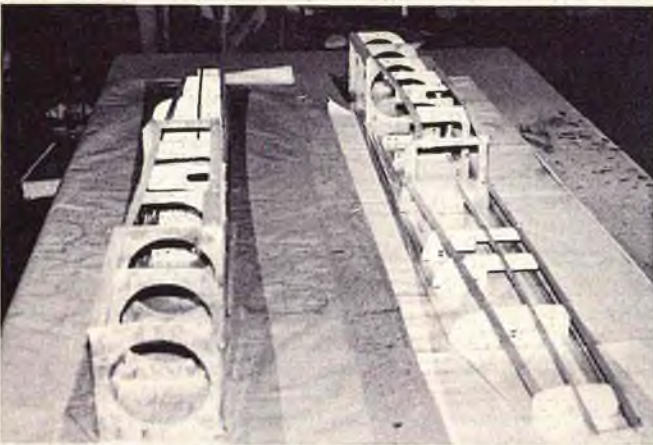
Inlet duct halves after release from the plugs.



Inlet ducts after joining halves with glass tape.



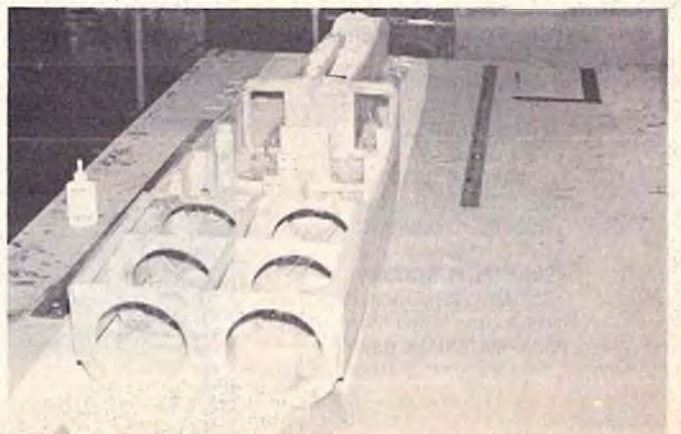
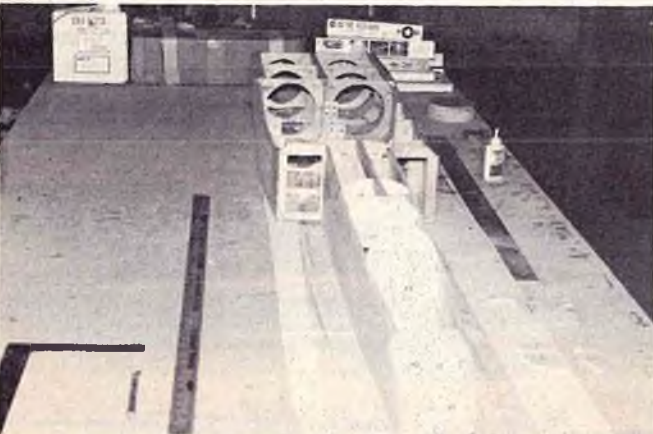
Complete set of fuselage formers have been cut.



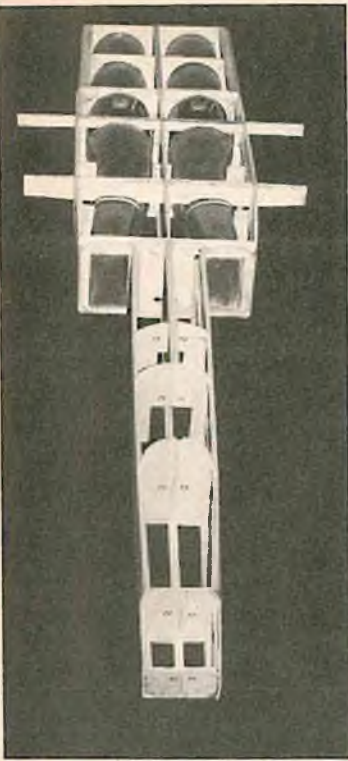
Fuselage halves before skin.



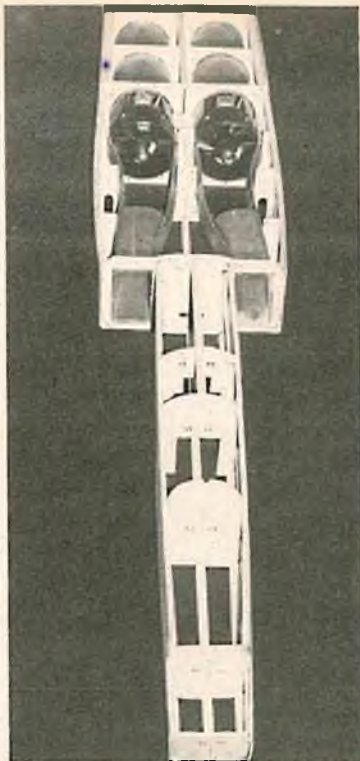
Fuselage halves after side skin has been added.



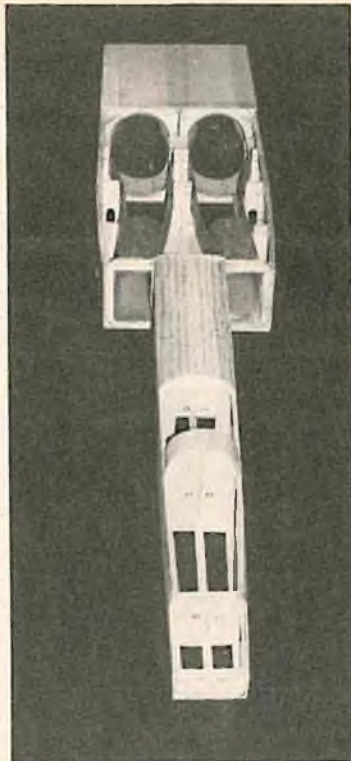
Front and rear views of fuselage halves joined at crutch line.



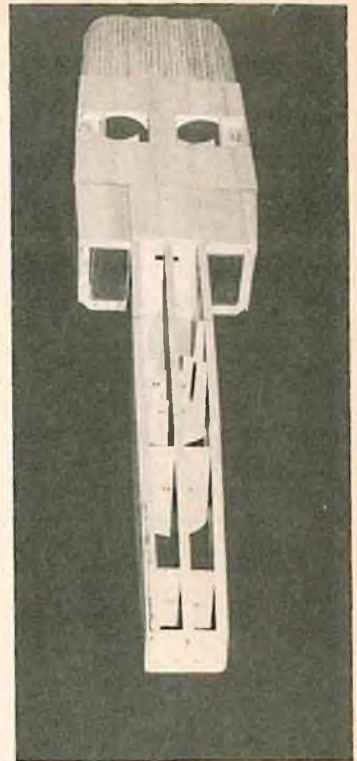
Fuselage with wing center section in place.



Center section removed showing access to fans.



Top skin and planking in place.



Bottom skin and planking in place.

polyurethane foam for the duct and canopy plugs. Aircraft Spruce and Specialty Company, P.O. Box 424, Fullerton, California 92632, is a good source for these items.

If you are hesitant to mold your own canopies or cut your own wing cores, Wing Manufacturing, P.O. Box 33, Crystal Lake, Illinois 60014, might be willing to supply you with finished parts. They will need airfoil templates and blank dimensions for the foam parts, and a well-finished male plug for the clear butyrate canopies.

CONSTRUCTION

Fuselage:

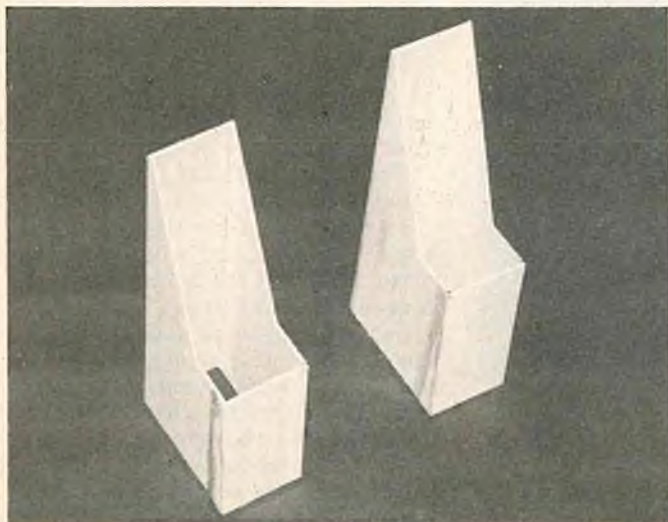
Obtain a 1½ gallon kit of Safe-T-Poxy, 2 yards of 2 ounce and 6

ounce bi-directional glass cloth, and a sheet of 1" x 24" x 48" 2 lb. density polyurethane foam from Aircraft Spruce. Make a frame for the inlet duct plugs by gluing formers D1 through D4 in place on a 1/4" base. Note that you must build an upper and lower as well as a right and left plug. Fill the area between the formers with blocks of polyurethane glued in place. Carve and sand the polyurethane to conform to the formers. Coat the polyurethane with a layer of 6 ounce cloth and polyester resin (Sig, Hobbypoxy or K & B are acceptable). Then perfect the finish on the plug with additional coats of resin until there is a smooth contour from D1 to

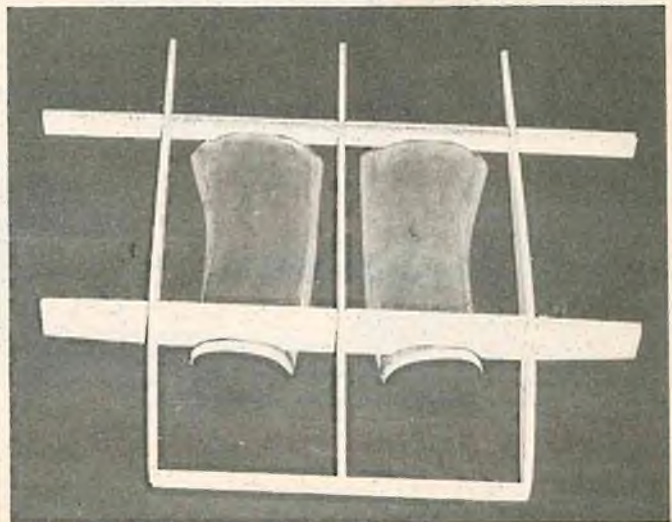
D4.

The actual lay-up of the duct halves is preceded by a careful waxing of the plugs. Butcher's furniture wax works well as a release agent with parts of this size. Be sure to coat the plug well, and buff the wax to a high luster.

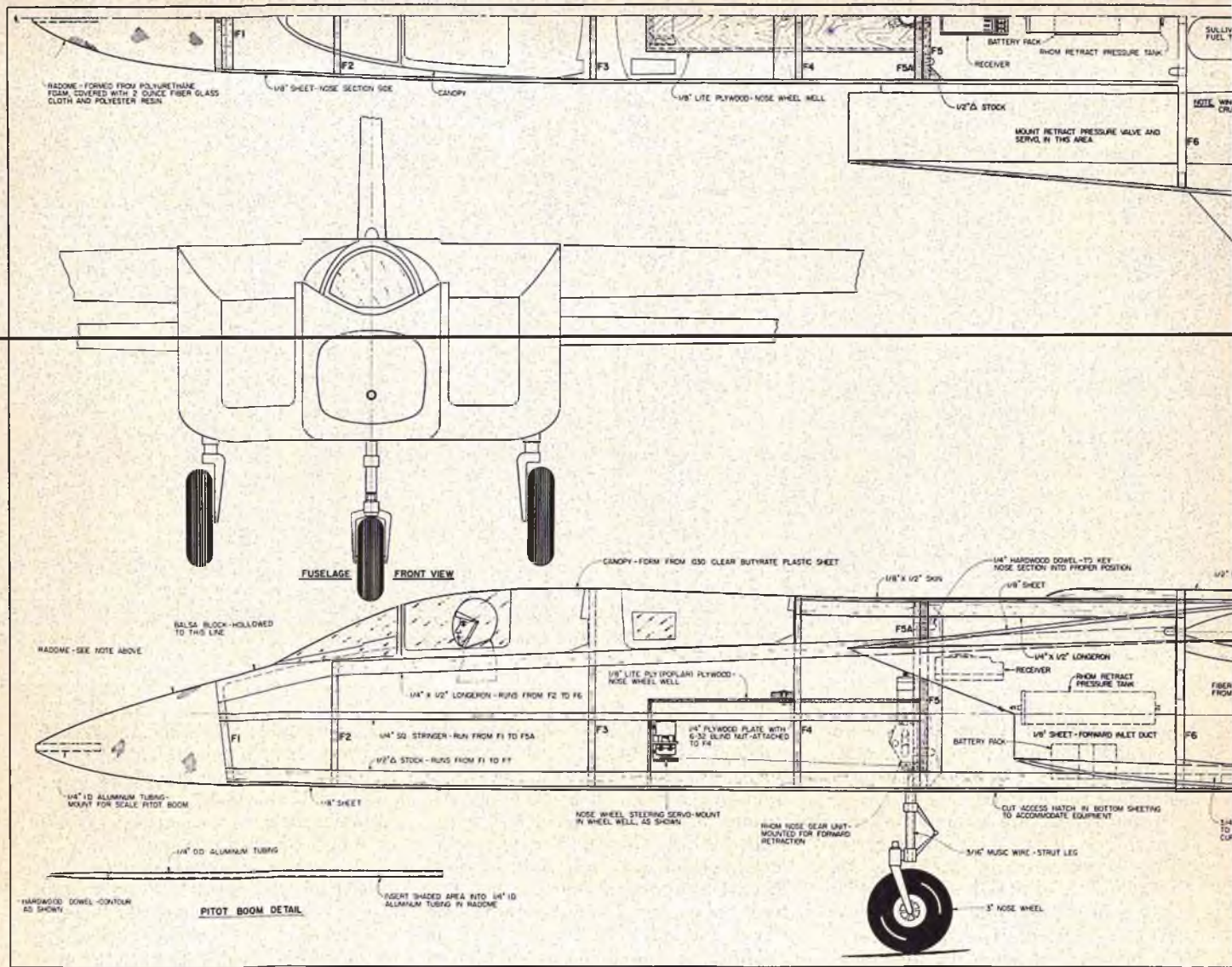
Drape a layer of 2 ounce glass cloth over each plug and brush on enough epoxy to fully saturate the weave. Follow this with a layer of 6 ounce cloth, again brushing on just enough epoxy to fill the weave. Allow the lay-ups to cure for 24 hours, then peel them off of the plugs. Trim away the "flash" and join the upper and lower halves with masking tape. To insure the fit of the ducts, temporarily insert



Forward inlet ducts made from 1/8" balsa.



Wing center section with hatch covers.



Major components disassembled for transportation.

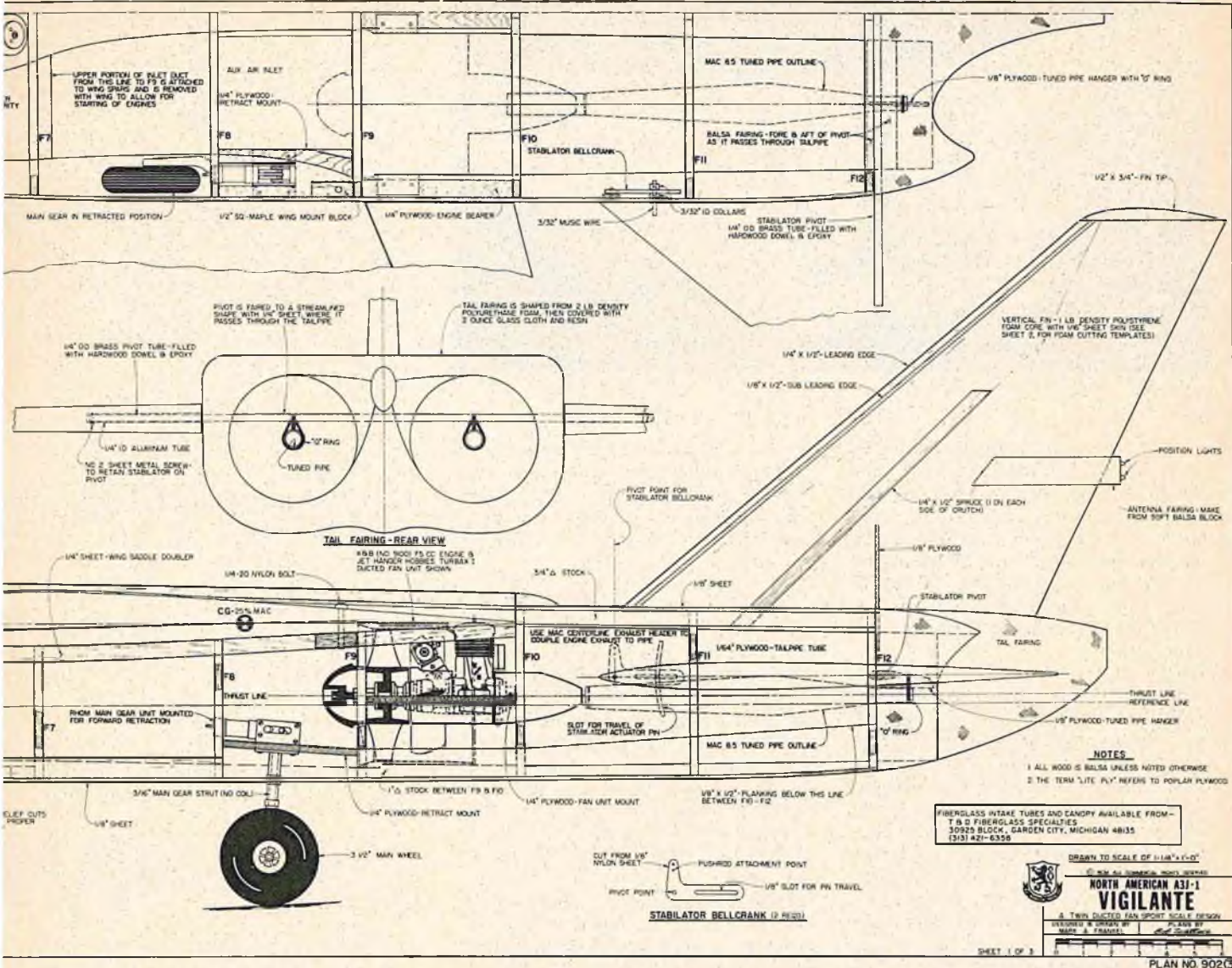
the fan shroud at the circular end and a rectangular bulkhead at the intake end. Replace the masking tape with a layer of 1" wide fiberglass tape and

saturate the joint with epoxy. Once you have a right and left inlet duct, proceed to cut out the fuselage bulkheads. Laminate 1/32" ply with

Safe-T-Poxy on both sides of butt joined 1/4" x 4" x 36" sheeting to provide enough material for F6, F7, F8, F9, F10, F11 and F12. The remaining bulkheads are cut from 1/4" balsa except for F5 which is 1/4" ply. The bulkhead halves are assembled on the 1/4" x 1/2" balsa crutch. You are making a right and left fuselage half which will be joined later when the side skins are in place.

Slide the inlet duct into position through F6, F7 and F8, but do not glue it in place yet. Glue the triangular stock, longerons and wing saddle in place. Note that the triangular stock between F9 and F10 is 1" stock.

Epoxy the plywood doublers to the main fuselage skin, then glue the skin in position over bulkheads F6 through F12. Glue the forward skins to bulkheads F1 through F6. Remove both fuselage halves from the building board, and join together along the crutch line. Now the fan mounts and main landing gear mounts can be epoxied in position, allowing the fan

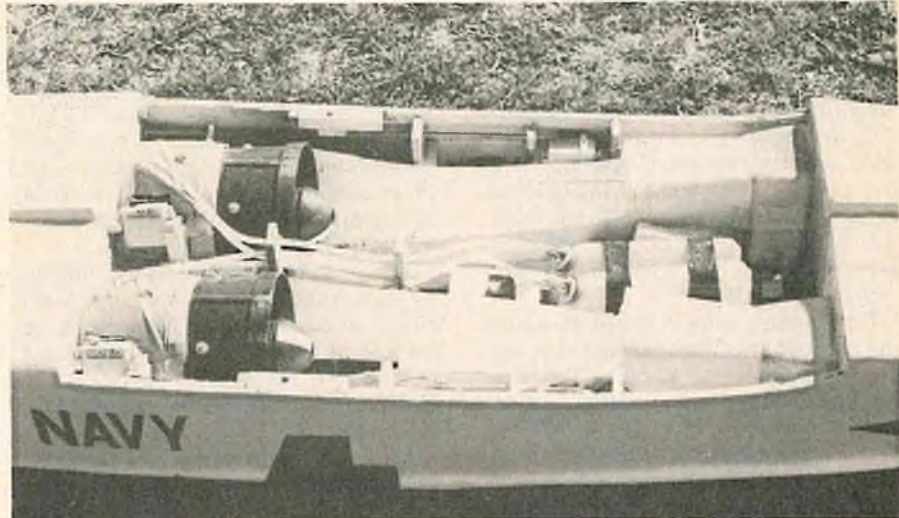


shrouds and retracts to be temporarily installed. With the fan shroud in position, the 1/64" plywood tailpipe is fit and epoxied between bulkheads F10, F11 and F12. The inlet duct hatch is cut and the duct is epoxied to bulkheads F6, F7 and F8. Be sure, however, that the duct does not adhere to the shroud.

The forward inlet ducts are simply boxes of 1/8" balsa. These are epoxied to the fiberglass ducts at F6.

The outer inlet skin is glued in place, then the top and bottom fuselage skins and planking can be added. All corner joints are carved and sanded to the proper cross sections.

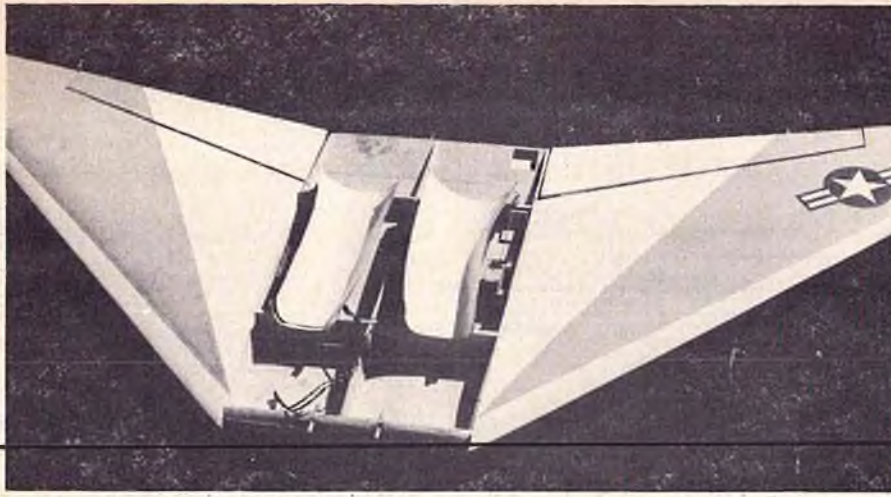
At this point the polyurethane plug for the canopies can be made by tack gluing a block of foam in position and carving it to shape. Finish the foam with several layers of polyester resin sanded smooth. The plug is then ready for vacuum forming the .030 butyrate canopies. The radome is formed in a similar manner, as is the tail fairing. Before permanently attaching the



Engine compartment with wing removed showing tanks and servos.

tail fairing, install the brass tubing to F12 which serves as the stabilator pivot. Note that this tubing extends through the tail pipes, and is faired to

an airfoil shape with 1/4" balsa to provide smooth exhaust flow. The tubing also supports the tuned pipe hanger.



Underside of wing.

My model has a removable nose to make the fuselage more transportable and to provide access to the battery pack. If you want a similar feature, razor saw the nose from the main fuselage between F5 and F5A. Install the 1/8" lite ply nose gear well to F5 and position the nose section to the main fuselage with 1/4" dowels which plug into F5.

Wing:

Begin with the wing center section which is composed of the forward and rear spars with the three center section ribs. Build the center section on the fuselage to insure an accurate fit. Then position the inlet duct hatches such that they mate with the ducts when the center section is in place. Epoxy the hatches to the spars allowing the hatches to remain with the center section when it is removed from the fuselage.

The wing cores are cut from 1 lb. density polystyrene foam, and covered with light 1/16" balsa. I used a thin layer of Safe-T-Poxy to adhere the 1/16" balsa skin. Epoxy allows you to carefully position the skin, it stiffens the core, and it is probably lighter than contact cement if applied in a very thin coat. Allow the skinned wing panels to cure in their shells left from the core cutting by placing weights across the entire area to insure uniform adhesion.

The leading edge is glued in place and cut to shape. Then the ailerons are cut from the wing panels, and the panels are joined to the center section with no dihedral. The center section should be skinned with 1/16" balsa. A center section fairing is built up of 1/16" sheet which blends the leading edge of the wing into F6, and the trailing edge into F9.

Empennage:

The tail surfaces are constructed from foam cores similar to the wing. The stabilator cores must have an aluminum tube imbedded to pivot on

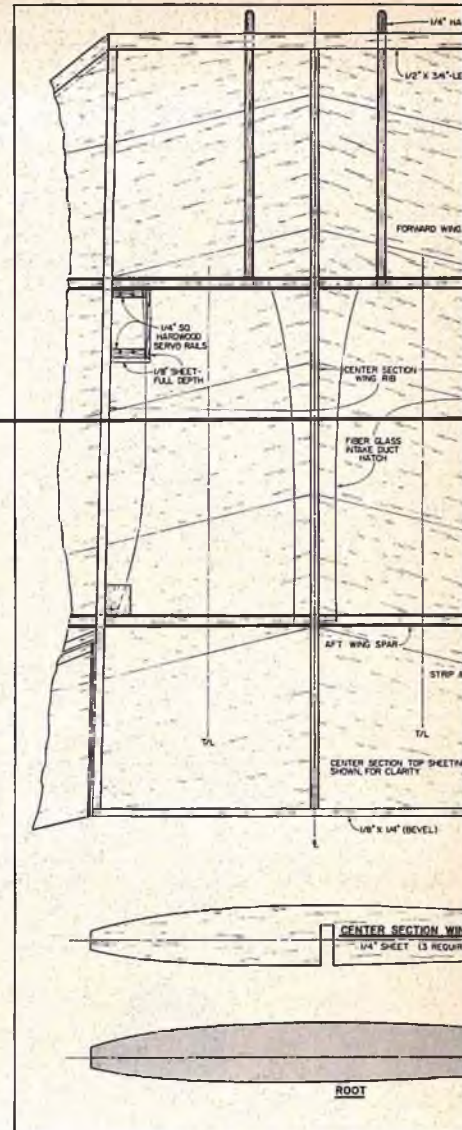
the tube epoxied to F12. The fin spars are epoxied to the upper fuselage crutch and the rear of F12. The stabilators should not be permanently installed until the model is ready for painting.

Scale Detail and Finish:

At this point the decision concerning color and markings should be made. I chose a pre-production A3J-1 as it appeared during flight tests in 1959-1960. The large areas of day-glo red paint make the model highly visible in the air. However, you may want to duplicate an A3J in squadron service. Several sources for scale information include: Air International, Vol. 9, No. 5, Nov. 1975, pp. 215-222; Airpower Vol. II, No. 1, Jan. 1981, pp. 12-23; Airprogress, Spring 1961 edition, pp. 20-21; Scale Aircraft Modelling, Vol. 4, No. 1, Oct. 1981, pp. 8-21; Famous Airplanes of the World, No. 121, Sept. 1980 (a KoKo Fan publication from Japan); also, write to manager, Public Relations, North American Aircraft Division, Columbus Plant, 4300 East Fifth Avenue, P.O. Box 1259, Columbus, Ohio 43216 for general arrangement drawings of the A3J. Plastic models also provide a wealth of information. The Advent Vigilante kit #3356 is highly recommended.

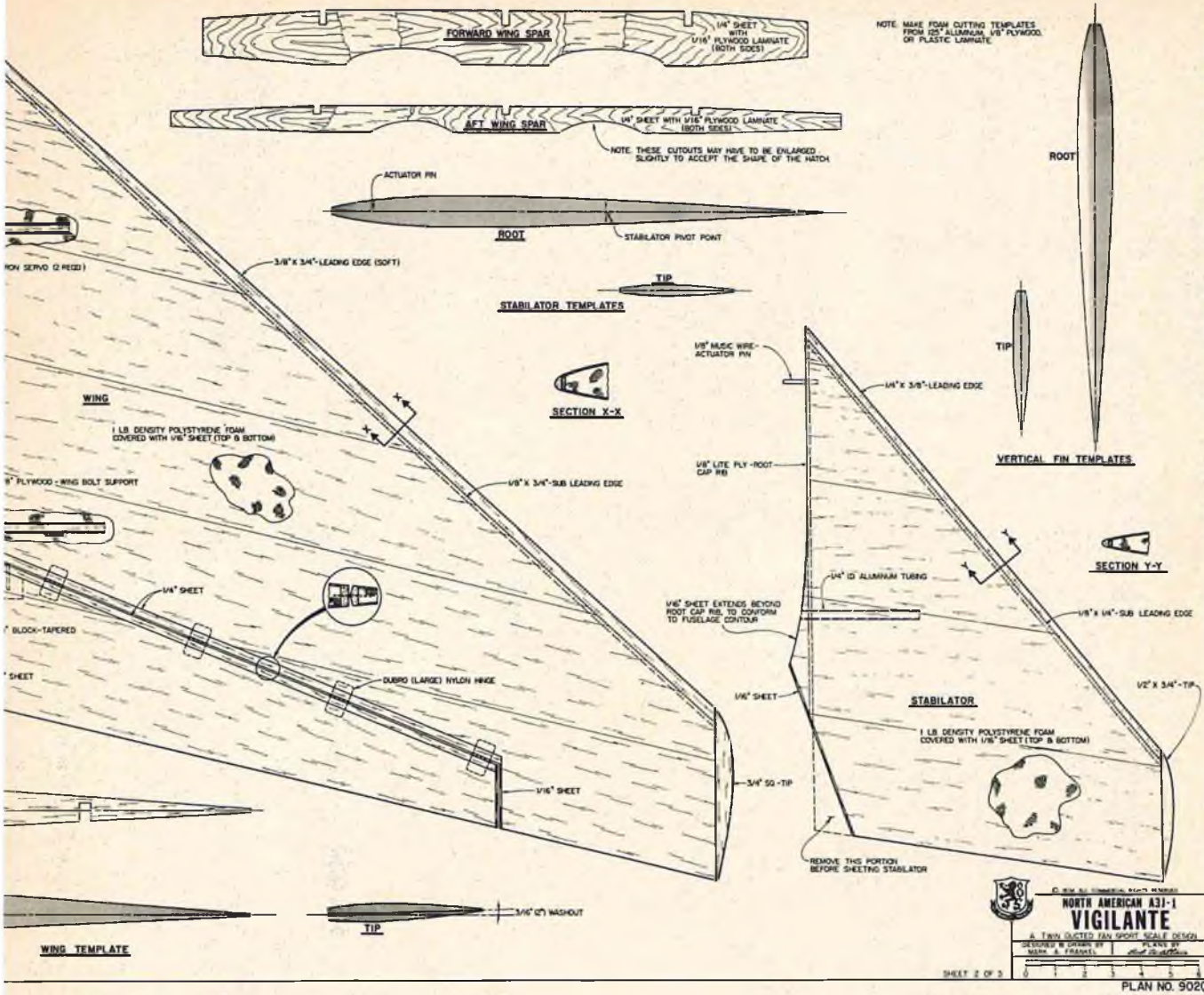
The model is prepared for painting by covering all wood surfaces with either paintable clear MonoKote, or 3/4 ounce glass cloth and polyester resin. The MonoKote is probably lighter, but it is far less durable than the cloth-resin technique.

Once all components are covered, the stabilators can be linked to the fuselage. Begin by cutting two hatches into the top fuselage skin to provide access to the stabilator bellcrank area. Slide the stabilators in place on the brass pivot, and mount the bellcranks so that they engage the actuator pin. Retain the actuator pin in the bellcrank slot with a 1/8" wheel collar.



Run a semi-flexible plastic pushrod from the stabilator servo area (between F7 and F8) to the bellcrank. Use two high torque servos (I used World Engine S-11's) connected to the receiver with a "Y" harness to actuate the stabilators. You should adjust the linkage to give approximately 3/4" movement up and down (total 1 1/2") at the stabilator leading edge. Replace the hatch cut-outs in the upper skin and continue with the finish.

Lightness is essential, therefore, a minimum of primer and color should be used. I used K & B Super Pox. The day-glo red, however, was Martin Senour automotive enamel (#7860) available at N.A.P.A. Auto Supply stores. The decals and military jet pilot were obtained from Jet Hangar Hobbies, 12554 Centralia Road, Lakewood, California 90715. Since the decals and day glo paint should be protected from the high nitro fuel typically used with jets, I misted a coat of flat Super Pox clear over the entire model.




NORTH AMERICAN A31-1
VIGILANTE
A TRIM-DUCTED FAN SPORT SCALE DESIGN
DESIGNED & DRAWN BY PLANS BY
WILLIAM A. FRANKEL JOHN J. GARDNER
 SHEET 2 OF 3 PLAN NO. 902C

Final Assembly:

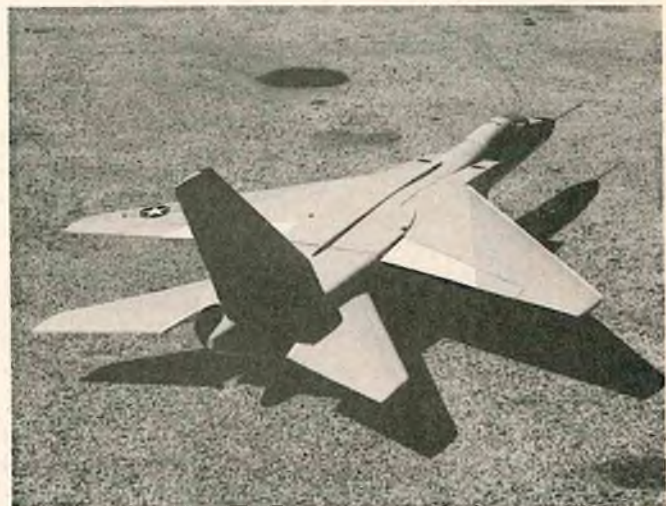
After the fan units are thoroughly bench tested (and preferably flown in another model) with the pipes tuned and idles set, they can be installed in

the Vigilante fuselage. I had my engines modified by Tom Cook, 304 Silvertop, Raymore, Missouri 64083 (of F4 Phantom Fame), who installed O.S. 61VF carburetors in place of the

Perrys that came with the K & B 7.5's. The O.S. carburetor provides about the same top end (22,500-23,000 rpm) but it allows a very reliable idle. After watching several video taped flights of



Assembled aircraft.



**Best Wishes ...
Joy and Peace
This Holiday Season!**



HB-ENGINES
Made in W. Germany

BAVARIAN PRECISION PRODUCTS CO. • P.O. Box 6, New Canaan, Connecticut 06840

the floor for access. The main landing gear doors, which are molded from two layers of 6 ounce glass cloth, are actuated by nylon fishing line which is routed through 1/16" I.D. aluminum tubing. When the main gear is extended, the nylon cord (which is attached to the upper part of the gear strut) holds the doors open. As the strut moves forward upon retraction, it pulls the doors shut. I haven't rigged a nose gear door yet. However, a similar arrangement could be used. The nose gear door, however, should be closed when the nose strut is extended and make a complete cycle as the strut retracts.

The radio system utilizes eight servos: one for nose wheel steering, one for retracts, two for ailerons, two for stabilizers, and two for throttles. All channels using two servos require a "Y" harness. Because of the large number of servos and their long distances from the receiver, a high capacity battery pack (1200 mah) should be used.

Probably the greatest problem in flying the Vigilante is dealing with the vibration set up by the twin fans at full throttle. I lost my second model, and damaged my current model during a contest, because a servo extension was severed by vibration.

to page 199

FACTORY DIRECT ONLY — DESIGNED BY JOE BRIDI

HIGHEST QUALITY KITS AVAILABLE, KITS CONTAIN Balsa, Plywood and some hardware. All parts accurately cut and packaged. TERRIFIC VALUES!!



KRAFTY "25"
DESIGNED AS A
TRAINER AND SPORT
FLYER
Wing Span 51 1/2"
Wing Area 460 Sq. In.
Engine 20-30

GLOW PLUGS

Idle bar glow-plugs for radial, 4 cycle and sport engines. LONG REACH ONLY. Glow-plugs for piped engines, gives better response and higher R.P.M. Also good for racing and duct fans. SHIPPING AND HANDLING: Add .50¢ per plug, or \$2.00 for 6 or more.

1-Ea. \$1.25 6-Ea. \$6.50 12-Ea. \$12.00

SHIPPING AND HANDLING: \$4.00 per kit
Foreign orders write for shipping cost. California Residents add 6% sales tax. Use Visa or MasterCard, personal check or money order, no C.O.D.'s. (Bank of America or MasterCard, designate)



MODEL AIRCRAFT DESIGNS, INC.

23625 Pineforest Lane
Harbor City, California 90710



AIRCRAISER "60"

60 SIZE BASIC TRAINER
A SEMI-SYMMETRICAL
AIRFOIL FOR ADVANCED
MANEUVERS
Wing Span 61 3/4"
Wing Area 720 Sq. In.
Engine 40-60



AIRCRAISER "25"

MIDWING BASIC TRAINER
TRULY A BEGINNERS
FIRST BASIC TRAINER
Wing Span 48"
Wing Area 430 Sq. In.
Engine 15-30



LOADSTAR "40"

TRAINER & SPORT
FLYER
Wing Span 72 3/4"
Wing Area 760 Sq. In.
Engine 25-60



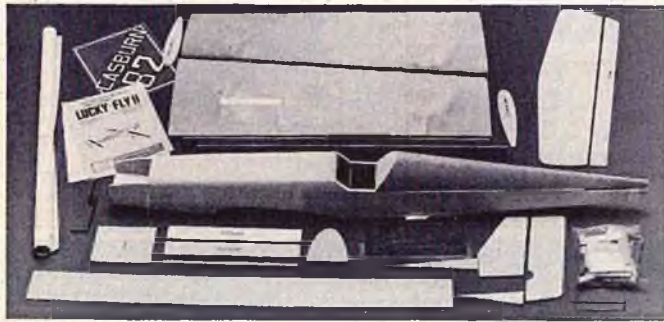
EZ-1

2 METER GLIDER
EASY BUILDING
AND FLYING
Wing Span 78 1/4"
Wing Area 544 Sq. In.
Est Flying Wt. 26 oz.



RCM PRODUCT REVIEW

Johnny Casburn, Mfg. SUPER LUCKY FLY II



Advertisements for Johnny Casburn Manufacturing have become more prevalent over the last few months, enticing the average modeler to purchase the Super Lucky Fly II in .40 and .60 sizes, the J.C. Trainers in .20, .40, and .60 sizes, the Minette, the Funett, the Super Tex, and the LFX VI pattern ship. All of these kits come ARF with 1/64 plywood sheeted foam wings and pre-aligned fuselages, showing a great deal of manufacturing and pre-assembly skills. The Super Lucky Fly II was ordered direct from the factory at a very reasonable price. In fact, two kits were ordered. UPS delivered the two 6" x 14" x 50" boxes the same week as the order; which says a lot for Casburn response to orders and UPS delivery. Both kits were packed with canopies carefully wrapped, the hardware bagged, and paper dunnage protecting the fuselage and wings. The most impressive attribute upon inspection of the kit was the ply covering of the wings and turtledeck. A single flaw appeared in the ply covering of the foam turtledeck on both kits. A crack occurred in the 1/4" radius at the rear of the turtledeck. The cracks were about 1 1/2" long. This is minor since the flaw is removed when the vertical fin slot is cut.

Construction:

Since the wings are foam and pre-covered, and the fuselage is pre-aligned, the assembly is quite fast. A full nine pages of instructions and a set of 38" x 76" rolled plans accompany the kit, far more than needed. The instructions

SPECIFICATIONS

Name	SUPER LUCKY FLY II
Aircraft Type	Sport/Pattern
Manufactured By	Johnny Casburn, Mfg. 5821 East Rosedale Fort Worth, Texas 76112
Mfg. Suggested Retail Price	\$89.95
Available From	Both Mfg. & Retail
Wingspan	62 Inches
Wing Chord	12 Inches
Total Wing Area	650 Sq. In.
Fuselage Length	53 Inches
Stabilizer Span	24 Inches
Total Stab Area	156 Sq. In.
Recommended Engine Range	50-75
Recommend Fuel Tank Size	12 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt., All.
Basic Materials Used In Construction:	
Fuselage	Balsa & Ply
Wing	Foam, Ply Covering
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (9 pages)
Construction Photos	No (Drawings)

RCM PROTOTYPE

Radio Used	Futaba 7FGK
Engine Make & Displacement	Webra .61 Speed
Tank Size Used	10 Oz.
Weight, Ready to Fly	116 Oz.
Wing Loading	26 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Ply wing sheeting. Pre-alignment of fuselage. Quick assembly.

WE DIDN'T LIKE THE:

Slight mismatch between plans and instructions.

are detailed and interspersed with pictorials to assist the novice builder. Casburn Manufacturing has apparently been revising their assembly techniques as the instructions did not match the plans or parts in some cases. Apparently the original kit included a wing brace that is no longer deemed necessary. One reference in the instructions was to "chrome coat," a term never before encountered. It was assumed that this reference was to the plywood wing sheeting. (*Editor's Note: Apparently our kits were minus an additional sheet of instructions that describes the new ply covered wings. This sheet is being included until such time the instructions can be redone.*)

A minor modification was made to the kit in the form of the addition of balsa block wing tips. The kit supplies a 1/4" wing tip block which allows the aileron to extend from the fuselage to the tip of the wing. We preferred to have the ailerons enclosed at the tips, hence the much larger wing tips blocks were added.

Two pages of the instructions, including drawings, are dedicated to the fitting and installation of the ailerons. These simplistic instructions ensure the novice builder of correct alignment and installation. It is reassuring to see a manufacturer provide such detail to the potential "first pattern flier." Many times instructions are directed to the expert / builder / flier which lets the novice builder/flier flounder.

The fuselage is pre-aligned and glued and only requires

to page 195



Designer and bird.

COMET RED RACER

A nostalgic classic
from the 1930's

They just haven't gone back far enough! The "Old Timer" modelers, with their ignition engines and ancient free flights, have created a fascinating class of R/C models. With a collector's item spinning the prop they've added radio

By Col. John A. deVries

control assist --- to keep from having to chase their late 30's free flights. But --- there was a time, before Maxwell Bassett cleaned up the Nats with an internal combustion engine, when

99% of all model airplanes were powered with rubber bands! Oh, there were a few "giant" models propelled by compressed air "engines" and a few with CO₂ power plants. However, most kids growing up in the Depression days relied on the kit

Given with each \$1 and \$1.50 kit! Each kit in each Group packed in snappy "Gift" Box. HURRY! ORDER your "Gift Group" Now--and save money!

See Free Cement Offer On Other Side of This Page Before You Order--Then Order On Coupon Below!

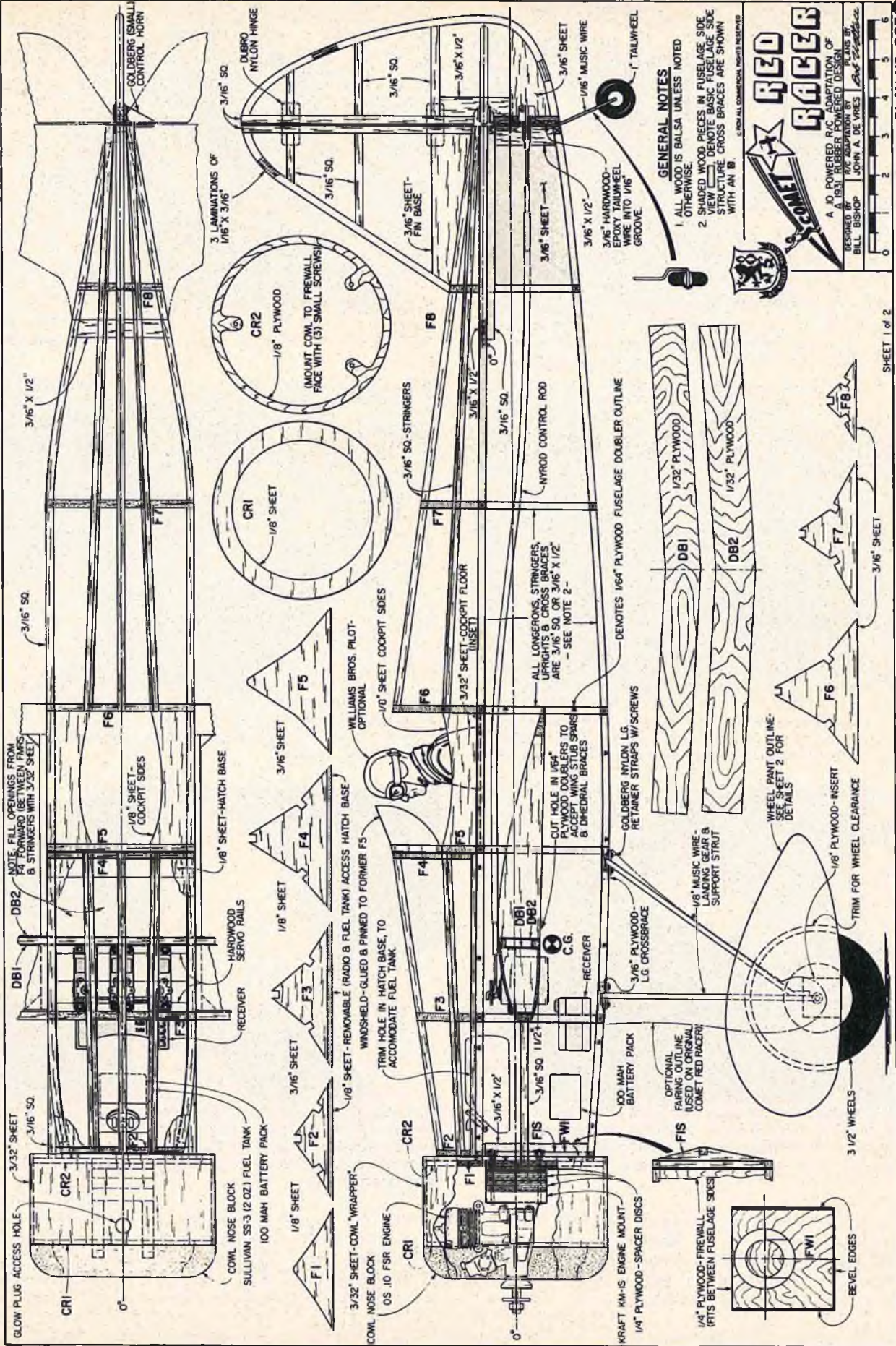
New, Fast RED RACER!

We're selling thousands of this new, original, exclusive Comet-designed Red Racer! "Speed" all over it! See that actual color photo! You can't resist those beautiful lines, the glorious appearance--and Comet FLY-ABILITY! Special Comet Insignia, too! EASILY BUILT! Jet-black cell, wheels, flaming red colored body, wings! Your Red Racer is waiting for you in brilliantly colored box, with Free Glider, Free Cell, "prop"--all for only \$1 prepaid! Quick, order!

\$1
Prepaid
or at
DEALER'S

COMET Model Airplane & Supply Co.

Detail from December, 1932 Comet Model Co. advertisement --- showing enlarged portion dealing with the original, rubber powered Red Racer.



GENERAL NOTES

- 1 ALL WOOD IS BALSA UNLESS NOTED OTHERWISE.
- 2 SHADED WOOD PIECES IN FUSELAGE SIDE VIEW DENOTE BASIC FUSELAGE SIDE STRUCTURE. CROSS BRACES ARE SHOWN WITH AN 'B'.

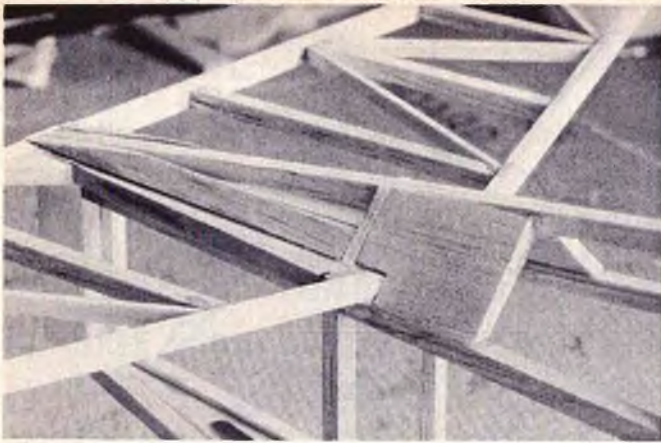
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RED RACER

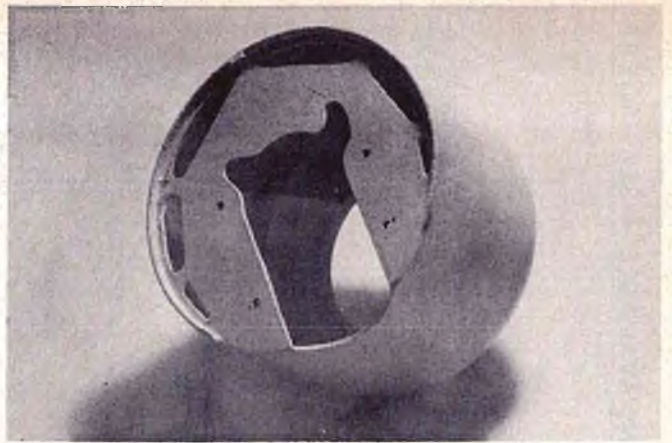
A 10 POWERED P/C ADAPTATION OF
A 1931 RUBBER POWERED DESIGN
DESIGNED BY JOHN A. DE VRIES
BILL BISHOP

PLAN NO. 9030

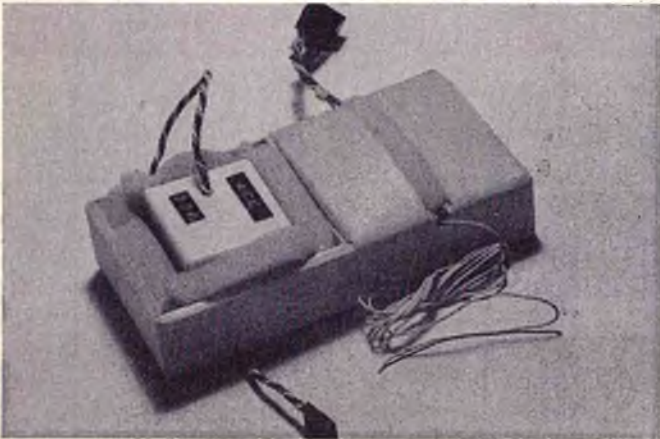
SHEET 1 of 2



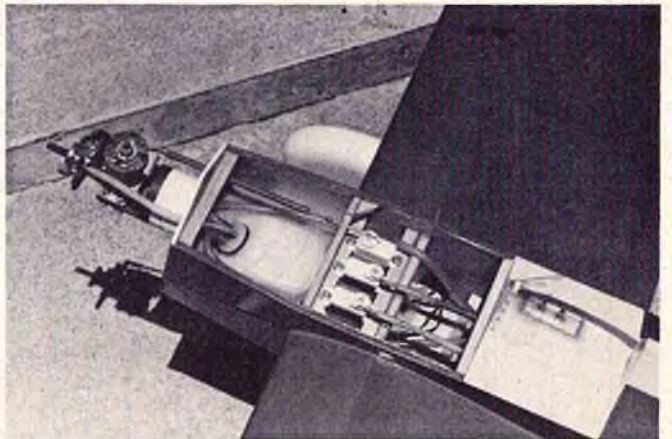
Red Racer R/C tail construction detail. Since the model is covered, assembled, MonoKote attachment strips are needed below the rudder. Note that the stab fairing has yet to be added.



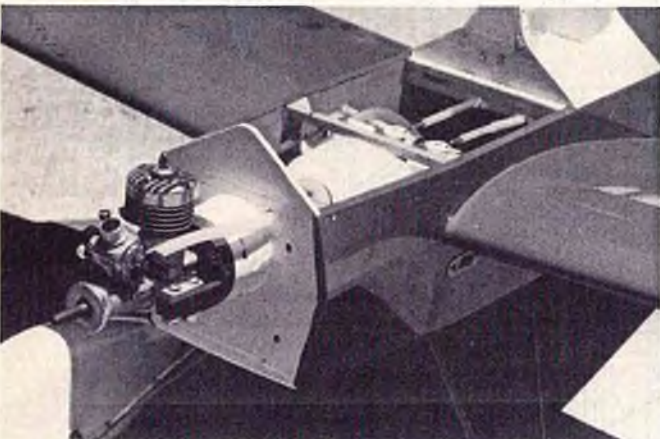
Rear view of the Red Racer's cowling. Angular section duplicates the fuselage firewall --- the plywood cowl mount.



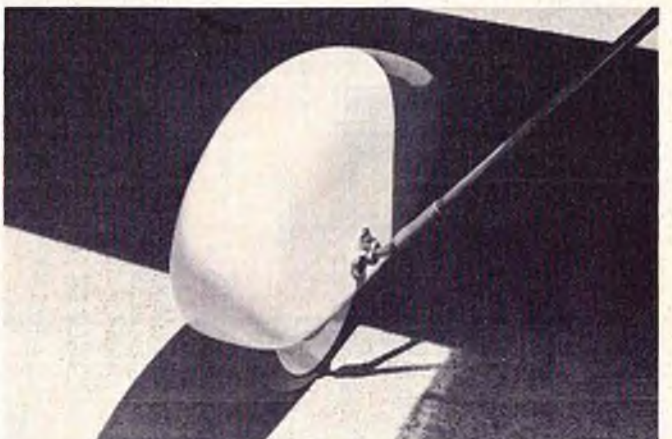
Radio tray for the Red Racer --- the balsa box holds the tiny Cannon 5 channel receiver and an Ace 250 mah battery. Everything's wrapped in foam to keep it from rattling around in the fuselage. Plenty of room underneath the servos for the radio box!



Lotsa room for the teeny tiny Cannon micro servos ahead of the wing spar. Home-made tank replaced by 2-3 oz. Sullivan "bubble" tank. Extra plumbing allows for positioning of fuel filler tubes inside "cockpit."



Front of Red Racer R/C fuselage with cowling and upper hatch removed. Note the plywood discs, used to moved the engine and its mount so that prop clears the front of the cowl. Also, note that the outer Nyrods are epoxied to the structure.



Close-up of Red Racer R/C wheel pant attachment --- a Fox flanged wheel collar. Axle projects through the wheel pant --- thus the single wheel collar retains both the wheel pant and the wheel. Also, look closely and see the outline of the 1/8" plywood wheel pant insert.

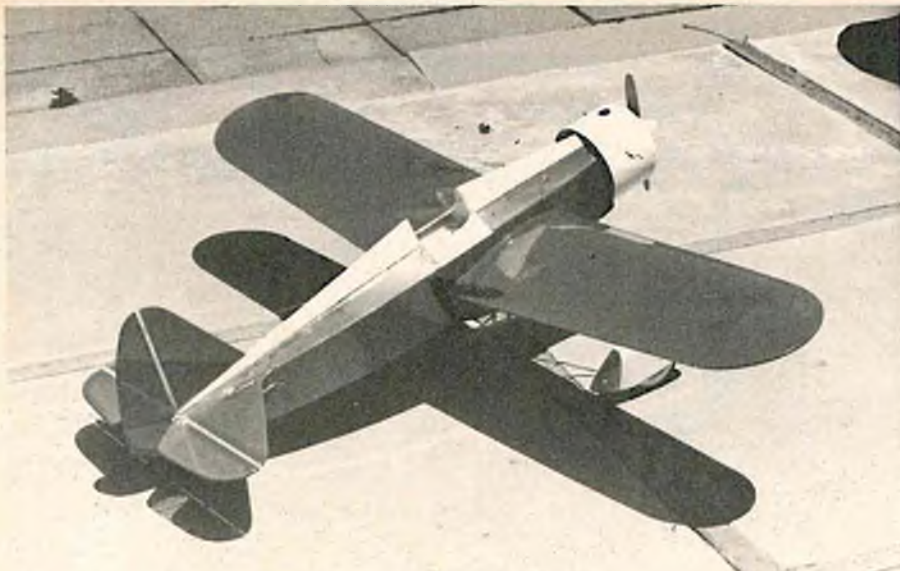
manufacturers to produce models that flew. And --- those kits cost 10¢. Most of us were scandalized when one of our favorite kit companies produced the "Red Racer" --- and charged a whole dollar!

Bill Bishop, then President of

Comet Models, knew what he was doing. In 1931, he designed the Red Racer --- and the kit was worth the price! That the model was a "good flier" was never in doubt. The kit was in production from 1932 until the balsa shortage of World War II

stopped kit manufacture! Its twelve year run suggested something new and different in the way of "Old-Time R/C" to us. Why not adapt an old time rubber powered design to R/C --- specifically, the Red Racer.

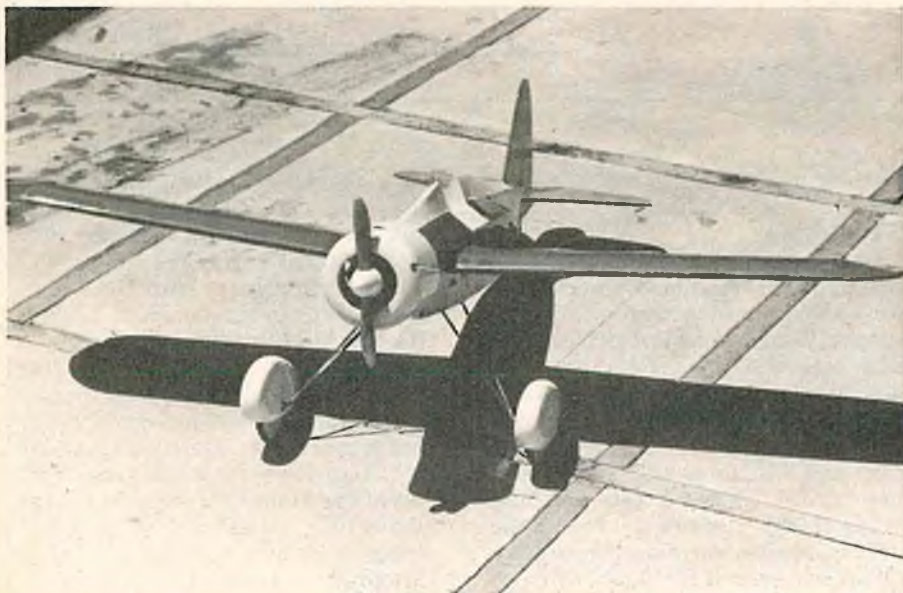
In its original form, the Comet Red



de Vries' MonoKoted Red Racer R/C. All-up weight, ready to fly is only 23 oz. No special effort was made to keep the model light, except for the use of laminated balsa curved pieces in the wing and the tail structure. Except for the strengthening that R/C and engine power required, Bill Bishop's original design was followed as closely as possible.

Racer had a span of 15½" --- much too small for R/C. But, enlarged three times, it is an ideal model for the new teeny-tiny radios and .10 R/C engines. While we were on the nostalgia "trip," we decided to duplicate the construction of Bill Bishop's design as far as was humanly possible. 'Course we had to make some compromises (for instance, 1/64th ply fuselage doublers) to strengthen the structure

for powered flight. Then, too, there are few modelers who retain the skill to bend curved bamboo wing tips around 100-watt light bulbs. So --- we substituted laminated balsa tips and the tail feathers' curved parts. Mr. Bishop's airfoil section resembled a Clark "Y," so we computer plotted a set of ribs, in the same number shown on the Comet drawings (which we acquired from John Pond's Plan



Red Racer R/C, looking just like its rubber-powered "ancestor." New version is 3X, giving it a 46½" span. An eight inch, 3½" pitch prop, turned by an O.S. .10 Schnuerle engine powers the Red Racer R/C. Note the long brass tubing extension for the needle valve, through the cowling. And, the hole for the glow plug wire attachment, in the top of the cowling.

Service). Col. Hurst Bowers (Herb Clukey's former partner in Flyline Models) doubled the number of wing ribs in the Red Racer he built from our prints. But, he covered his model with silk (in keeping with the era of the model) so he needed the extra strength.

Built as shown in our drawings, our MonoKoted Red Racer, lacking only the radio installation, weighed 19 ounces! It seemed like a good excuse to acquire one of the Cannon Micro radio sets. So, our bird, ready to fly, scales in at less than 23 oz. We're only using three of the Cannon servos --- and they're "lost" in the Red Racer's fuselage. Hurst, too, used a Cannon radio but there's ample room for many of the small servos on the market, for example, Kraft 12's and 18's, Ace's smallest, and Royal Products' Mini-Titans (all of which we've test-fitted to the drawings).

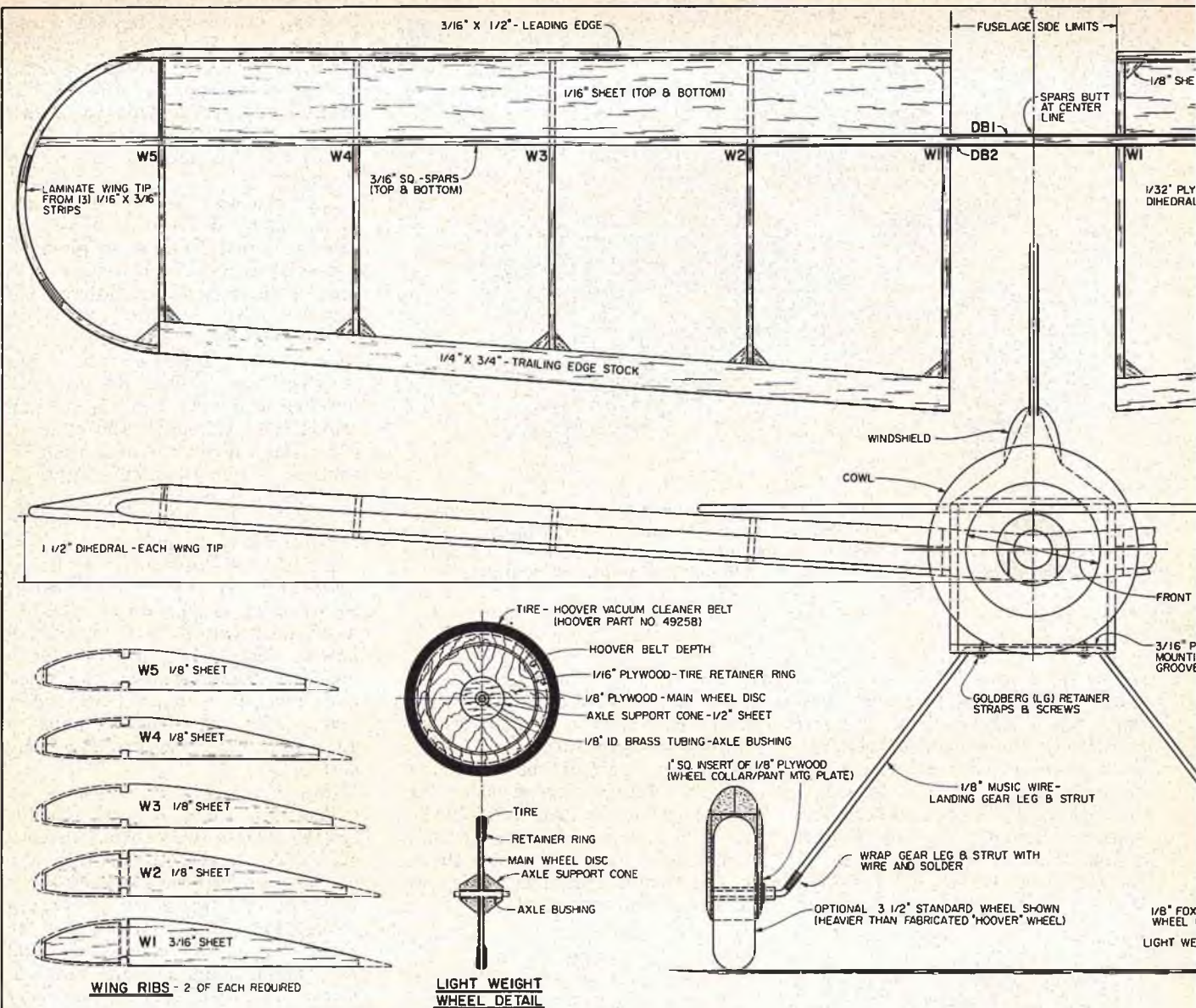
Since we're duplicating a rubber powered model of the 30's, construction is dead-on simple. We won't bore you with an extensive how-to description, nor include a bunch of redundant photos of a "stick and stringer" model. What follows covers a few suggestions and tips to simplify your construction of the design.

Wing:

The wing is built around a D-tube spar system, in two panels. The spar stubs are inserted through the fuselage, so it's a good idea to build the wing panels first. We purposely positioned the wing spar at 25% of the chord --- where the completed model will balance. Laminate the tips, add leading and trailing edges but don't glue the root ribs in place until the rest of the structure has "dried." Prop up the panels to the proper dihedral angle (1½" under each tip) and then epoxy the root rib(s) in place, perpendicular to the work surface.

Fuselage:

Construct a right and left fuselage side and then glue the 1/64" ply doublers in place. Very carefully locate and cut out the wing spar openings through the doublers, before adding the fuselage crosspieces. Note that the formers, forward of the cockpit, are doubled to provide a hatch for access to the radio and the fuel tank. The base of the hatch is a rectangle of 1/8" sheet balsa and the forward, upper fuselage, between stringers is inset with 1/8" balsa. The hatch is retained between the "instrument panel" former and the cowling. You can "pin" it in place with some 1/8" dowel if you wish. Balsa sheet is also inset at the rear of the fuselage to support the rudder and



elevator Nyrods.

Tail Feathers:

Laminate the curved portions and build the rudder and stabilizer flat on the workboard. Sand and hinge the stab/elevator and epoxy them in place atop the rear fuselage **before** adding the rear, upper stringer. Sand, hinge, and glue the fin to the top of the upper stringer.

Landing Gear:

Bend the struts to the patterns shown on the drawings. Solder the lower ends together with copper wire binding. Note that the plywood gear mounts were included as crosspieces in the bottom of the fuselage. The strut assembly is held in place with nylon gear straps. The model won't look like a Red Racer unless you duplicate the wheel pants from laminated sheets of balsa. We inset 1/8" plywood squares at the axle location in the pant sides so

we could use Fox flanged wheel collars to mount the gear fairings.

Wheels:

Of course, the Red Racer could use commercially available wheels, but we chose to make 'em --- to save weight. With thanks to Tex Newman, who designed the "Dragonfly," we used his Hoover vacuum cleaner-tired wheels on the Red Racer. The wheels have a plywood core with plywood rims and a doubled 1/2" sheet balsa conical hub. A brass tube bushing keeps things running true and the tires are Hoover vacuum cleaner drive belts (Hoover part No. 49258) slipped in place after the wheels are painted.

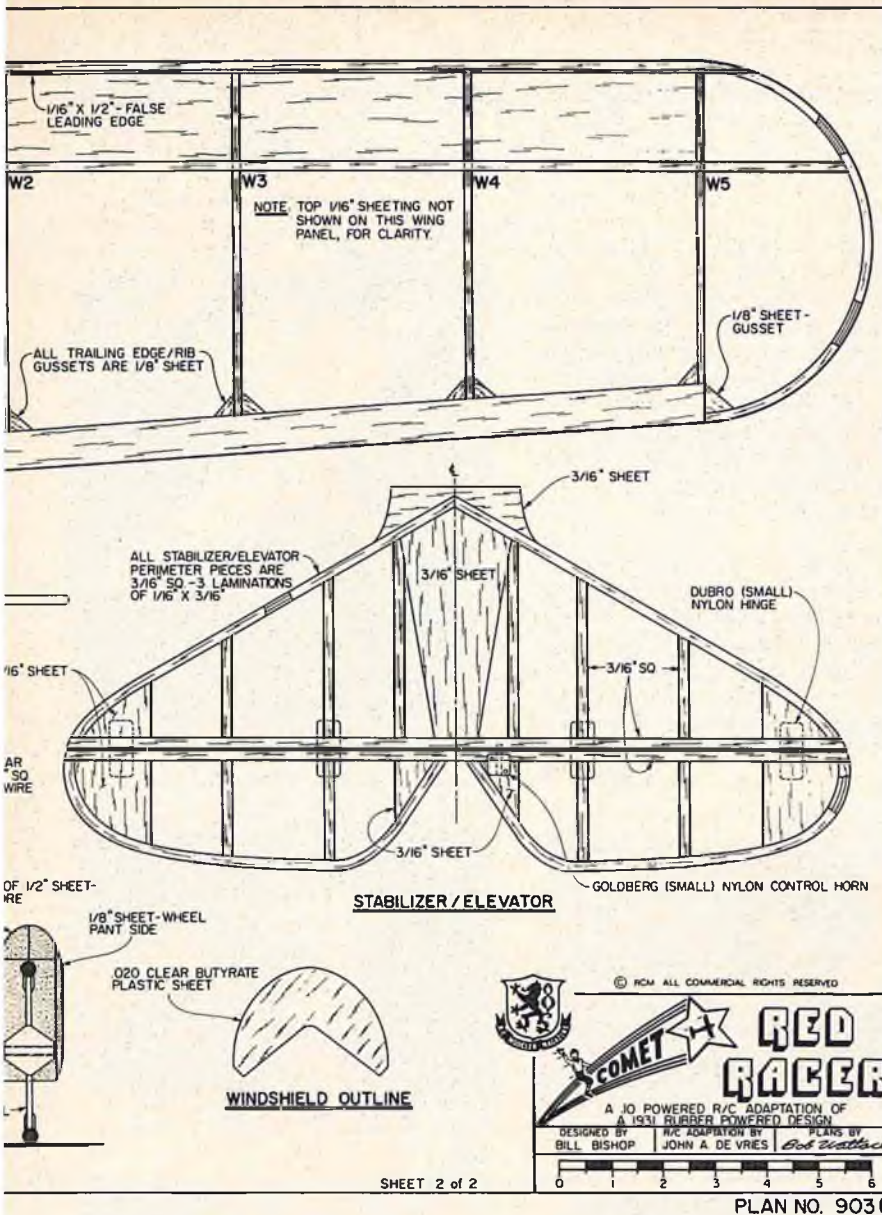
Assembly:

Although it makes covering the Red Racer a tad more difficult, we glued it all together before applying the MonoKote to the fuselage top and bottom and to the tail surfaces. So ---

cover the wings and the sides of the fuselage, trimming the MonoKote away from the wing-fuselage glue area. Prop up the fuselage, solidly, and slip the stub spars into the holes. Apply epoxy to the inside of the root ribs and block up the wing panels to the proper dihedral angle. When the epoxy has set, epoxy the spar joiners to the stubs, inside the fuselage. If you've cut the spar slots correctly, you'll have 1 1/2° of positive wing incidence. The rest of the MonoKote is applied after adding the "covering strips" to the stringers of the aft fuselage.

Cowling:

We "turned" the front of the cowling, using a 1/4" power drill and sandpaper --- cutting the hole in its front later. The cowl front and the rear mounting plywood "plates" were spaced with four lengths of 1/4" square balsa strips and then the 1/16" sheet



SHEET 2 of 2

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RED RACER

A JO POWERED R/C ADAPTATION OF A 1931 RUBBER POWERED DESIGN

DESIGNED BY BILL BISHOP R/C ADAPTATION BY JOHN A. DE VRIES PLANS BY Bob Wallace

0 1 2 3 4 5 6

PLAN NO. 903 ©

COMET RED RACER R/C

Designed By.
Col. John A. deVries
TYPE AIRCRAFT
Sport Old Timer
WINGSPAN
46½ Inches
WING CHORD
7½ In. (Avg.)
TOTAL WING AREA
318 Sq. In. (Approx.)
WING LOCATION
Shoulder Wing
AIRFOIL
Clark Y 12%
WING PLANFORM
Double Taper
DIHEDRAL EACH TIP
1½"

O.A. FUSELAGE LENGTH
33"
RADIO COMPARTMENT SIZE
(L) 4" X (W) 3½" X (H) 3½"
STABILIZER SPAN
15 Inches
STABILIZER CHORD (incl. elev.)
5" (Avg.)
STABILIZER AREA
71 Sq. In. (Approx.)
STAB. AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
8¼ Inches
VERTICAL FIN WIDTH (incl. rud.)
5½" (Avg.)
REC. ENGINE SIZE
.10 Cu. In.
FUEL TANK SIZE
2-3 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa, & Ply,
Empennage	Balsa
Wt. Ready To Fly	23 Oz.
Wing Loading	10.4 Oz./Sq. Ft.

"wrapper" was "Hot Stuffed" in place. Epoxy and strips of fiberglass cloth reinforced the cowl/plywood mounting plate joint. In order to position the engine so that the prop drive washer was in front of the cowling, we "turned" some 1/4" plywood circles to which the Kraft engine mount was bolted. The cowl was mounted, using the system shown in our article in the June, 1982 issue of RCM ("Dead Center"). Our engine is an O.S. .10 Schnuerle, but engines of lesser potency can be used. Given the finished weight of the model and its feathered light wing loading, a "hot" .049 might fly the bird at sea level, although that's a bit of conjecture (Bowers used an .06 "hummer").

Finishing Touches:

As you'll see in the photos, we mounted the servos ahead of the wing spar, with the flight battery and

receiver in a padded box beneath 'em. We used semi-flexible Nyrods to push the tail surfaces and a cable throttle "pushrod." For the lightest possible model, thin cables to the tail feathers would be the way to go (and have the proper, "old-timey" look!).

There is not a lot of room, ahead of the wing spar, for a fuel tank. We used an old plastic bottle with Sullivan fuel tank hardware that fit the space, but a 2 to 3 ounce will fit also. We made some strut fairings out of file-folder stock (strictly for looks) but left 'em off. We were afraid of the effects of the fairings when we flew the bird.

Flying:

We were happy just to make sure that the Red Racer would fly. With the stalky landing gear, taxiing the Red Racer is a chore, even though we have a steerable tail wheel. Lined up for take-off, however, the Red Racer is off

the ground almost before it begins to roll. It's a neat little sport ship to putt-putt around the field on a Sunday afternoon. Not "darty" like many other small R/C models, the Red Racer retains its stability with a minimum amount of interference by the flier. With its 10 oz. wing loading, it is a calm-wind model and floats a tad on the landing approach.

Which leaves us with a couple of questions. Are R/C rubber powered designs of the 30's "Old Timers" within the spirit and intent of the Old Timer movement? And --- would you be interested in an R/C model of the Comet "Dipper?" Just happen to have "done" one! □

FLYING LOWE

Don Lowe

Greetings from Israel! That may sound strange, but since I last wrote, life for me has been interesting and varied. At the moment I am in Tel-Aviv on business related to an RPV consulting project. Hopefully while I'm here I'll be able to sample the modeling activity and report on that.

In the few days that I have been here, I have found it fascinating, especially the friendly gregarious people, who seem to be a melting pot mixture from all over the world. One only has to walk the streets and witness the great variety of shops and restaurants in terms of national origin. So far, I have dined in Rumanian, Russian and Turkish restaurants. Most fascinating of all has been the tremendous throngs of

people day and night along the beaches on the shores of the Mediterranean. On Friday and Saturday, the beaches were literally teeming with people. Saturday night witnessed a gathering along the shores and promenades which was amazing to me. It seems as though the whole population turns out to socialize and enjoy the evening breezes off the Mediterranean.

Noise:

Last time we discussed some activity of mine designed to meet the engine noise limitations being imposed at the Masters team selection competition in June at Rough River, Kentucky, State Park. For me, the Masters was a disaster, since I crashed my best Phoenix the week before the

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Greg Marsden of Hamilton, Ontario. 1st place winner Masters Canadian Nats. Phoenix 8 with 3-blade Weller prop.



Henry Piorun all the way from Victoria at Canadian Nats. Aircraft "Equinox" with 3-blade prop.



Martin LeFebvre and conventional gear Phoenix 8 at Canadian Nats.



Lorn Kilmchuk of Yorkton, Sask., and T-tail "Thunderbolt" at Nats. It was very fast.



Some of the pattern ships at the Canadian Nats.



Chuck Shade (left) and home-made wing incidence meter. Extremely accurate using "plumb bob" angle measurement.

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RADIO SPECTRUM

Jim Oddino



Dual Conversion Receivers

Never thought I'd be flying on 72 MHz at Sepulveda Basin. I've been flying on 53.1 MHz for so long, without any problems, that there never was any reason to try anything else.

So why try 72 MHz now? Well, Jack Albrecht of Kraft Systems asked me to take a look at their new KPR-8FD dual conversion receiver. I considered this an excellent opportunity to get a first hand look at a dual conversion receiver, something I had never done before. Kraft Systems has produced a series of dual conversion receivers, and I know EK had one for a few years but I don't think any other manufacturers have tried it. The big advantage of dual conversion is the image rejection capability.

Let's take a minute and define image rejection. Mixers used in superhet receivers mix the incoming RF frequency with the local oscillator frequency generated in the receiver. The local oscillator frequency is off-set from the RF frequency by the intermediate frequency. In R/C receivers, this IF is usually 455 KHz just as it is in AM broadcast band receivers. So let us assume that we want to operate on 72.08 MHz. Our local oscillator would be set at 72.535 (72.08 + .455) or at 71.625 (72.08 - .455). Let's assume the designer picked 72.535. Now let's see what happens if a transmitter on 72.99 mixes with our local oscillator. 72.99-72.535 equals 455 KHz which goes booming through the IF filters. This frequency, 72.99, is the image frequency of our receiver. The tuned RF circuits in front of the mixer attenuate (reduce) the image frequency amplitude some but not enough. So you want to make sure no one is on your image frequency.

There is no R/C frequency at 72.99 but there is one at 72.96. You say, no problem — that is 30 KHz away and the bandwidth of my receiver is 3 KHz. Wrong! First of all, quit thinking in terms of your transmitter putting out one frequency. Instead, think of it putting out a number of frequencies closely spaced around 72.08. The same is true of the guy flying on 72.96. In fact, it puts out some energy, admittedly reduced at frequencies quite a distance from 72.99, including 72.96. On the receiver end we find that the 3 KHz spec is for the 3 db point (half response) but the receiver still

responds to signals beyond that band especially when it receives a strong signal (typical of receivers using tuned IF cans but not those with ceramic filters.) The net result is if you get your airplane quite a distance from your transmitter and very close to the 72.96 transmitter (such as might occur at a contest with flight lines spaced 200 feet apart), you will probably learn about images real quick. And lots of people have.

The dual conversion receiver eliminates this problem by putting the first intermediate frequency at 10.7 MHz. The image frequency is now 21.4 MHz away from the desired frequency and is easily rejected by the tuned circuits in front of the mixer.

Somebody out there is asking, "Why didn't the single conversion receiver use a 10.7 MHz IF? The answer is that 10.7 MHz IF cans (filters) are not selective enough. The bandwidth, assuming similar IF cans, would be roughly 20 times wider. So the dual conversion receiver sends the 10.7 MHz signal to a second mixer which converts the signal down to 455 KHz. It is effectively two receivers in series.

Now it is possible to build a single conversion receiver using an IF of 10.7 MHz if one uses crystal filters instead of the usual IF cans. I wouldn't be surprised to see someone try this approach but it isn't an easy design

job.

What about intermodulation, the other "problem" we're hearing about the new frequencies? This problem is anticipated when you get RF frequencies 455 KHz apart. I think I've mentioned before that I don't think this will be a problem, I know guys have been doing this on six meters and getting away with it. However, I don't know if a situation like I mentioned before, that is transmitters 200 ft. apart, wouldn't cause IM problems. The dual conversion receiver should alleviate this problem too.

Finally, we would like a receiver to work with an adjacent transmitter 20 KHz away and even 10 KHz away if possible.

There has been a lot of talk about narrow band receivers being required to do this. I think modelers will find that many existing receivers with conventional IF cans will work under many conditions in which we fly, but there might be some condition when even the narrow band receiver will get interference. There is always some point where you will have a problem if the interfering signal gets large enough compared to the desired signal. However, I suspect that receivers like the Kraft dual

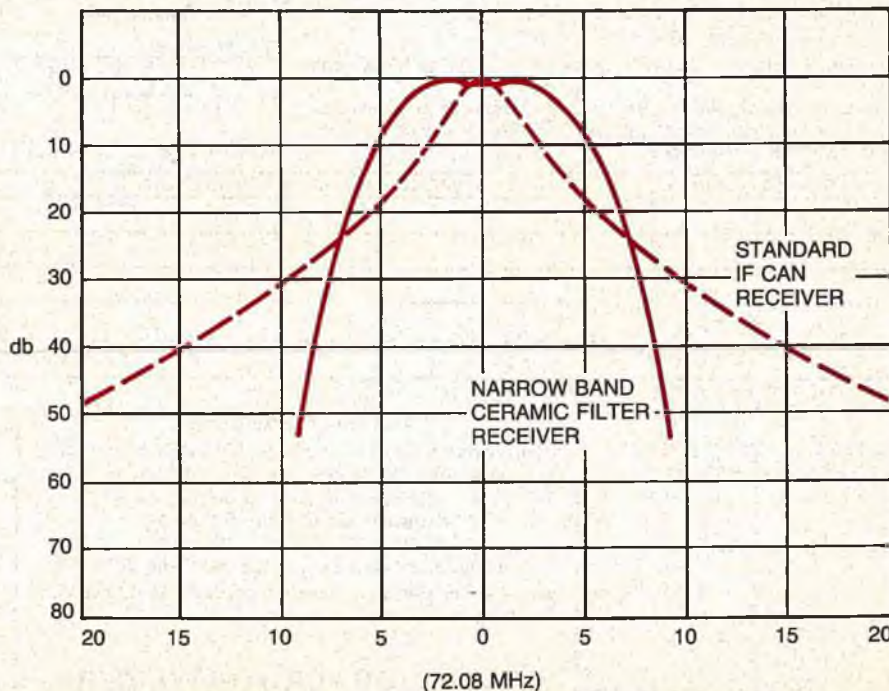


FIGURE 1

LOOKING FOR A SPECIAL GIFT FOR THE RC'ER IN YOUR LIFE? Or, Something Different For Trophy And Awards Ceremonies . . .

RCM introduces The Baron Collection of stoneware plaques, originally designed and created exclusively for RCM by Artist Fran Baron. Each plaque measures approximately 9" x 11" and is made from a precisely detailed mold from the original. These satirical, yet authentically detailed 3-dimensional plaques are individually hand-painted creating a unique work of art suitable for any R/C occasion. The two designs offered at this time are the Fokker DVII and the Travel Air A-4000 and are priced at \$25.00 each postpaid in U.S. California residents add 6% sales tax (L.A. County 6½%).



Mail To: R/C Modeler Magazine
P.O. Box 487, Sierra Madre, CA 91024



Name _____

Address _____

City _____

State _____ Zip _____

PLEASE SEND:

Fokker DVII Plaque

Travel Air A-4000 Plaque

Total Payment Enclosed \$ _____

M.C. or Visa # _____

Expiration Date _____

Signature _____

Foreign orders, please
write for additional postage info.

conversion will not ever be expected to work under those conditions. By the way, it is not the dual conversion that makes the 10 KHz separation feasible, but the ceramic IF filters. They actually have a wider 3 db bandwidth than the IF cans but have much steeper skirts and, therefore, much better rejection at frequencies greater than 10 KHz. See Figure 1.

So what about the Kraft KPR-8FD? I have to agree that in theory it will take care of all the "problems" anticipated with the new frequencies; that is, image, intermodulation and 20 KHz spacing with other R/C channels and 10 KHz spacing with other users.

If I were going to continue to fly on 72 MHz, I would definitely get on one of the new frequencies which are exclusive to R/C and I would either get a dual conversion receiver or select my frequency very carefully so I would never have to fly with anyone near my image frequency. That doesn't mean your present equipment won't work, but the dual conversion will work where others won't.

In addition to being dual conversion and narrow band, the KPR-8FD receiver includes a voltage regulator which will assure constant sensitivity even though the voltage drops. I guess I haven't mentioned that it is an FM

receiver which means you need an FM transmitter module to go with it, but as far as I'm concerned, this is the only way to go. I've mentioned many times that I feel the FM systems are better. I'm surprised they haven't caught on faster on six meters. Now that they are available on 72 MHz, I suspect there will be a big increase in FM use.

The receiver uses a Siemens SO41 integrated circuit which provides the IF amplifier stages, the limiter, and the FM discriminator. I was a little disappointed that they didn't use the Siemens SO42 balanced mixer but I know it is not easy to get 72 MHz

to page 182

COLUMBIA MODEL CRAFTS FOR THE MODELER WHO ISN'T SATISFIED WITH GIMMICKY READY-TO-FLY



TRAIN-AIR

Super Kaos .60, low wing, 58" \$329.95
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Dalotel, semi-kit, glass & foam
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This is our fourth year of producing hand built aircraft for modelers who appreciate classic quality. Airframes are built-up, jig aligned, and professionally finished in Super Monokote. Installed hardware/accessories are top quality brand names as are our superb balsa and hardwoods.

There are absolutely no other RTF's that offer CMC's quality and features: American-made airplanes that fly easily and predictably and when necessary, are easily repaired. When questions arise, call us and speak directly to the builders! At CMC, Ready-to-Fly R/C airplanes are our only product. See your dealer or order direct.

Installed engines and radio systems are available;
all models are 4 channel.
* We also do custom building *



Columbia Model Crafts

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IMAA FUN FLY FESTIVAL '83



My acquaintance with Ida Grove, Iowa, consists of a few days in two successive years, 1982 and 1983. Bringing almost 10,000 people into Ida Grove, a city of about 2500, makes for a situation which can only be described as bursting at the seams.

There were over 350 registered model pilots, although I do not believe that they all had flyable airplanes there. Quite a number of full scale aircraft were also present and put on a sparkling display for those attending. The high point of the full scale flying would have to have been the U.S. Navy's Blue Angels. The speed and power of jet aircraft, which we rarely see so close to the ground, brings the hair up on the back of one's neck. When an afterburner is cut in and several tons of flying machine make

like a turned on sky-rocket, well, it's just got to be impressive.

Among other full scale aircraft present and doing brief fly-bys for the spectators were a TBM Avenger, two F4U Corsairs, two P-40's, a T-28, two AT-6's and an AD-6. Watching a P-40 and a Corsair on a fly past doing slow rolls is a sight not common these days and one which was repeated several times to the great enjoyment of those present — especially the modelers. It's not often you get a chance to see how your giant should perform such maneuvers to be realistic. The slow roll rate of the P-40 is surprising and it just might be a good idea if scale judges were required to see a few such demonstrations in order to improve their judging as to what is realistic and what isn't!

One sight that is equally stirring is the Christen Eagle team of Charlie Hilliard, Gene Soucy and Tom Poberezny displaying the expertise that has made them the internationally renowned aerobatic team they are. A thousand pound airplane with 260 ponies up front can really turn on in the hands of such experts and they amazed us with their performance.

However, the real reason for going to Iowa was to see what's happening in the world of Giant models and they, too, were there in force. There must have been at least one of everything available and several of some of them. Cubs and Pitts, P-51's and Fleets, were common and many were flown. Bob Nelitz was there flying his impeccable 1/3 scale Cub in his usual impeccable manner. Walt Mocha was present with Balsa USA's Der Jaeger introduced at Toledo in April, and it's not only a great looking fun machine, but it flies very well indeed. Some of that may be due to Walt's skill, but he told me it had no bad habits and I must say it looked good, both on the ground and in the air.

Bob Campbell of R/C Kits had his

**Text By Dick Phillips
Photos By Jerry Smith**

B-29 there along with his, as-yet unflown C-130 Hercules. The B-29 is an impressive bird and may be seen in the recently released movie "The Right Stuff." It won't, however, be seen elsewhere as it appeared to have been experiencing some radio problems and crashed at Ida Grove. The crash occurred well clear of the crowd and the accident points up once more, if it's necessary, that safety is a consideration which cannot be neglected even for a moment.

I had the chance to see Tony Bonetti fly his Circus-Circus Laser several times on the Webra Bully engine. We kidded Tony about flying electric power as the Bully was particularly well-muffled and, at any distance, could not be heard at all. Several of us thought it a bit too quiet and it was certainly well-below any other model there as far as noise level is concerned.

Byron's staff flew many of their models in short demonstrations. For those who have not seen the ducted fan aircraft fly, they are most impressive and the Byron's crew fly them with a good deal of skill and style. I saw the new Beechcraft Staggerwing fly several times and found it a very impressive model — it's a beauty. It isn't out yet but there was evidence of production on the Byron's factory tour at Ida Grove. Those of us who have been waiting for it shouldn't have too much longer to wait.

They also had a real newcomer ready to fly although it was

text to page 179



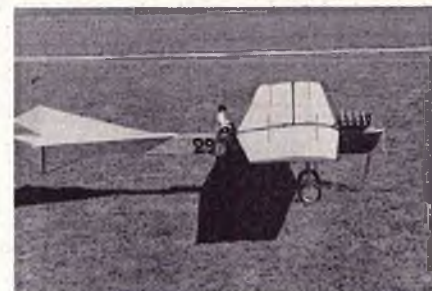
Ray Mead — Eagle Grove, Iowa, cranks up his Byron P-51. Ray is a Byron Show Team pilot.



Walt Mocha — Balsa USA — and latest kit "Der Jager DIX". Wingspan 80", wt. 21½ lbs., Quadra 35cc or 50cc. Kit is \$124.95.



Don Harris encounters trouble under the cowl. Airplane is Don's Half Breed.



Jack Fortney's 1909 Antonette on take-off. O.S. .60 4 cycle for power, 10 lbs. all-up weight.



General flightline shot during busy flying session.



Prototype of Byron Originals' new P-47D. Fiberglass fuselage and foam wings and tail. To be released soon.



Hazel Sig's Clipped Wing Cub and model. Hazel flew in — the big one, that is.



Hazel holds while Maxy cranks. You bet, Maxy still files great.



Great looking Balsa USA Sopwith Pup by Gary Bussell of Muncie, Indiana. Gary waits patiently for his turn to fly.



Don Langer (L), Duncanville, Texas, and Joe Utasi, Jomar Products, after successful flight with Cessna 310, Webra 91's and retracts. Only twin to fly at festival.



Partly finished Mosquito Bomber 1/5 scale — 40 lbs. with two geared Webra .61's. By Larry Scott, Kirkman, Iowa.



Excellent looking Waco, Taper Wing, by Larry Scott, Kirkman, Iowa.



Bob Campbell of RC Kits puts together his giant B-29 Superfort. 17 ft. wingspan, 145 lbs., (4) 2.4 cu. in. Kiorlitz engines. It crashed later in the week.



C. Cheeks, Buffalo, Texas, and his 50% Pober Pixy. 70cc Hornet for power swinging a 24" x 10" prop. Flew exceptionally well.



Bill Hunchis, Minneapolis, Minnesota, and Gee Bee Sportster Model Y — scratch-built, 17 lbs., O.S. .90, 16/6 prop.



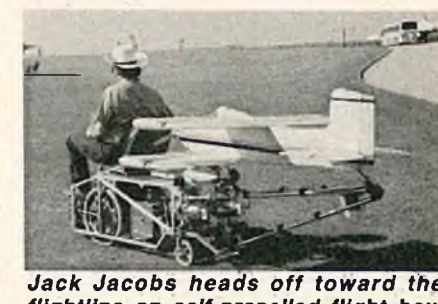
Rick Alter, Sioux City, Iowa, prepares to fly 12' Telemaster with Space Shuttle. Shuttle weighs 3 lbs. 12 oz., and is radio controlled. TM and Shuttle mid-aired with Tonny Bonnetti's Laser 200 — spectacular!



Dean Copeland ran a tight flightline although Saturday saw many mid-air's. The sky was full of airplanes!



Chuck Robinson and great looking P-40. Scratch-built, Kawasaki 3.15 cu. in., 2 years in building.



Jack Jacobs heads off toward the flightline on self-propelled flight box. Looks complicated. Airplane is 1/4 scale Hot Canary, 19½ lbs., Webra Bully. Jack says the airplane will knife-edge loop.



Excellent Fleet built from Concept plans. Kioritz 2.4 cu. in., K & B Super Poxypaint. J.W. Jones, Dallas, Texas.



Two times size Antic bipe on take-off. 12" bicycle wheels with Heath parasol landing gear. Phil Kling, Oxnard, California.



Cary Hurt, Lake Jackson, Texas, and F4U Corsair built from Zirolis plans. Quadra with Byro drive, 32 lbs. flying weight.



Ron Kobliska, St. Paul, Minnesota, checks the controls on his AT-6 Texan. Built from Nick Zirolis plans.



Jim Fenton, Kansas City, Missouri, and Curtiss Wright Jr. Quadra powered, 18 lbs., Super Coverite. Built from RCM plan #767.



(L to R): Don Godfrey, President of IMAA; Mel Nypulk; and Don McLean Sr., Sec./Treas. IMAA.



Woody Frantz, Tulsa, Oklahoma, built this great looking 1935 Kinner Sportswing, 2.3 Cobra power.



Nice looking UPF-7 Waco by Steve King, Greenwood, Indiana. Flies great with a Kawasaki 3.15 up front.



Piper Pacer, 1/3 scale, built by Dale Martin, Columbia Station, Ohio. Tartan twin ignition, flaps, 31 lbs., finished with Coverite and dope. Super flier.



Superb Byron P-51 — excellent workmanship. Built by Rick Quinlan and owned by Steve Wood of Decater, Illinois. Fuel tanks on wings are actually air tanks for the retracts.



Cockpit detail of Byron P-51 by Rick Quinlan — super detail.



Fairchild 22 and Rick Quinlan. 23 lbs., modified Orline kit.



Fairchild 24 — lots of excellent detail. Sorry, we lost the builder's name, however, the airplane is gorgeous.



One of the two large tents storing models overnight. Electricity was provided so that batteries could be charged. Both tents were full of models.

SCALE VIEWS

Col. Art Johnson

1983 National Scale Championships:

This year, scale competition turned into a real record breaker at the AMA National Championships held at Westover AFB, in New England. If you missed this one, you missed the largest scale competition event ever held in this country. Location of the Championships in the heavily populated North Eastern States had some impact on the numbers attending but there were plenty of scale modelers coming from California, Florida, and just about every place in-between. What a



A new O.S. Max 1.2 four cycle engine was flying Bob Karlson's reworked model of the F4F Wildcat. Fifth in Expert Sportscale.



John Nicolai attached wheels to his PBM-3 seaplane and made some spectacular take-offs using Estes rockets for a realistic Jato assist. Powered by two ST 71 engines, the PBM-3 was one of the largest models and the only multi-engined model to fly in Giant Scale.



Cliff Tacie holds wing of his FAI winning Spezlo home-built during static judging. FAI models were judged from two distances and positioned at different angles for the judges. Cliff is on the left.

change from last year where scale events drew only a minimal attendance at the Nebraska site!

With the exception of the nine FAI Scale models which were static judged on Thursday, all of the remaining models were static judged on Friday and flown through four rounds on Saturday and Sunday. This was an unprecedented task with 97 total scale models on hand. It was accomplished smoothly only through the extraordinary efforts of the Scale Director, Bob Underwood, AMA Officials, and the cooperation of the Pattern and racing fliers who managed to compress their schedules enough to give scale the full day on



Bert Baker brought his 1/6 scale P-47 from California to take third place in Giant Scale. The 19 pound model has a glass fuselage and is powered with a Rossi 90. Very stable flier.



Sportsman Sportscale models awaiting static judging. In the foreground is John Graham's Rossi 81 powered F-16 from the Byron kit. Fifth place winner in Sportsman, the model was finished in the new USAF F-16 Thunderbird colors.



Harry Hatcher's unusual model of the "Quicky" home-built lightplane flew well for a 7th place in the Sportsman Sportscale event.



both Saturday and Sunday. Fortunately the weather stayed good through the weekend and flying was uninterrupted from early morning through late afternoon.

Judging all of the scale models the day before flying avoided the waste of time that was a common complaint at former Nats Championships. With more than 100 models to judge (control line scale models were judged along with R/C scale), static judging became a major project. Again, the New England weather was on our side and all judging was done in a grassed area

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An OPS 65 hauls Kenneth Shufelt's MIG 15 up at a good angle. From the Byron kit, the model was one of five ducted fan models of jet aircraft flying in the Sportsman Sportscale event.



A real mix of aircraft types wait their turn to fly at Westover AFB. Cub, Gee Bee, WW I biplanes and WW II fighters in the ready box.



Me 109G from the Platt kit on final approach. Jeff Foley whipped spinner and cooling problems to keep flying his new model through the Expert Sportscale event.

of the AMA Headquarters motel with four sets of judges working back to back in the center of the area. Each of the R/C Scale categories of Sportscale Expert, Sportscale Sportsman, and Giant Scale were handled by a separate set of judges so that comparison of static scores between events would be invalid. This creates



B-29A on fly-by with #1 engine out. Frank Gonzalez model used Max 25 engines and had Fowler flaps, retracts and operating bomb bays.



Stubby Gee Bee with tail skid was tricky on the runway but most landings were successful. Another of Henry Haffke's models.



Bob Temple's Quadra powered "Judy" Japanese dive bomber featured torpedo drop. Model is from Bob Taylor's plans.



A very nicely detailed Morane Saulnier A-1 of WW I vintage. Tom Palapink's model scored in the upper third in Giant Scale.

no problem as contestants compete within their event just as they do in the different pattern and racing events.

As for the models entered in this year's Championships, the variety was simply staggering. This is the feature of scale that makes the event so appealing to spectators. Rather than the sameness of the models flown in other AMA events, scale has something for everyone. This time it was everything from 1915 style scout planes to the latest in military jets and civilian home-builts. Only the popular Cub was represented by more than two or three of a type and even the eight Cubs included a variety of clipped wing and non-standard paint versions. There were eight ducted fan models of modern jet fighters entered in three of the scale events.

Surprisingly, five of the jets were flying in the beginners Sportsman



Doc Marggraff brought his SBD-5 dive bomber up from North Carolina to enter the Expert class. Model is from the Jemco Master kit.



Cliff Tacie's Clipped Wing Cub is competitive with the best of models. Third place Expert for this one.



There were two very similar Fokker DR-1 Triplanes flying in the Giant Scale event. I am not sure if this one belongs to Dick Allen or to Walt Johnson.

Sportscale event. As I mentioned in a previous "Scale Views" column, all beginners to scale are not beginners to R/C flying. The exceptionally smooth runway of the Westover Air Force Base scale flying area was perfect for the jets (and all others except the tail skid planes) and all the ducted fan models appeared to perform well. If



Gee Bee Model D was Henry Haffke's FAI entry. One of three Gee Bees that Henry flew in the contest.



This nice flying Macchi C-202 put Richard Calderigi in third place Sportsman Sportscale.



There were 12 WW I vintage models at the National Championships. This Fokker D VIII was flown by Bob Hanft of Pensacola, Florida. Giant Scale event.



Many of the aerobatic aircraft used smoke to accentuate maneuvers. This is Dale Arvin's Great Lakes holding a bit of rudder in a knife edge pass.



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there was any disappointment in the variety of models, it had to be the low turn out for multi-engined planes. There were only three but these three were different enough to make up for lack of numbers. Tom Cook's twin-fan engined F4C is well-known to all scale modelers but this was the first time I had seen John Nicolai's Giant Scale PBM-3 powered by two ST 71 engines with on-board start. The model had wheels attached for runway take-off as the original was not an amphibian. Large Estes rockets attached to the sides of the model and fired on take-off made for a spectacular JATO type launch. Frank Gonzalez' B-29A,

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entered in the Expert Sportscale event, was new. It featured the most realistic working Fowler type flaps that I have seen to date. (Please do not ask me for details as I forgot to get Frank's address.) Unfortunately, the B-29 was damaged on the first flight when it stalled with an engine out.

The current breakdown of scale events into Expert Sportscale, Sportsman Sportscale, Giant Scale, and FAI Scale worked very well at the National Championships. Those of us who have seen an ever increasing number of competition quality, over fifteen pound, Giant Scale models entered in local contests this year were not surprised to find that AMA Giant Scale had more contestants than any other scale event. 35 models were entered with only one contestant bringing a model that exceeded the rule book limit of 40 pounds for AMA Giant Scale competition. Models were weighed as they were registered for static judging so that we know that even the large twin engine Giant Scale model came in under the limit.

Overall there were a few more models of military type aircraft than civilian, but in AMA Giant Scale the civilian light plane or home-built type were a big majority. There were only five WW II type models, but there were eight models of WW I vintage in the Giant class. The Fokkers and Sopwiths were quite a contrast to the faster fighter types and with four flight lines operating, there was often a real variety of aircraft types in the air. As far as preference for competition is concerned, I could not detect any trend among the Giants. Trophy winners among the first seven places included four lightplane or home-builts, two military fighters and one scout plane of WW I vintage. My P-43, Republic Lancer, lucked into the Giant Scale National Champion slot with Pete Reed's Starduster home-built in second place. Pete had a prototype of the Bantam 2.6 cu. in. ignition engine in the Starduster and it was certainly one of the most impressive power plants at the contest. The cowl was off the Starduster after every flight so that contestants could get a good look at the beauty putting out all those horses. Bert Baker brought his big P-47 all the way from California to place third in the Giant class. His new 1/6th scale model was done in Col. Gabreski's WW II colors and, with a glass fuselage, it weighed a couple of pounds less than his first prototype. The Rossi .90 was tempermental on the fuel available in the local area but Bert finally got it tamed down for a couple of good flights.

There were 23 models entered in the Expert Sportscale class and the split

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between military and civilian types was just the opposite of the Giant Scale event. There were more than twice as many military types as civilian with WW I through modern jet fighters represented. In spite of the predominance of military type models, three out of the first seven places went to models of civilian light planes. Again, no discernable preference.

Tom Cook has flown his F-4 ducted fan models at the Nats for four years having problems that he never has at other contests. It was no different this time on the first day, but on Sunday Tom managed to get it all together with flights making him the 1983

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National Champion for Expert Sportscale. The F-4F twin fan engined model is most impressive in the air and, next to Frank Gonzalez' B-29, it had to be the most complex model at the contest. Unlike the FAI rules, there is no reward for complexity in the present AMA scale rules but there is a real penalty if you cannot make a complex model work right. Maybe this is why we are seeing fewer multi-engined models in AMA scale events. It takes a dedicated modeler to do it the hard way.

Most of the models that placed high in Expert Sportscale have been around for some time. Hal Parenti's

F8F Bearcat was no exception. Familiarity with the model no doubt helped Hal take a handy second and the same holds for Ed Izzo's venerable FW-190-D9. Ed has been flying this one for a least five years and it does not command a good static score; however, Ed's flight scores were second to none which garnered him 4th place with the FW 190. Bob Karlson had reworked his F4F Wildcat Navy fighter and installed a new O.S. Max 1.2 four cycle engine. The refinished model looked good to me and it must have to the Expert Sportscale static judges as it drew the highest static score in that event. The new engine was a big improvement over the gear drive type that Bob had used in the model originally. The Wildcat flew and sounded more realistic than I remembered from previous contests and only minor flight problems kept the model from placing higher than fifth. Cliff Tacie has learned how to make models of light planes do a super job for him. His clipped wing Cub came up with the static and flight score for a third place in Expert Sportscale while his model of the Speizo home-built aircraft came in first in the FAI event. Cliff is living proof that a good modeler can hold his own in competition even with models of the most simple full size aircraft.

Participation in the Sportsman Sportscale event at the Nationals was a real surprise with 30 contestants bringing as big a variety of models as in Expert or Giant Scale. It was very obvious that newcomers to scale are not zeroing in on any one type of model. This class has everything from the Farman Moustique by Norm Rosenstock to the F-16 fan jet by John Graham. The Sportsman class actually had a bigger percentage of the more complex aircraft types than either the Expert or Giant events. Of eight Cubs in the contest, only one was entered in the Sportsman event. So much for the advice I gave in my last column on how to start in scale!

The top seven places in Sportsman Sportscale included two jet fighters, two WW II fighters, a civilian biplane, a "Quickie" home-built and a WW II rocket fighter. That is some kind of mix for our top newcomers to scale and it should make for some interesting contests as these modelers move into the Expert class. In fact, I suspect that all the top placers will be flying in Expert at their next contest. The points for advancement to Expert class add up in a hurry at a large contest and this was probably the largest Sportsman Sportscale contest ever. The first place winner racked up 29 points for advancement at just this one contest and he only needs 30 for a mandatory switch. C'est La Guerre!

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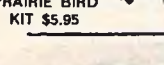

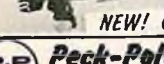
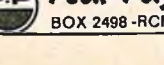
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Robert Fiorenzi did a nice job flying his A-4 Skyhawk from the Violet Jet Hangar Hobbies' kit, to first place in Sportsman. Right now I should mention that all scale models, regardless of class, were flown from one of four flight lines and received equal exposure to four sets of flight judges. Robert's flight scores for the F-4 were right up near the top for all model classes and well ahead of his closest competitor in the Sportsman class. James Stevens' ME-163 rocket powered German fighter came in second in Sportsman flying with a prop engine replacing the rocket of the
to page 178

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1983 NAMBA INTERNATIONALS

The 1983 version of the NAMBA Nationals was held in a foreign country the first time in the organization's history. The Olympic rowing pond located in Burnaby Park, Vancouver, British Columbia, Canada, was the site of this year's race. The facilities were great and the usually damp weather tendencies of this part of the country were nowhere to be found. Warm,

By Bev & Howard Power

sunny days matched our Canadian hosts' dispositions. The site had super facilities and the water was smooth for the most part. What more could you ask for?

It takes many people to run a good contest. Contest Director, Malcolm Fraser and Assistant Director, Chris Christianson, had their crews

working hard to make this Nationals a very pleasant experience for all of us. Our thanks to the Canadian working crew: Judy Fraser, who worked with the computer scoring and did the heat ribbons; Michelle Fraser, who ran the transmitter impound all week; Ian Nicol, Harry Jung, Glen Williams and Darby Wong, who made sure the computer worked without a hitch; Al Williams and Tom Christianson, who

Event	Contestant	Boat	Prop	Engine	Fuel
A Deep Vee	E. Fisher	Prather	X445	KB	60
	H. Power	Muck Spartan	X440	CMB	60
	W. Stewart	Stewart	3D8	KB	50
B Deep Vee	B. Schleimer	Prather	X447	OS	25
	C. Reynolds	Prather	X450	OS	40
	J. Prigley	Muck Spartan	RH-27	OS	25
C Deep Vee	B. Power	Muck Streaker	X450	Rossi	15
	R. Holland	Magic	X455	Rossi	50
	G. Swain	Wardcraft	X455	Rossi	50
B O.B. Mono	K. Galbraith	Pinckert	RH-25	KB	50
	R. Fish	Freedom	X447	KB	50
	J. Garcia	Pinckert	RH-25	KB	50
Scale Hydro Main Event Consolation Sport 40 I	A. Williamson	K & H	1462	Rossi 65	50
	B. Power	Scratch	X457	Rossi 65	60
	D. Tippin	Freedom	X450	K & B	25
	R. Neidigh	Dumas U-76	1455	K & B	40
	C. McGaughey	Cobra	X447	K & B	50
A Hydro	W. Stewart	Wing Ding	2.0	K & B	50
	B. Atcheley			K & B	50
	E. Fisher	Scratch		K & B	60
C Mono	E. Fisher	Prather	X455	OPS	60
	R. Fish	Condor 55	X455	Picco	50
	J. Andrego	Muck	X450	Picco	40
A Mono	B. Hornell	Wardcraft	X445	K & B	60
	B. Power	Muck	X440	CMB	60
	L. Dreith	Zinski	X445	K & B	60
A OPC Tunnel	R. Geraghty	Scratch	X442	K & B	60
	D. Caines	Geraghty Tunnel	X440/3	K & B	50
	F. Ward	MRP	X440	K & B	60
Sport 40 II	E. Fisher	Outlaw		K & B	60
	R. Fish				
	J. Hrubby				
Team Marathon	J. Prigley	Muck	RH-27	OS46	15
	B. Power	Spartan	RH-27	OS46	15
B Hydro	E. Fisher	Canard	1462	K & B	60
	J. Bruzzese	Pinckert	1462	OPS 44	50
	J. Oxley	Wing Ding	1462	K & B	60
B OPC Tunnel	J. Oxley	Prather	X450	K & B	60
	J. Monohan	Prather	X450	K & B	60
	T. Bellizzi				
X Mono	R. Holland	Prather	X457	OPS 90	50
	B. Power	Streaker	X450	Rossi 71	60
	J. Andrego	Muck	X450	Picco 80	40
B Mono	R. Holland	Freedom	1455	K & B	50
	E. Fisher	Prather	X450	K & B	60
	B. Power	Spartan	RH-27	Picco	60
C Hydro	B. Hornell	Canard	1465	OPS	60
	H. Power	Merlin	1465	Rossi	60
	E. Fisher	Canard	1467	OPS	60
A O.B. Hydro	R. Hazelwood	Crapshooter	1740	K & B	50
	R. Grim	Scratch	1740/3	K & B	50
	E. Fisher	Scratch		K & B	60
X Hydro	C. Reynolds	Scratch	1950/3	Twin OS 46	40
	J. Oxley	Wing Ding	1667	Picco 80	60
	H. Power	Merlin	1465	Rossi 71	60
A O.B. Mono	J. Hazelwood	Sting Ray	E-20	K & B	50
	R. Hazelwood	Sting Ray	E-20	K & B	50
	A. Williamson	Sting Ray	Muck 2	K & B	50

NEW RECORDS — OVAL RACING

C Deep Vee	E. Fisher	92.3 sec
X Deep Vee	B. Power	95.3 sec
B O.B. Mono	J. Garcia	218.1 sec
Team Marathon (100 laps)	J. Prigley	39:43 sec
	B. Power	



The Canadian Marine Modelers — our hosts.



View of the race site judge's stand from the spectator bleachers.



The pit area was paved and spacious.



NAMBA sweater girl "mom" coad in B.C. T-shirt.



X Hydro winners.



The pit area was paved and spacious.



A OB Mono winners. Notice the center hat.



B Deep Vee winners.

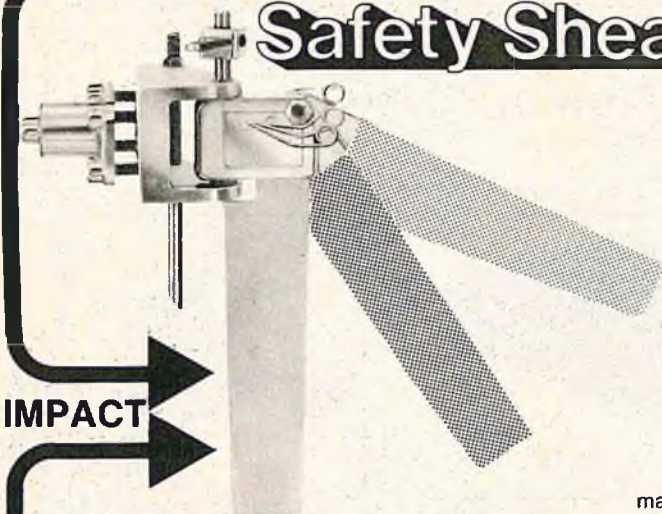


C Deep Vee winners.

did lots of work on the site and helped retrieve dead boats; Ginny Dallas, who did the entry check-in and

souvenir sales; Wendy Christianson, who made the banquet arrangements and souvenir design work; Dave Collis, Brian Dallas, and Dave Haydon, who seemed to be doing everything and anything that needed

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A Deep Vee winners.



B OB Mono winners.



Roger Newton's Miss Bud Scale Hydro.



Scale Hydro winner Al Williamson and his trophy.



Hall of Fame inductee Wally Stewart won A Hydro.



Bev Power's Scale Hydro Consolation Heat winner "Spirit of Dayton Walther."



A Mono winners.



B Mono winners.

to be done including the all important pit boss job; and Tim Harvey, who was

the race announcer (affectionately called "the mouth" of the host Canadian Marine Modelers).

The race facilities were super. The driver's stand was elevated above the water for an excellent view; the judge's stand was above the driver

level; and the computer scoring was the topmost level so that contestants



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C Hydro winners.



X Mono winners.



The "Kids are Boaters" gang.



Stock Tunnel winners line up for engine inspection.



Ron Erickson 70 mph straight-away record holding Scale Hydro.



Ricky Fish — "Kids are Boaters" winner with J.C. "Dead Boat Breakfast."

could not interfere with the scoring work. Alongside the judge's stand was a spectator bleacher area where several hundred people could view the racing. The racing pit area was on the other side of the judge's stand where

boats were launched from a floating dock. The pit area was a paved pier where the local Jaycees provided food and encouragement. There was even indoor plumbing at a race for a change!

Instead of a blow-by-blow description of the racing, we are presenting a table of information about what boats, props, engines, and percentage of nitro in the fuel were used by the first three places in most

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46" - 1016

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A O.P.C. Tunnel winners.

events. In addition to this information, the photos should provide you readers with a good overall view of this year's NAMBA Nationals.

There were several records set during the oval racing this year and the Team Marathon record was broken. Congratulations to you new record holders! The Club Team

to page 86



A OB Hydro winners.



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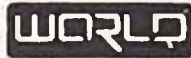
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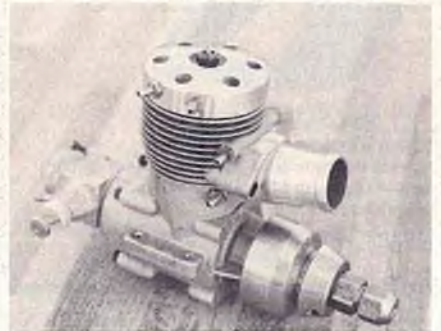
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Championship was won by a NAMBA District 9 team of Gold Coast Model Boaters (alias "The Eight of Us"). Team members were Judy and Bill Prigley, Bev and Howard Power, Gayle and Jim Andrego, Ron Neidigh, and Cecil Reynolds. This is the fourth time in eleven Nationals that the GCMB team has won this overall event championship.

After the racing was over, the annual banquet and trophy presentation was held. Two new members of the NAMBA Hall of Fame were inducted: Chuck McGaughey from the East Coast, and Wally Stewart, from Bakersfield, California. Congratulations to both of these fine gentlemen. Also, seen at the Nationals with his newest toy (a video camera) and his faithful side-kick, Trudy, was one of the "Prop Pops," Tom Prezenka. I guess meeting old friends and competitors, as well as making new friends, is what the Nationals is really all about.

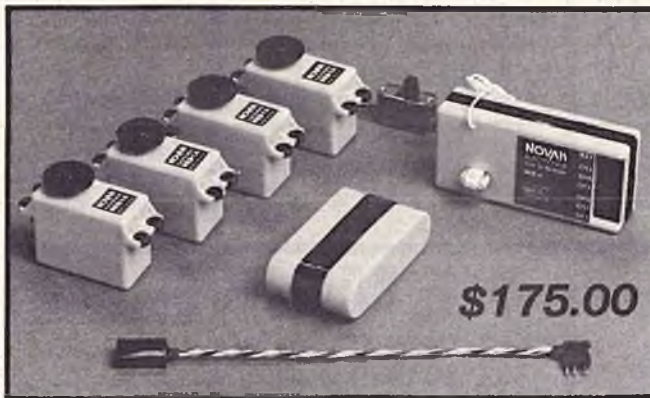
The next NAMBA Nationals will be held in the New York City area. I guess we are going to the "Eastern Shore in '84." Hope to see you all there next year.



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THE 4TH R/C SOARING WORLD CHAMPIONSHIPS

York, England, Aug. 1-6, 1983

By Al Doig

Individual Standings:

Ralf Dekker	West Germany	14410.7
Helmut Quaebek	West Germany	14265.4
David Worrall	Great Britain	14234.8
Rinehard Liese	West Germany	14178.1
Samuele Villani	Italy	14111.5
Michael O'Reilly	Australia	14022.4
Mark Smith	U.S.A.	13935.2

Team Standings:

West Germany	42854.3
Great Britain	41503.2
Australia	41272.7
9th U.S.A.	38633.1

Computer scoring was handled by Barry Webb and was through the courtesy of Spectra-Tek.

One of the nice things about being a renowned soaring correspondent is that the magazine will send me anywhere I can afford to go. This year it was the World R/C Soaring Championships in York, England. We will begin with a travelog.

As long as I was in England, I decided to have a look around; so the good wife and I rented a Ford Escort in London and set out, on the left side of the road, leaving a wake of terror. After leaving London, on Motorway 3, we stopped in at the remarkable stone pile, Stonehenge. Upon leaving Stonehenge, an obviously American tourist was heard to say: "Well, that's one more we can cross off the list." The lack of roller coasters or rides must

have been a terrible disappointment.

In Bath, we took one and snuggled down for a good night's sleep at a very nice quiet small hotel, The Villa Magdala. Bath is an interesting city and after having a look around the old Roman Baths, we pressed on into Wales. As an aside, if you are touring Britain on your own, the best way to find accommodations in a city is to go directly to the Tourist Information Centre, usually located in the City Centre. Here they will note your requirements, including price, and for 60 pence will ring up and make arrangements an an inn, hotel, bed-and-board, or whatever, which they feel is suitable. For 160 pence

they will make ongoing reservations at your next stop. We had extremely good luck with this system every time except one. In Kendal, when they



German winch cost \$900 — military tank battery.



Yonatan Peleg — Israel, flaperon controlled Dohel.



Sean Banister — Britain, 17th place — note canopy brake.



Mark Smith — U.S.A., 7th place ship named Panic.



First launch of contest — Mike O'Reilly, Australia, 6th.



Blanchard Stuart — Britain, 8th place.



Jose Avella — Spain, launching.



Alex Bower — U.S.A., 19th place. Larry Jolly, launching Roger Roth winchmaster.



U.S. winch — motor cost \$410 — specially built battery.

booked us into the original haunted house, I got as far as the lobby before fleeing back to the Tourist Centre for another try.

Driving the back roads and byways through Wales was a delightful experience, and a night spent in an "out of the way" country hotel, The

Pencerring, in Built Wells, was a pleasure. After noisy hotels in the U.S., the silence at this place was deafening. A most enjoyable evening can be spent in a Pub or hotel bar talking to locals, or exchanging experiences with other tourists. I don't normally drink beer, but due to a rigid

training programme before leaving the States, I was able to fight my way through a pint or two. The Pub, in England, is also an excellent spot for a good, inexpensive lunch. English Pubs and hotel bars have an entirely different character than most U.S. bars, being more of a neighborhood

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The winner, Ralf Dekker — Germany, and his sleek model.



Helmut Quabeck — Germany 2nd place — Dohel designer.



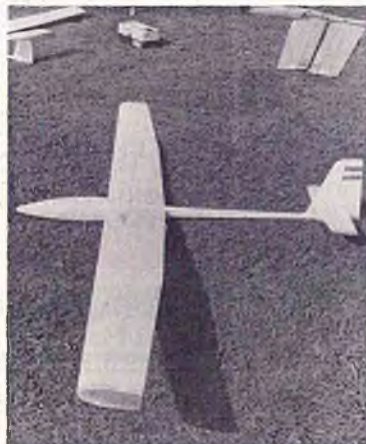
International cooperation — untangling Italy's winch line.



BBC Star Alex Bower, U.S.A., interviewed for TV.



Canadian duel winch — note large turnarounds.



Austrian Cirus molded wings with no hand finishing.



The infamous pork pie served for lunch, favorite of the U.S. fliers — as a field hockey puck.



Guilherme Salvador — Portugal, 44th flying the Balazio.



Kauo Kaneko — Japan.



Fifth place Samuele Villani — Italy.

social gathering place.

From Wales we drove through the beautiful Lake Country of Northern England and on into Scotland. My good wife, being a keen golfer, wanted to check out the Troon and Prestwick

courses.


We left Scotland behind, had a look at Hadrian's Wall and arrived in York on the Saturday before the Monday start of the contest. Accommodations were in the dormitories of the University of York and were quite good. Meals were served in one of the cafeterias. The flying site was absolutely world class — the infield (huge) of the Knavesmire Race

Course; grass as far as one could see, in every direction. It must be one of the premier soaring sites in the world.

The weather started out windy (15-20 mph) and cold all day long. Tuesday featured a wild thunderstorm right overhead, complete with one inch of hail. Wednesday and Thursday went back to wind and overcast. Friday was perfect with sun and little wind. The final day, Saturday, was a repeat of Friday.

Sailplanes from all countries were sleek and well-built. Most numerous were the Dohel, from Germany. Since this is a commercially available design, many fliers bought their aircraft. The Dohel is designed by Second Place winner, Helmut Quabeck. The wing has a 9% section with 1½% camber. The winner, Ralf Dekker, flew with a similar airfoil section but with 2½% camber. The wing is foam and fiberglass with a

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Tunc Uzum — Turkey, first time in Champs.



Japanese massage applied to Henry J. Nichols, front, and Guy Revel Moroz, Modell Magazine.



Wing signatures popular — Alain Lahoux — France, 15th.



Typical European radio — in housing. Joris Ten Holt, Netherlands, 11th place.



David Worrall — Britain 3rd place.



Freq. control by HP 8566A Spectrum Analyzer, Mark Sickling operator.



German Team — Lufthansa Flight #1, Ralf Dekker in command.

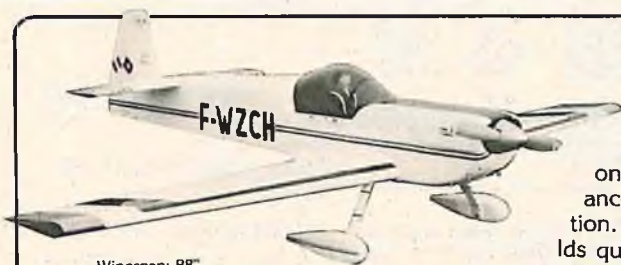
fiberglass reinforced spar. The ship is in rather limited supply as only 20 per month are produced.

Design technology has moved ahead from 1981 with the high technology ships turning 4 laps in the low 20's and the older designs in the high 20's and low 30's. The only non-aileron polyhedral ship at the contest was Alex Bower's (USA) Tai Tai. This was also one of the two thick wings (15% +) seen. The other belonged to

Marco Lorenzoni, of Italy, with a Mike Bame thick section. Aileron roll control predominated, although the Dohels had flaperons and one Swiss ship rotated the entire wing panel. A straight winged Sagitta was flown by Sweden. Swiss Ruedi Binkert employed a retractable spike on the bottom of the fuselage for stopping on landings.

The horsepower race was evident in winches. Those with powerful winches

launched high; those with average winches launched low. The West Germans used a commercially available winch costing \$900.00. The battery was a military tank battery. The U.S. winch used a motor specially built by DGM, Torrance, California, at a cost of \$410.00. It has specially wound large fields, a large armature and oversized brushes. It will turn 10,000 rpm. The battery was custom built by the Action Battery Co. All



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spare space on the bottom and sides were filled with lead plates. The battery case would normally house a 90 ampere battery. This one will supply 120 amperes. A #2 welding cable connects the battery to the motor. Almost all winches used monofilament nylon line.

On the other end of the power curve was hand towing by Sweden and Denmark. Towing, in general, has improved from 1981. It ranged from awesome to average. There were numerous wing failures on tow, including Don Edberg from the USA.

The events were: **Distance** — within an 8 minute working time, fly 12 laps (6 round trips) over a 150 meter course. Completed task earns 1000 points; less than 12, a proportionate score. **Speed** — within a 5 minute working time, fly 4 laps (2 round trips) of the 150 meter course. The fastest time in a round earns 1000 points. Slower times earn a proportionate score. **Duration** — within a 9 minute working time, fly for 6 minutes and land within a 15 meter circle. For each second of duration one point is given up to 360. For times over 6 minutes, one point per second is deducted. A 100 point landing bonus is given for landing within 1 meter of the circle center. 2 to



Peter Frank — Denmark, 12th place.

3 meters from the center = 95, etc; over 15 meters earns 0 points.

The "working time" previously referred to means that each contestant is allowed a "window," or working time to complete the task. One may land and relaunch as many times as he wishes during this working time but points stop at the end of this period regardless of whether he has completed the task or not. In Speed, however, once the course is entered, the task must be attempted and no further reflights are permitted.

The West Germans were so well-prepared and so consistent that from the first round there was little doubt as to the outcome, barring disaster. After the first round, the German team, at 8663 points, was 566 points ahead of the nearest challenger, the Netherlands, and was 3730 points ahead of the U.S. Ralf Dekker of West Germany, with 2991 points, was 135 points ahead of the nearest competitor, fellow team member Reinhard Liese, and 449 points ahead of the top U.S. flier, Alex Bower. While Dekker was later challenged by fellow team member Helmut Quaebeck and British flier David Worrall, he was ahead all through the contest and finished first.

In the first round, the American



That's all folks!

team came unglued and, while making a later partial recovery, set the pace for a lackluster overall performance. In the Distance task, Alex Bower maxed the 12 laps for 1000 points; Mark Smith could only manage 8 laps. Don Edberg never got out of the starting gate. After popping off tow three times and frantically changing towhooks each time, he appeared to get down elevator immediately on launch, crashed and destroyed his #1 airplane. This gave him a zero for the round!

In Round 1 Speed, Ralf Dekker of Germany set the pace with an 18.9 second run. Alex Bower had a so-so run of 24.8 sec. Mark Smith finished with 23.8 sec. In the 6 minute Duration, Alex Bower flew 5:58 min. but came up short for a zero landing. Mark Smith only got 5:33 but nailed a 100 landing.

Don't panic, I'm not going to give a blow by blow of the whole thing — just want to set the scene a bit. In Round 2 all three of our heroes made 12 laps in Distance for a max and 1000 points. Don Edberg was now flying his back-up ship — his last chance. With a throw-away round he could swallow the zero first round but there was no more room for error left. In Speed, the leader Ralf Dekker had a 22.4. Alex

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69⁵⁰

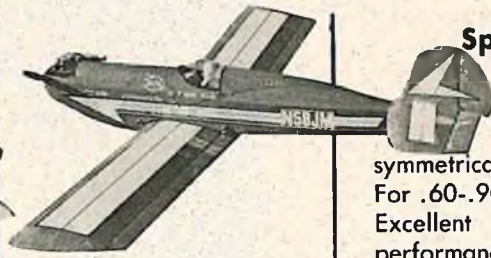
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Bower went for 25.3 and Mark Smith did a fine 23.6. Don Edberg launched for his Speed run. At the top of tow his wing broke and down she came. This gave him zeros for the two remaining tasks and put him out of the contest. Only two planes were allowed, so in order to continue, one or the other of the completely shattered planes would have to be rebuilt if he were to continue. From a personal standpoint he was out of it, but any additional points he could earn would help the team standing. Helper Brian Chan and the rest of the team worked long into the night repairing an almost hopeless cripple. Next day Don was

airborne and did well for the balance of the contest, considering he had to tip-toe up the launch to avoid undue strain on a repaired wing.

Except for a few burbles the U.S. team did reasonably well in the remaining rounds. Mark Smith finally got the hang of it and steadily improved to attain a final ranking of 7th. Alex Bower was 19th in the final standings.

Regarding the tasks, it was obvious to everyone that the Distance task needs some revision. Out of 355 Distance flights, 212, or 60% were maxes. 212 first places in this event is a bit much. Aside from some obviously

poorly flown flights, if you get good air, you make it; if not, you don't.

Speed separates the sheep from the goats. The high technology ships with superior pilots got low times. The ordinary ships with ordinary pilots got slow times. The poor pilots flying dogs needed a calendar watch for timing. The average fastest time for the 6 rounds was 20.6 sec., with two under 20; Dekker's (FRG) 1st round 18.9, and Worrall's (UK) 4th round 19.7 sec. The average slowest time was 51.6 sec.

In Duration, of course, conditions changed daily, and hourly. Since Duration was flown last in each round, it tended to be late in the day. Of 367



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SOLING-M is an extraordinarily realistic r/c model of that "ultimate" racing machine, the 27-foot Olympic Class Soling. At 50 inches and 18 pounds, Soling-M is big enough to perform like the real Soling, small enough to be launched easily. Well balanced and quick-handling, Soling-M is, we think, more fun to sail than any other model sailboat! The scale 800 square inch rig has a self-tacking four-panel jib and a five-panel main on a strongly braced 60-inch "bendy" aluminum mast. Both sails are sheeted to ball-bearing traveler cars and the Vortex SC-3M sail servomotor does the hauling. The SC-3M has the power you need to trim the sheets FAST and flatten the sails down HARD in 20-knot winds, because Soling-M glories in heavy weather, the kind that lays other model sailboats on their beam ends, and keeps r/c planes on the ground!

Soling-M uses three r/c servos for control: one for the balanced spade rudder, one to switch the SC-3M, and one to fine-trim the jib. Medium-size servos like the Kraft KPS-15 are best for rudder and SC-3M (smaller ones are OK), but a high-torque servo like the KPS-16 is needed for jib trim. [Jib trim is nice, but not a necessity, and you can use a 2-channel radio if you prefer.] Soling-M is watertight and can't capsize, so you don't need to put your r/c gear in a waterproof box.

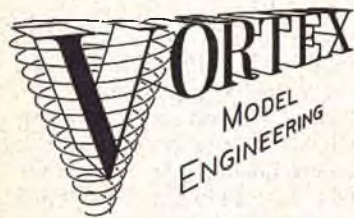
The Soling-M kit includes a beautiful white gel coated fiberglass deck/hull assembly with mast riser, rudder thwart, and stainless steel rudder shaft log installed; trimmed butyrate cockpit cover; aircraft birch plywood servo plate, with accurately cut fir stringers and beams; die-cast aluminum rudder and keel stub; 7-pound permanent-mold-cast lead keel weight; finished sails of Bainbridge® Dacron® sailcloth; extruded scale-section anodized aluminum mast and boom with all holes and slots machined; made-up shrouds and stays of nylon-jacketed 7x7-strand stainless steel cable with swaged-on stainless steel turnbuckle studs; dozens of tiny 2-56 stainless steel screws, nuts, locknuts, and washers; and a set of Vortex-designed stainless steel, Cycolac®, Delrin®, and Lexan® r/c sailboat fittings. This is a COMPLETE kit - right down to the stainless steel servo pushrods!



Building a Soling-M will take you twenty to forty hours, depending on how much painting you want to do. [The deck has molded-in scale detailing and doesn't need any paint. Most builders leave the hull white also, but you might like to trim the deck/hull joint, and the hull is scribed for an optional waterline stripe. You can paint the metal keel and rudder or leave them bare.] You'll start by sanding down the deck edge flush with the hull sides. Then you'll join the two keel castings, mount the deck hardware (we've drilled all the holes for you), jigsaw and drill the servo plate parts and assemble them, install the r/c gear, and put the sail rig together.

Price of the Soling-M kit is \$495, and the new SC-3M sail servomotor (a low-cost version of our standard SC-3) is \$125. Order them by calling us any weekday, eight to noon or one to five Pacific Time. We'll answer your technical questions, tell you the shipping charges, and take your credit-card order or send you literature. The illustrated Soling-M Assembly Manual, with complete parts lists, step-by-step building instructions, and notes on rigging, adjusting, and sailing, is also available separately. Send \$19.00 (deductible from your Soling-M kit order) plus \$2.00 for packing & shipping, and we'll airmail it to you.

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Duration flights, 189, or nearly half, were more than 5:45 out of the 6 min. There were seventy-six 100 point landings (inside 1 meter diameter circle).

Organization of the entire meet, including housing, social activities, meals, banquet, etc., was superb. Jeff Dallimer and staff worked extremely hard. Richard Douglass was everywhere at once. George Stringwell, Contest Director, and Mike Proctor, Contest Manager, ran things so well on the field there was not a single official protest filed; quite an accomplishment when you consider there were 25 countries represented with the attendant language difficulties. Ann Proctor put together a flawless series of tours and social activities for wives and supporters. There were a total of 75 people working all week on the field — more than one for each contestant. All stations were connected by walkie talkies — just a fantastically successful undertaking.

Frequency control was excellent. A Hewlett Packard #8566A Spectrum Analyzer monitored the frequency in use. As each contestant received his transmitter, that frequency was examined against the frequency listed. Any low amplitude signals were noted and relayed to the flight lines. Multiple signals on one frequency could be immediately detected.

The U.S. team traveled to York very well-equipped. They had the best (and most) winches. The ground crew was truly a machine. They knew their jobs and performed flawlessly (to my observation). Rich Schrameck, San Diego, California, was Team Manager; Roger Roth, Rancho Palos Verdes, California, was Winchmaster; Colin DiMaio, Los Angeles, California, ran the lines; Larry Jolly, Santa Ana, California, launched all sailplanes; Brian Chan, Hillsborough, California, was in charge of model repair; line maintenance was the responsibility of Keith Finkenbinder, Fremont, California; and Steve Neu, San Diego, California, was the electronics expert. Any one of these men could have flown in the World Championship. The fliers were: Alex Bower, age 18 who hails from Los Angeles, California; Don Edberg, age 26, lives in Palo Alto, California; and Mark Smith, age 32, lives in Escondido, California. Alex just graduated from high school and will attend Davis University as an Aeronautical Engineering student. Don is a Ph.D. candidate at the Department of Aeronautics, Stanford University. Mark is proprietor of "Marks Models."

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PIT STOP

Gene Husting



The 1983 World's Championships were held in Carnoux, France. Opening ceremonies commenced with a French military band and Michelin Lesieur standing next to the first place trophy. Michelin was the Race Director and ran a super fair race.

1983 World's Championships Carnoux, France

There is no way to describe the track, or racing facilities, at the Carnoux track, even with 100 pictures. We had seen 100 pictures of the track before arriving in Carnoux. Still, actually being there and seeing this incredible track, was simply awe inspiring. It would be hard to imagine that someone would even dare to dream of building an R/C car track like this, but for Mr. Rene Rossi to actually build this dream track, was still unbelievable, even while you're actually standing there looking at it!

The track itself is 1,000 feet long; much longer than any track in the USA. The straightaway is 300 feet long, which is about 100 feet longer than any track in the USA. But even that isn't the major difference between the Carnoux track and our USA tracks. Most of the tracks in the USA are on parking lots, which are flat. All of the corners, except for 2, on the Carnoux track are banked! That means each corner is entirely different from any other corner we've ever raced on. To say that the Europeans would have an advantage on this track would be an understatement. To say the Italian or French teams would have a



Part of the opening ceremonies was the introduction of all the racers by country. This is the USA team.

further advantage, was taken for granted. We were told the Italian team had practiced on this track every other week for the last 8 months. They were certainly going all out to win this one, and from the stories we heard, no one else stood a chance. We'll see.

After an all day flying schedule, which included missing our Marseille flight by 5 minutes, which caused us to have a 5 hour layover in the Paris airport, we finally arrived in Marseille. The 45 minute drive to the hotel, actually took 2 hours because someone got lost. It's not the easiest thing to caravan through a different country. But we all made it okay. Carnoux is in the South of France about 10 minutes east of Marseille and about 15 minutes from the Mediterranean Sea; fairly close to Cannes, Nice, Monaco and St. Tropez.

The next day was Saturday and our first look at the track. There were only about 40 drivers there so far, so it was a perfect day for practicing, except for one thing. We didn't have any fuel! The whole Associated team of 20 drivers didn't have their fuel. The fuel was actually in Marseille in Customs, where it had been sitting for one month. Micheline Lesieur, the Race Director had been trying to get it out of Customs, but they would not release it. She promised it would be here



More opening ceremonies, but also a view of the track to the left of the driver's stand. All the corners were banked varying amounts.

tomorrow. She was doing her very best to get it. She even had the Mayor of Carnoux, Mr. Jean Chaland, trying to get Customs to release it, to no avail. We finally managed to borrow two gallons of fuel from Dave Preston. Two gallons for 20 drivers didn't go too far, but at least they got some practice. It was a shame, because we needed all the practice time we could get.

The next day Customs had released 4 cases of the 24 case shipment. But one case was marked John Thorp and a second was marked Dana Smeltzer. We shipped their fuel along with the rest of the team's fuel. This left 2 cases for the team. The following day I spent the whole day at Customs, when they finally released the fuel. The fuel was supposed to be released duty free, but I think they must have lost that page in their manual, because they charged me for the duty and then kept one case for themselves! They're something else. By the time I got back to the track it was almost dark and our group had been complaining about motor overheating problems. We thought it might be because the straightaway was so long that the engines were on



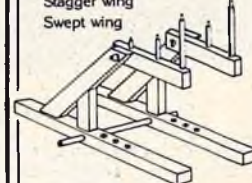
The right side of the track with more banked turns. One of the most interesting tracks we have ever raced on.



The 300 foot long straightaway also contained the pit area which made for some exciting pit stops. Only half the straightaway is shown.

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The American team was pitted away from the track. We couldn't see all the racing, but it was quieter.



Individual pit areas were a little cramped, but we survived.



The cars also had an international flavor with the flags of the country of each racer on the wing. This is Curtis Husting's car.

full throttle so long, they were getting too hot. But it was only about 85°, and that shouldn't be any problem. We were also running new prototype 2 speed transmissions and new mufflers and both of these were thought to be the problem.

The next day was the last day of practice and we were still in trouble. Our motors would only run fast for 5 minutes and then they would get so hot, they'd slow way down. Thorp was having no problems. Arturo and the rest of the Delta team were having no problems. The problem was actually our fuel, but we didn't know it or even suspect it, because we had been running the fuel for the past 8 months during the winter, with no problems. We used it at Series races, at the Winternationals, the El Paso race, the McCoy race with no problems but at all these races it was 50° to 70°. We never solved the fuel problem in France. It wasn't until halfway through the following week in Germany, at the Wiesbaden race, that we added 4 ounces of castor oil to our fuel and all our motor problems disappeared. A week too late.

Wednesday afternoon at 5 p.m. they had the official opening day ceremonies and it was simply spectacular to say the least. The track was cleared and a 50 man French military band played a number of songs. While they played, a full size helicopter flew in the beautiful first place trophy to the track. 1,000 balloons and a few hundred pigeons were released. A group of baton twirlers performed. Then the racers marched onto the track, country by country, with each driver's name announced. The full USA team marched in with impressive looking blue jackets from Style Auto. It was about 85° but everyone had their jackets on. It looked great! I think the Carnoux Mini-Racing club deserves a great deal of thanks for all the time and effort they put into making this a fantastic race, and event. It was awesome!

Thursday was the first day of qualifying. The drivers were split into 2 groups — A & B. Each driver got 3 rounds of qualifying on Thursday and 3 more on Friday. This track was definitely not an easy track to drive. It

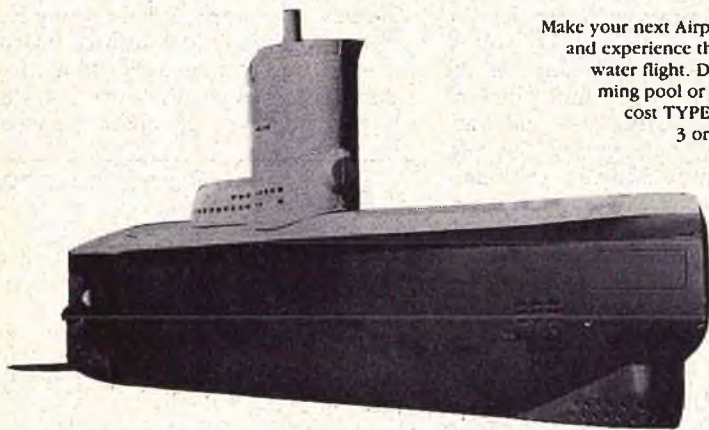
was designed to separate the greats from the not so greats. Or, the racers who had a lot of time on the track from the ones still learning the track. The first time I saw the Italian team on the track, I thought — we're in a whole lot of trouble. It looked like they knew the track so well, they could have driven it blindfolded. They were certainly ready.

But something happened they hadn't planned on. Ralph Burch Jr, from Denton, Texas, was celebrating his 16th birthday today. His idea of celebrating is to drive fast. And this he did. Ralph gave everyone something to shoot for, as he turned 29 laps in 10 minutes and 10 seconds. But it wasn't so much the fact that he did it, but how he had to do it. When the qualifying heats are 10 minutes long, but your motor only runs fast for 5 minutes before it heats up, what do you do? Simply richen up the engine — correct? Well, it wasn't quite that easy either, because the 2 speed transmission shifted at 25,000 rpm, so the engine couldn't be richened up as much as we would have liked, or it wouldn't get up to shifting speed. The trick was to run it rich enough to last 10 minutes and still shift. Well, when Ralph Sr. had the carb set this way, the engine sounded like it was almost in a 4-cycle. Most of the other cars, except for the Serpent cars from Holland, were running single speeds, and their motors were turning over 30,000 rpm halfway down the straightaway. Ralph's car sounded so slow, most of the other drivers couldn't figure out how he was getting around the track so fast. Re-Pete Fusco got a good run in and was sitting in 2nd spot behind Ralph in the "A" group. The "B" group ran in the afternoon but no one could better Ralph's time.

The next day Ralph turned another 29 laps in 10 minutes 13 seconds giving him the two best times overall. Gary Culver from England managed 29 laps for 2nd spot. Giulio Ghersi from Italy took 3rd spot with Rody Roem from Holland in the 4th spot. These four drivers would go straight to the Main Event. It's interesting to note these four drivers were from four different countries using four

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different kinds of cars. Burch raced the Associated RC500 car, Culver the PB Alpha car, Gheresi the SG Columbia and Roem the Serpent Quatro. The drivers and the cars are getting closer around the world.

The USA, as a team, wasn't doing too bad, as 5 of the top 13 were USA drivers. Burch was 1st, Arturo Carbonell seemed to be having a lot of small problems, but his last run was a super one placing him 5th. Curtis Husting was just a couple seconds behind Art in 7th. Re-Pete Fusco was in 9th, with Rich Lee 13th. Bill Jianas was next in 28th, Gil Losi Jr — 36th, Dana Smeltzer — 39th, Gene Husting — 41st, Rick Davis — 43rd, Chuck Moon — 67th, Roger Curtis — 68th, and Kim Davis — 78th. Without making it sound like an excuse, but more as a matter of fact, Jianas, Losi, Smeltzer and Rick Davis would certainly have qualified a whole lot better with the proper fuel. Their cars were working super and they were all driving super, but 5 minutes fast is not long enough in a 10 minute race. The engines after 10 minutes were crackling, plugs gone and the power pods were too hot to touch.

This is not to imply that we were the only ones having problems. In looking down the list, there were some awful fast drivers from other teams who also are normally much higher on the lists. Like Steve White — 18th, Bob Errington — 24th, David Lecat — 26th, Ronnie Ton — 30th, Peter Bervoets — 37th, Naoki Ishihara — 44th, Katsunori Kondo — 50th. We all know what they can do.

Something else interesting happened on the last round of qualifying. The organizers decided to tech inspect the engine out of the fastest car from each team without telling them ahead of time, which I thought was a super idea. It keeps everyone honest, and everyone knows no one else is cheating. Well, on Ralph's last run his dad decided to let him go for broke. He set the motor the way we normally run them, and young Ralph took off like a bullet. The motor was buzzing, the car was flying and Ralph said it was actually easier to drive. Everyone around the track

1983 WORLD'S CHAMPIONSHIP RACE CARNOUX, FRANCE

	Name	Country	Laps	Car	Motor
1	David Lecat	France	165	PB	Picco
2	Ernes Tadiello	Italy	164	SG	OPS
3	Rody Roem	Holland	164	Serpent	OPS
4	Dana Smeltzer	USA	156	Associated	K & B-McCoy
5	Gary Culver	England	150	PB	Picco
6	Phil Greeno	England	147	SG	OPS
7	Peter Bervoets	Holland	137	Serpent	Picco
8	Vittoriano Orazi	Italy	111	SG	OPS
9	Giulio Gheresi	Italy	92	SG	OPS
10	TQ Ralph Burch Jr.	USA	55	Associated	K & B-Lee

stopped what they were doing and knew they were watching a 30 lap run. Sure enough at 5 minutes Ralph had his pit stop in and was on an easy 30 lap pass. Then at 6 minutes the engine didn't sound as clean, at 7 minutes it slowed way down and at 8 minutes the rod blew. That was the motor they wanted to check because it was so fast. But the Rich Lee built K & B engine was perfectly legal, as we all knew, but now everyone knew. Even though a K & B engine was used in the Top Qualifier car, we all know that besides the engine, the car and driver have some bearing on the performance, too. It would be difficult for me to say the K & B engine was any faster than the Picco or OPS motors but easy to say it was certainly no slower than any of the other engines. They were all very close.

Saturday were all the Mains. There were four sit-outs for the "A" Main or Finale Race. Then there were two "B" Mains, two "C" Mains, etc. The first three finishers in each of the lower mains could move up to the next main. This seems to be a very good method for a World's Championship event. As an example, Dana Smeltzer was in the "D" Main, finished 2nd, won the "C" Main and moved into the "B" Main. During qualifying, Dana was using the same fuel as the rest of us because he said it had more power. But for his mains he used his own fuel which he said gave better mileage, but it also eliminated his overheating problem.

In the first "B" Main, Ernes Tadiello won and David Lecat finished

2nd, moving both those drivers into the "A" Main. Lecat earlier won the "C" Main.

In the 2nd "B" Main were five USA drivers, but with a mathematical chance of only four making the move up to the "A" Main. We knew we were going to have trouble running 30 minutes, except for Dana. At the start, Arturo Carbonell took off in the lead, with Curtis Husting right on his bumper, down the long straight where the cars reach 70 mph. Art was driving super and Curtis was content to run 2nd. Both cars were pulling away from the field. At the 2 minute mark, Art clipped a dot and Curtis took over the lead. Art dropped to 2nd with Re-Pete Fusco in 3rd. Curtis held the lead for 10 minutes, but Rick Davis, who was pitting for Curtis had to richen up Curtis' motor to keep it running, and the other cars started closing up. I was pitting for Re-Pete and I was having the same problems. You had to keep the motor running fast enough so you didn't get run over on the straightaway, yet rich enough to keep running, but there simply wasn't a carburetor adjustment we could make with this fuel to do both. About the 15 minute mark, Dana caught up to Curtis and took over the lead. Curtis tried to keep Dana in sight, but Dana slowly pulled away. Art was running good at the beginning, but one of his rear tires chunked and one of his front tires was coming off, so he started dropping back. Rich Lee had borrowed some of Thorp's fuel, but Rich tried to

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Because of the long straightaway, Associated developed an automatic 2 speed transmission for the team. The transmission shifts for 6 to 1 to 5 to 1 at about 25,000 rpm.



A very busy part of the pit area was this lathe/mill which was used to make parts and also true tires as Rich Lee, Rich Potempa and Rick Davis are doing.



Ralph Burch Jr., was the class of the field as he posted the two fastest qualifying times and took Top Qualifying honors with his Associated RC500 car powered by a K & B-Lee engine.

RCM PRODUCT REVIEW

Proctor Enterprises NIEUPOORT 28-C1



After having built all of the Proctor line, we eagerly awaited the pleasure of constructing Lou's latest masterpiece — the Nieuport 28. The standard kit was purchased from Proctor Enterprises, and is available in three versions. The huge cowl and some fuselage bulkheads with other large miscellaneous parts are in one big square box while the remainder comes in a rather long box. As usual it is a very complete kit with all hardware included. Please do not open the plastic bags which contain turnbuckles, little bolts, tiny nuts, fittings, etc., until the parts are needed; as the construction proceeds you will use them all.

We were amazed at the wood in the kit, not much balsa, mostly spruce and plywood, all of which is hand cut or stock --- beautiful! The fuselage spruce cross pieces are milled "tee" sections while the wing spars are milled "I" sections; real scale construction here. There are so many custom parts it would take a complete article to list them --- suffice to say it is one of the most complete scale kits we have had the pleasure of reviewing.

Construction:

The first order of battle is to unroll the plans, four sheets, get out the instruction booklet, all 42 pages and study. While not difficult to build, the airplane does take some modeling skills and is not recommended as a first airplane. Whatever you do, follow the manual checking off the items as they are completed. The construction pictures are a big help on certain steps and should be cross-referenced.

Construction was started on the fuselage and is very straightforward being a basic box with formers, stringers and cross bracing added. All cross bracing is bamboo and was painted black prior to installation. There are a total of 106, 1/32" cross braces in the kit! Just an idea as to the detail and planning that went into the kit. A pin vise with a drill bit was used to drill the holes for the bracing; it goes quite fast this way. Initial cementing was done with Hot Stuff, as was most of the construction throughout. All of the joints were then recoated with Duco cement as it seemed to tighten the bamboo up. Some parts also require staining and this must be done prior to installation. Be sure to use a

SPECIFICATIONS

Name	NIEUPOORT 28-C1
Aircraft Type	Scale
Manufactured By	Proctor Enterprises P.O. Box 1333 La Jolla, California 92038
Mfg. Suggested Retail Price	\$329.00 (Std. kit)
Available From	Both Mfg. & Retail
Wingspan	80½/70 Inches
Wing Chord	12/10 Inches
Total Wing Area	1726 Square Inches
Fuselage Length	53 Inches
Stabilizer Span	27½ Inches
Total Stab Area	220 Sq. in.
Mfg. Rec. Engine Range	60 Gear Drive & Larger
Recommended Fuel Tank Size	16 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt. Ail.
Basic Materials Used In Construction:	
Fuselage:	Plywood, Spruce
Wing:	Plywood, Spruce
Tail Surfaces	Spruce, Balsa
Building Instructions on Plan Sheets	Yes
Instruction Manual	Yes (42 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Royal Classic
Engine Make & Displacement	Magnum II 2.5 cu. in.
Tank Size Used	16 Oz.
Weight, Ready to Fly	16 Lbs.
Wing Loading	6.74 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Everything.

WE DIDN'T LIKE THE:

Nothing.

lacquer base stain. (A complete listing of paints will be found in the covering section of this review.) The cabane struts are added to this box assembly next. They are streamline aluminum tubing with hardwood inserts pre-drilled at the required locations. Various bulkheads are added and the fuselage begins to take shape. As there are four removable hatches on the forward part of the fuselage sheeted with 1/32" plywood, take your time to insure that they all fit close, no big gaps. In fact, fellow modelers who looked at the basic fuselage had a rough time telling where the removable panels were. At this point construction goes rather quickly and you can see some progress.

The landing gear construction is simplified as all struts are pre-bent with holes drilled. The gear axle is 1/4" round steel and fully shock mounted with bungee cord. The tail skid is also shock mounted with a brass skid plate no less!

The cowl cut-outs come next. Rough cut with a spiral saw and final trim with a Dremel tool. The oil tank filler was added to the top of the cowl with tubing and flat stock. Hot Stuff holds everything in place and it adds something to the cowl. No cut-outs were made for engine access at this time. Adding the cowl to the fuselage just about winds up the fuselage construction.

The tail feathers were done next. All of the horizontal stab and rudder edges are made up of pre-shaped 3/16" reed — light but strong. We used the hinges supplied, adding



them during the pin-down construction to insure a true surface. One piece of music wire was used instead of separate pins for each hinge which allows you to remove the surfaces by sliding the wire out. All of the tail was then painted black for a scale appearance. Bolt the horizontal stab to the fuselage and route the elevator cables to the radio area. Add the vertical fin and rudder and fish these cables through also. Strings were tied to the forward end of the cables so that the tail could be removed for covering and painting. On final assembly re-tie the ends of the string to the cables and pull the cables back through the fuselage. The stab and fin are removable at any time as they are mounted via scale type fittings.

The only thing left now are the wings. They are best approached by staining all of the applicable parts, and painting the wing braces black. The wing spars have numerous filler blocks, all added prior to staining. All of the ribs are pre-cut 1/32" plywood with the outer tip ribs requiring some modifications. Do all of this prior to adding the capstrips. Since the wing plans show left and right sides, all the wing panels may be built at the same time if you have a large enough work table.

At first glance the wing ribs look like a very time consuming chore (what with adding all of the capstrips) but we came up with a quick, easy way to polish them off. After staining the ribs, get a pan of water and soak the capstrips. Holding a rib in your hand, add the lower cap starting at the T.E.; leave enough excess for the wing T.E. fit, see the plans for this. Using Hot Stuff, start at the rear and bend and glue the cap towards the L.E. Trim at the front end, as per the plans, and add the upper cap in the same manner. Make sure the caps are damp during the procedure. Sounds harder than it really is. Lou has a neat method, but we found this way quicker and stronger. Take your pick!

For the actual wing construction make sure you have a true building surface. Nothing is complicated but it does take time. Work slow, follow the instructions, and you can't go wrong.

At this time, everything was fitted together by adding the pre-shaped spruce interplane struts. Now is the time to completely rig the aircraft before covering begins. The wires are easy to remove for covering, finishing and also for transporting to and from the field.

Engine:

We were concerned about the need for additional nose weight, so we elected to use the Magnum II gas engine. The installation was fast and painless as it came with a mount, muffler and prop hub. Mounting the engine inverted allows the exhaust to come out the scale opening on the bottom of the fuselage; no modifications were needed. An ignition kill switch was added to the installation for safety. A 16 oz. Sullivan tank was placed right aft of the firewall in a balsa cradle.

Radio:

Radio installation was next. Royal Electronics new D-8 and Demon servos with a 1000 mah battery pack were utilized. We did not use the bellcranks supplied with the kit for rudder and elevator but hooked the cables directly to the

servos. Use Du-Bro rigging couplers and clevis with lock nuts. Shift the radio components around so that you have a nose heavy condition; covering and finishing will bring the C.G. back as the nose moment is short.

Covering:

Now take everything apart and start covering. Label all of the wires fittings, etc., so that you can put them back in the correct positions later. White silkspun Coverite was used after painting all surfaces that the covering will adhere to with Quik Stik. The undercamber wing posed no problem at all. Scale reinforcing tape on each rib and the fuselage stringers was added after the first coat of dope. This was cut from the Coverite and ironed on. A total of four coats of clear nitrate were brushed on, sanding after each coat. Rib stitching blots were then put on with white glue. One light coat of acrylic lacquer primer was sprayed on the complete airplane and sanded with 400 wet.

A set of color pictures of a Nieuport 28 replica was obtained from Scale Model Research, P.O. Box 685, Orange, California 92666. Colors were matched to the photos and be sure to add plasticizer to the paint. No fuel proofing is required if using a gas engine. All markings should be handpainted using tape and stencils.

Paint and stain listing: Acme Pro-kriil Acrylic lacquer: Bright red, (6-11124X); polar white, (6-11707); brilliant blue, (6-25066X); olive drab, (6-91789); redwood, (84-32403); brown, (6-11382); amber tan, (84-31897); antique cream, (6-25366). Behr lacquer base stain: Cherry mahogany, (509); light oak, (510).

Flying:

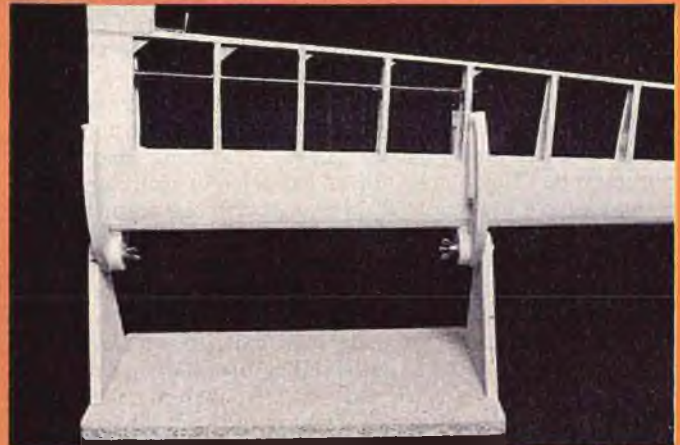
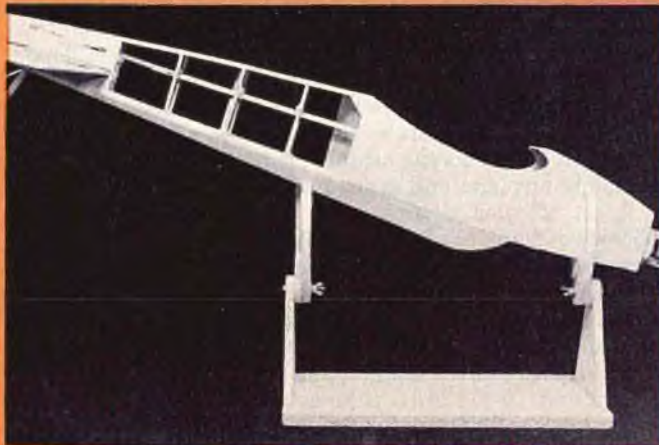
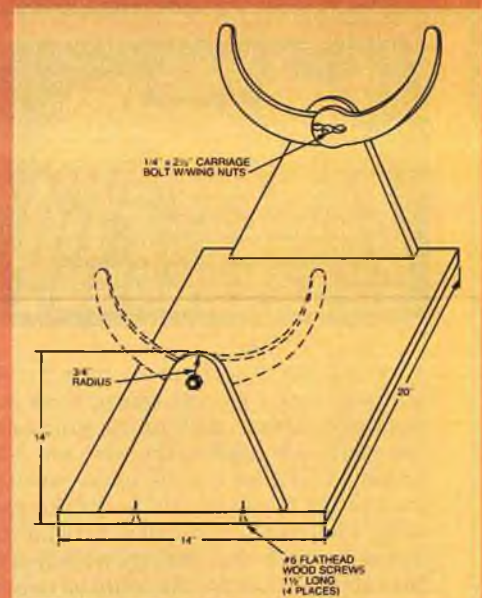
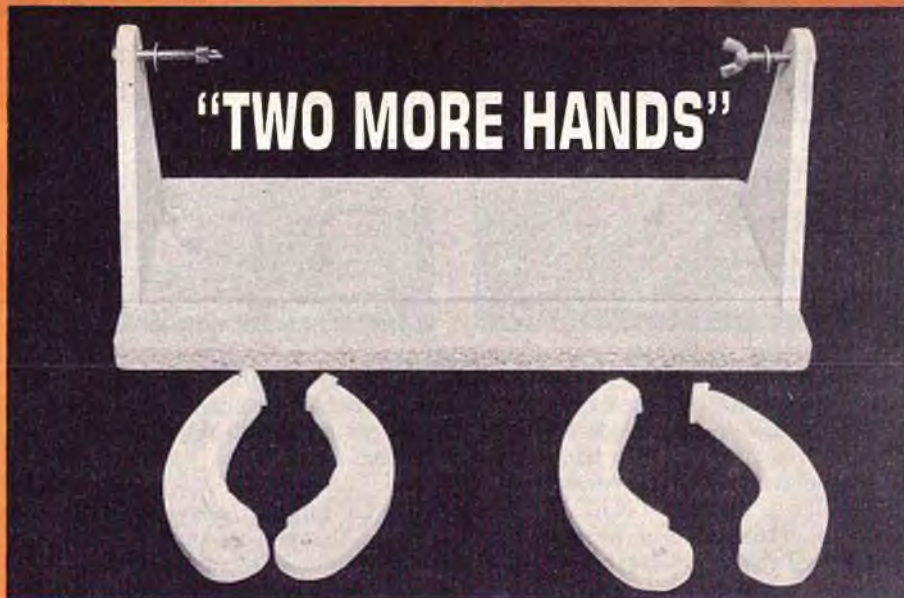
One trip to the flying site to check out the engine and radio prior to flying was made. On the first try the engine roared to life and was put through its paces. Max rpm with a Top Flite 20/8 was 6300 and idle 1600. No needle valve adjustments were needed.

The engine performance was very impressive with low vibration levels at all throttle settings. From the power produced, it was sure to fly at half throttle. The time had come for the Nieuport to sprout its wings. After rechecking the engine, the machine was lined up on the runway and the throttle advanced. At about a slow walk the tail came up and in another 10 feet it was flying. The flight was anti-climatic after several months of work. It required no trim at all and flew hands off at half throttle, sounding and looking very realistic. The sound of the Magnum II in the air is very realistic, not the high pitched whine of a glow engine which would spoil the whole effect. The sound of the rigging wires singing during a low pass are a real turn on. The landing was a piece of cake, touched down like a feather, engine still ticking over. What a machine!

Conclusion:

We honestly can't say enough good things about this project. It is quite a bit of work but well-worth it.

As an added bit of information, Lou Proctor has sold his interest in Proctor Enterprises to Charles Favor, a newcomer to the modeling world. Mr. Favor assured us that the same Proctor quality will continue to come out of the company. □



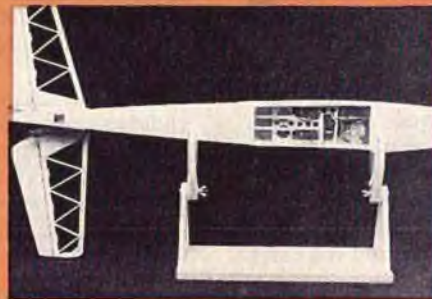
A Holding Jig By Luigi Micheli

Text by Eric Strengell

So often during construction we modelers are plagued by little inconveniences that often erupt into major problems. One such problem that has probably annoyed balsa whittlers for decades is the inability to hold a wing or fuselage steady and in a position where we can comfortably work on them. Stacks of books, crates, bottles, and other handy objects, have often been pressed into service, but with unsatisfactory or even disastrous results.

Luigi Micheli, Viareggio, Italy, had similar difficulties until he devised the simple, inexpensive, "two more hands" holding jig as shown here. It can be built in about an hour using scraps of 1/2" to 3/4" plywood or particle board and standard sized hardware.

Begin construction by cutting out the parts using the full size pattern to make four identical arms and the drawing dimensions for the base and



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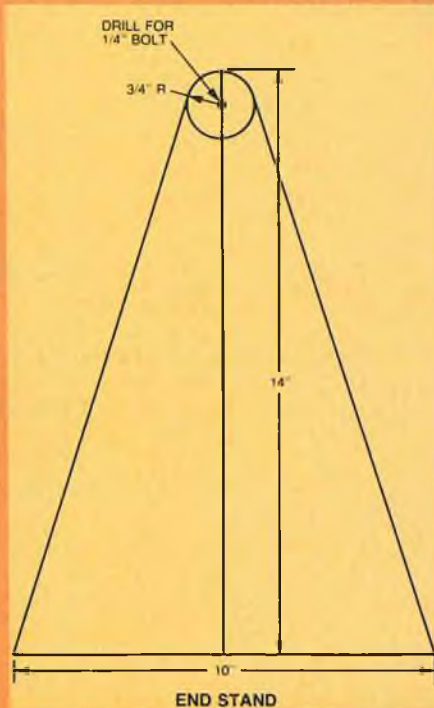
triangular end stands. Drill 1/4" mounting holes in the arms and end stands.

Once the wooden parts are cut and drilled, the jig can be assembled. Drill four 1/8" holes through the base into the end stands which are then secured with Titebond or similar glue and four 1 1/2" long #6 flat head wood screws.

The holding arms can be attached as shown using two 2 1/2" long 1/4" carriage bolts, secured with flat washers and wing nuts.

To protect tender balsa parts from dents and dings, cover those areas of the holding arms that contact the work with poly foam weather stripping tape. This tape is inexpensive, self-adhesive, and comes in a variety of widths and lengths. It is

to page 116



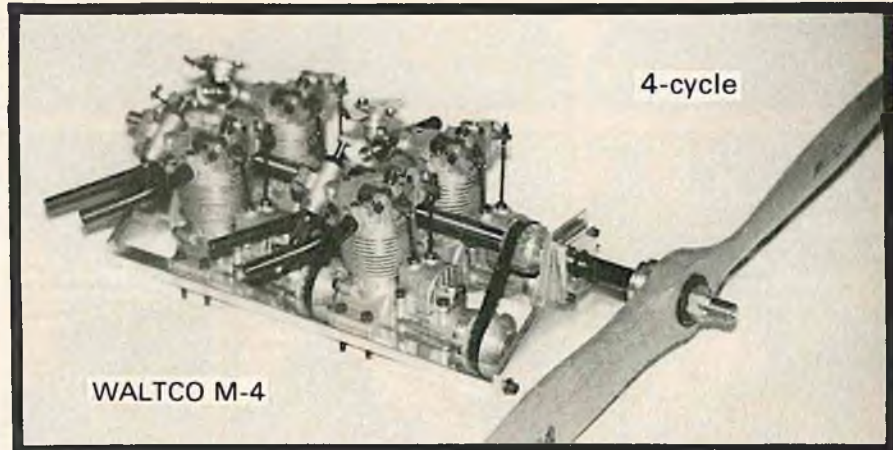
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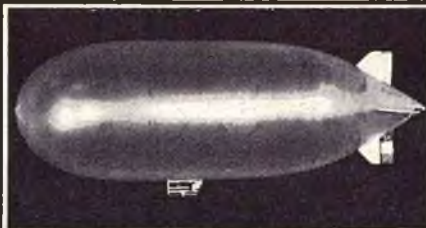
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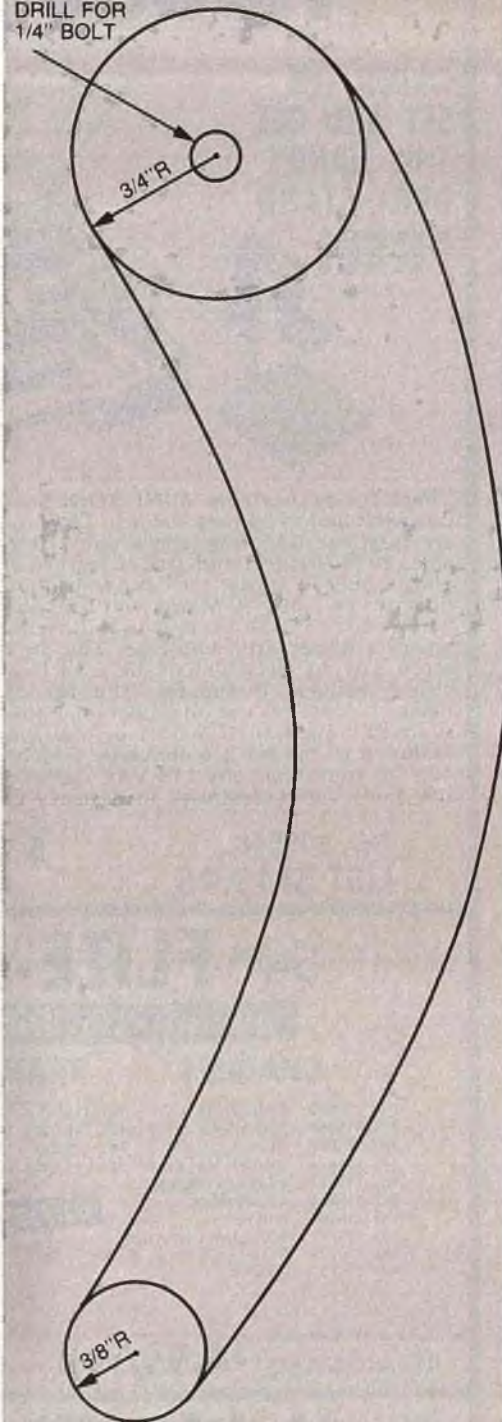
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"TWO MORE HANDS"

from page 105/104

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CUNNINGHAM ON R/C

Chuck Cunningham



Chuck Cunningham's Southwest Jumbo Fly-In

The Sixth Annual Southwest Jumbo Fly-In was a great success, just as the preceding five fly-ins have been. Despite weird weather all over the U.S. at the time of the Fly-In, 75 entrants showed up to display their aircraft and flying ability. At least 20 more entrants thought that the two day event would be rained out and, therefore, didn't make the drive to Forth Worth. We had rain, but it didn't last long, and the 75 who came, and the couple of thousand interested spectators, had a great time flying and looking. The top temperature for the first day, Saturday, July 16 was 81 degrees. Contrast that with the temperature

for the same day a few years earlier (1980) at 108 degrees, and you will see what fantastic weather we actually had.

This year — actually in an effort to control the crowd problem — I made no additional announcement of this fly-in other than in this column. No announcements were mailed out to past entrants, clubs, or hobby shops. All who came to see the Jumbo were there because they were interested enough to mark their calendars for this date and show up. Thunderbird Field is very large, and can accommodate a large number of people. It is situated in a Corps of Engineers park area adjacent to Benbrook Lake. The C of E is most concerned about safety, traffic flow, parking, etc. They are happy to provide the location for this outstanding show, but do not want it

to get too large. This year we had to provide "police" to keep the traffic moving, and to prevent any parking problems or traffic jams from occurring. Larry Conley of the Thunderbirds, became our traffic policeman, and did a great job of keeping everything clear. The point of all of this is that if we had advertised the Jumbo Fly-In to the general modeling public, and the public as a whole, we would have been inundated with a least ten thousand spectators — impossible to handle.

This year (as in all past years) the Jumbo Fly-In was hosted by members of the Forth Worth Thunderbirds. Enough cannot be said about the great guys in this club who year after year provide help whenever it is needed. For the past several years, members of the North Texas Miniature Aircraft Association pitched in to help. We had



Kerry Hunt, Lake Jackson, Texas, brought two. A 92" span Corsair at 32 lbs. with Quadra on prop drive. Also his CAP 21 with 80" span at 16½ lbs. with Quadra. Both had Kraft radios.



Bob Brooks, Houston, Texas, had this Quadra powered Delta with 86" span, 18 lbs. and Kraft radio.



Nelson Holden, Haughton, Louisiana, had nice Stearman PT-17 at 30 lbs. 98" span and powered by 50cc Quadra. Futaba radio was the guidance system.



Joe Smith, Denison, Texas, showed his Liberty Sport biplane. Weighing 23 lbs. with 94" span, a Roper 3.7 does the power using an MRC radio.



Jerry Hepper, Burleson, Texas, had an unnamed four engine biggie with a span of 94", 18 lb. weight and sporting four HB-40's. Used Futaba radio.



The owner of this nice J3 Cub is unknown to us.



Larry Stanley and John Mobley of Bossier City, Louisiana, had this superb Stinson Reliant. It was scratch built at 126" span, 35 lbs. and using a 50cc Quadra for power. Futaba system for guidance.



Woody Frantz, Tulsa, Oklahoma, scratch built this 102" span Kinner Sportwing at 21 lbs. with a 2.3 Cobra. The wheel pants have been detached and Woody uses a Kraft system.



Warren Garoutte, Randolph AFB, San Antonio, Texas, brought his 66" span Tiger Moth. Powered by O.S. .60 4-stroke at 7½ lbs., is guided by a Futaba radio.



Ed Sochor, Ft. Worth, Texas, built this Christen Eagle. Spans 65", weighs 18 lbs., powered by Tartan Twin and uses a Futaba radio.



Larry Jensen, Ft. Worth, Texas, displayed his Clipped Wing Cub. Wingspan 86½" with a Webra 90 and weighing 12½ lbs. Larry used Kraft equipment.



Mike Pugh, Orange, Texas, with his 144" Rearwin Speedster at 38 lbs. and using a 3.5 Kawasaki. Mike uses a Kraft radio.



Walt Hendon of Tulsa, Oklahoma, arrived with his Fleet Bipe at 24 lbs. with a span of 87" and Kraft radio.



Pat Massey, Pampa, Texas, had this superb 80" Rose Parakeet with an Evra 190 and weighing 24 lbs.



Rusty Allen, Logo Vista, Texas, with his Balsa USA Sopwith Pup. With a 108" span, a Kioritz up front, it weighs 28 lbs. Rusty uses a Futaba radio.



Chuck Cunningham, Ft. Worth, Texas, showing his 84" Turbulent at 11 lbs. with O.S. .90 and JR radio. In background is Lazy Ace, 76" span, Webra 90 at 11½ lbs. with EK radio.



Jerry Gardner, Ft. Smith, Arkansas, arrived with his Fly Baby Bipe at 20 lbs., Quadra powered and using a Kraft radio.



Bill Blackford, Bethany, Oklahoma, built this 72" span Aeromaster. Weighing 19 lbs. with a Whirlwind and Kraft radio.



Sidney Smith, Carrollton, Texas, has this beautiful Maul Lunar Rocket. Wingspan at 96", weight at 21 lbs. using a Quadra and Futaba radio.



Air-Tech of Little Rock, Arkansas, with their line up large aircraft. Sorry, no info given.



Walt Hendon of Tulsa, Oklahoma, getting Fleet towed back to pits with R/C truck.

a special tent set up to encourage membership in the IMAA as well as the NTMAA. The Jumbo couldn't get along without the help of all of these fliers. In a change from past years, this year a new sponsor stepped forward to help make this outstanding event even more outstanding. Miller's Distributors of Forth Worth and Tarrant County, local distributors of Miller's Beer, joined in the fun and provided many of the giveaway and door prize items. The door prizes went to registered entrants on a "draw the name from the hat" basis. We passed out a portable TV/AM/FM set, donated by Sky Master Industries; a Whirlwind 26 engine, donated by A & M Model Supply; two five channel Futaba G series radios, donated by



Line up of a portion of the models. Note the wide open spaces for a great Fly-In.

Miller's Distributors; a Jomar coupler, donated by Jomar; and lots of goodies provided by Miller's Distributors --- Black Satin "High Life" jackets, foam drink coolers, etc. Along with these items we had our usual beautiful trophies for Most Outstanding Aircraft, first and second; Best Scale, first and second; Best Non-Scale, first and second; and Entrant from the

Farthest Distance. Again, California took this as Rex Johnson from Sunnyvale, California, flew in to fly in the Jumbo and to sell his very fine Accu-Tach I product.

A feature that was added to the Jumbo several years ago is to raffle off a fine radio for nominally priced tickets. This year we raffled a Futaba

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7 channel G series radio; the winner was Warren Garoutte from San Antonio.

As most of you know, I am strongly opposed to putting the arm on model shops or model companies to provide prizes for contests. The first several Jumbo Fly-Ins lost money. Then we decided to sell raffle tickets and this decision put the Jumbo in the black, has paid back all of the past year's deficits, allowed for an increase in trophies, and will provide a beginning point for next year. So, for all of you contest directors who are hard pressed to make ends meet, give this some thought. You must balance off the number of tickets that you expect to sell against the cost of the raffle items as well as the ticket price. A small gathering simply won't support an expensive raffle item — you will have to be the judge.

Enough of business, let's get to the aircraft. This year we didn't have as many registered aircraft as last year, although we had more entrants. We also had fewer models that were displayed, but not entered. The models were of all types and sizes. As this facet of the R/C hobby/sport grows and ages, you tend to see more kit-built models and less of the innovative scratch-built types. Good or bad, this is the trend that will be seen in the future.

There are many fine kits on the market today, as well as many fine plans, so duplication is bound to exist. Even so, we had many interesting aircraft that were one of a kind. An example of this is the 8'-6" Kinner Sportwing model built and flown by Woody Frantz from Tulsa. This is a beautiful model and a fine flying aircraft, and one that you won't see too often. Woody has plans available so if you're interested, write to Woody at 9126 E. 67th Ct., Tulsa, Oklahoma 74133.

Another of the interesting models to show up at the Jumbo was a 12' span Rearwin Speedster pulled along very

realistically by a Kawasaki 3.5 engine.

One of the hits of the two day show was the four engine (four .40 size engines) 94" span, totally non-scale model entered and flown by Jerry Heppel and Tennis Cornum. The landing gear on this bird was designed much like the main gears on a 747, with ten wheels to support the weight. With those four .40's humming in sync, it was really something to see blasting off into the sky. Jerry and Tennis took an old Big Daddy kit and greatly modified it. If they hadn't told me, I wouldn't have recognized it.

FREQUENCY CONTROL COMBINATIONS

Each grouping goes on one clothespin. Only one of these frequencies can fly at the same time.

38	72.550 (orange/gray) 72.080 (white/brown) 72.960 (white/yellow)
12	72.030 (brown/red)
40	72.590 (yellow/black)
42	72.630 (yellow/red) 72.160 (white/blue)
44	72.670 (yellow/yellow)
46	72.710 (yellow/blue) 72.240 (white/red)
48	72.750 (yellow/gray)
50	72.790 (green/black) 72.320 (white/purple)
52	72.830 (green/red)
54	72.870 (green/yellow) 72.400 (white/orange)
56	72.910 (green/blue) 75.640 (white/green)

All of the 53 mhz frequencies can be flown with a bit of interaction on some, but not very much.

Another example of a very successful kit modification.

Of course, the big noise this year is the Laser 200 and the CAP 20, and these were at the Jumbo in abundance, along with what is now an old standby, the Byron Pitts. New to this aerobatic scene, but due to dominate for a few years, is the Christen Eagle. All of these aircraft are very aerobatic and really look super in the air, but my all time love is still the biplane, and many of these were in evidence. These included a couple of Lazy Aces, a beautiful FW44J flown by Bill Nickell, a very original Japanese "Willow," early WWII Japanese trainer flown by Don Williams, a larger than normal

Stearman Trainer by Nelson Holden, a beautiful Rose Parakeet by Pat Massey, several Fly Baby bipes, including a really beautiful one by Jerry Gardner, an outstanding Fleet by Walt Hendon, and so on.

For me, one of the most interesting models at the show was a Fokker Triplane, built by Keith Davis. This 48 lb. bird was powered by a Hodaka 100cc engine. Due to the cross wind conditions on Saturday, Keith elected not to fly. Unfortunately, the young photographer who I had enlisted to take pictures of the Fly-In did not show up on Saturday and thus missed taking shots of many of these outstanding aircraft. As is usually the case, lots of entrants come from long distances to be in attendance on Saturday, and start for home on Sunday morning. Excitement is always much less on Sunday. Forgot to mention that two Starlet bipes were at the field as well as a 72" span scaled-up Aeromaster. All in all, the bipes probably equalled in number the monoplanes.

WWII types were not as plentiful as in former years, but a couple of Corsairs kept the skies alive. Once again, Rusty Allen came with his Sopwith Pup. This aircraft was totally demolished last year at the Jumbo when one pilot was passing the transmitter to the other and, in the cross-over, the power switch got flipped off. Rusty completely rebuilt his bird with such care and craftsmanship that you could never tell that it had been thoroughly crunched.

Sunday morning we lost a couple of aircraft to a freak frequency problem. In the Forth Worth/Dallas area, as in most major metropolitan areas, many of the older R/C frequencies have been given over to paging systems. Many of them have not yet come on stream. We knew that 72.240 (red / white), 75.640 (green / white), and 72.960 (yellow / white) were pending. None were yet in operation, but that Sunday morning they chose to do a little testing, because a couple of red/white aircraft were dispatched from the sky, while another on the ground got so many fannies that it looked like it was trying to turn inside out. Next year no aircraft will be allowed to fly at the Jumbo on any of the old frequencies.

It is our understanding that the narcotics division of the Texas Highway Department has taken over 72.080 (brown / white) with a 1500 watt transmitter. You may be able to fly at home on these frequencies, but if you get around a city, it's going to be a problem. It really doesn't matter if you're planning to come to the Jumbo or not, if you're on the older frequencies, best to make a change

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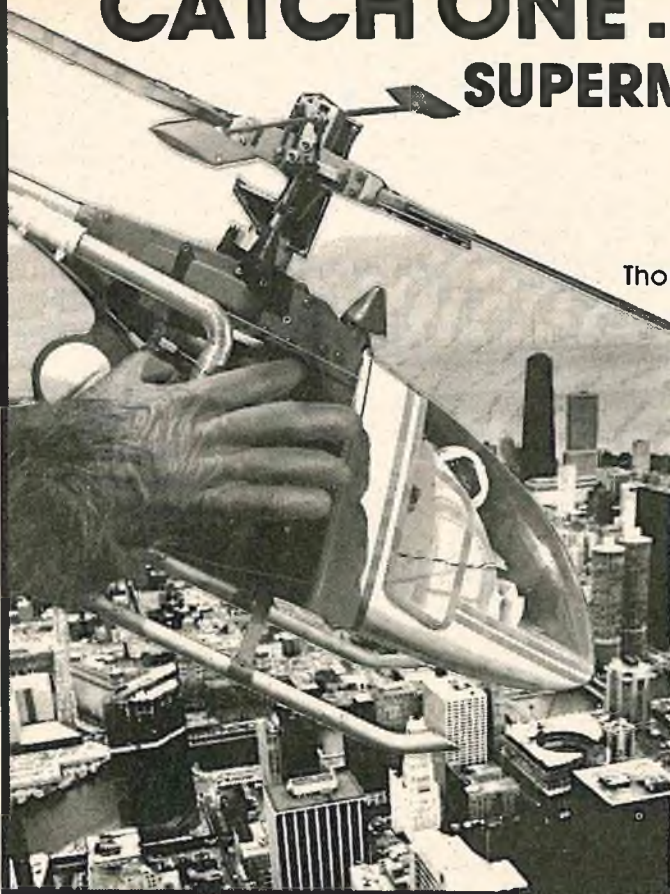
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now. The channel isn't yours any longer.

Speaking of frequencies, we worked out a system of combinations of both old and new frequencies on the same pin that kept any overlapping interference from causing a problem. We set up three frequency boards (though it could have been combined into one, three for ease in transportation). All of the old 72-something frequencies were combined with the new channel frequencies according to the accompanying chart. As you know, or should know by now, many of the new frequencies will "hit" the older

frequencies and, in one case, two of the new ones will hit each other. Combining these onto a common pin eliminated the possibility of frequency overlap. With six aircraft in the air and hundreds of flights made each day, it was necessary to make these combinations. The pins were standard clothespins with a piece of 1/8" plywood Hot Stuffed to one leg of the pin. Each pin carried markings for all of the frequencies that it controlled. The pin board was lettered in a similar manner. If you wanted to fly on channel 42, for example, the pilot on 72.160 had to wait until you were through or, if he was flying, you had to

wait. I suggest that all larger meets, as well as many of the active flying fields, use similar control methods.

Meanwhile, back at the Jumbo. This year's event was very typical of all past years. The weather was both good and bad; the flying skills were both good and bad. The quality of aircraft is ever-improving. The age of the builder / flier is also increasing, though some of the younger guys are trying out the larger machines. The friendships and good times enjoyed by all who attended will be remembered for a long time. I really do enjoy this chance to see guys from all over the southwest

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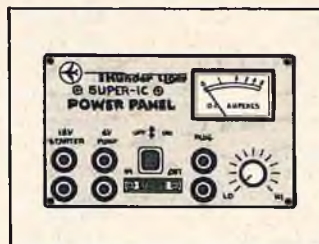
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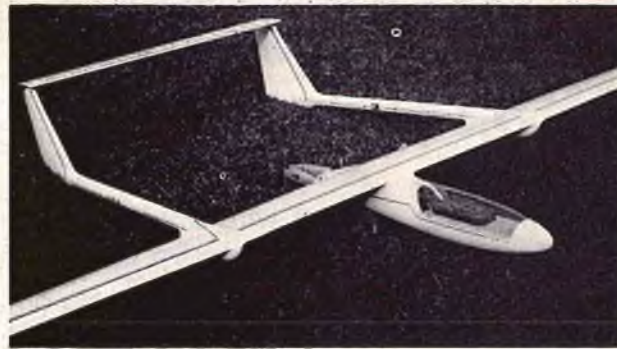
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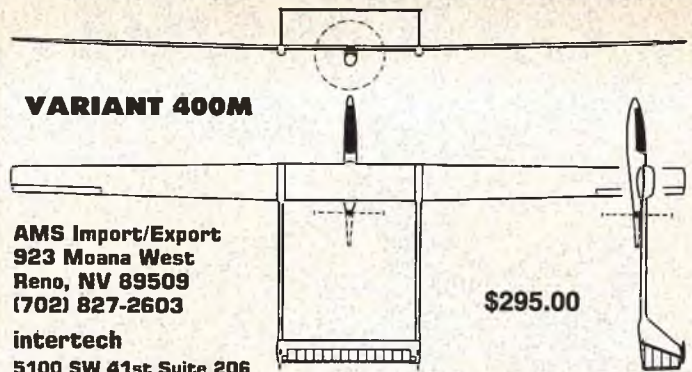


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once a year and to renew friendships.

I always enjoy watching Bob Brooks of Houston, because Bob always does something different. This year he had designed a Quadra powered delta wing just for the Jumbo. This aircraft was a super flier. Bob let me have a bit of stick time on it Sunday morning. Bob flies the single stick transmitter, and it hangs from his neck by a lanyard. When we changed over (from Bob to me), I grabbed the transmitter and started flying, when suddenly I noticed that Bob's nose seemed to be glued to the transmitter case. It suddenly dawned upon me that the lanyard was still around his neck. Kinda hard to tangle and untangle. Bob's left arm was parted from him some years ago and he does all of his building and flying with just his right hand, and does a super job of both. A second delta was at the Jumbo — a scaled-up Force One, built by Bob Wooten. This also proved to be an excellent flying machine with a standard Quadra for power.

Old friend Johnny Clemens, current District VIII AMA Vice President, was on hand Sunday morning to take in the fun. Johnny served as AMA President for the unheard of total of eight years, and has devoted his life to modeling. A game leg has kept Johnny from seeing as many folks in this

district as he would like to, so the Jumbo gave him a chance to come face to face with lots of his friends.

The winners in the several categories were: Most Impressive Model, Pat Massey, Pampa, Texas, with his highly detailed scratch designed and built Rose Parakeet. Second Place Most Impressive Model went to Jerry Heppel and Tennis Cornum and their four engined bird. Best Scale, First Place, went to Kerry Hurt, Lake Jackson, Texas, with his F4U-4 Corsair, powered by a Quadra on a reduction system --- it pulled this 32 lb. bird simply great. Second Place in Scale went to Walt Hendon with his Fleet Biplane. This aircraft was towed to the flight line by a small radio controlled truck. The truck unhitched itself from the biplane once it had the aircraft in the correct position, then moved off of the runway. The engine was started by an onboard starter, and this beautiful Fleet went off into the wild blue yonder. Walt calls Tulsa, Oklahoma, home. Best Non-Scale was awarded to Bob Brooks of Houston, for his delta. Second Place in Non-Scale went to John Westbrook of Little Rock, Arkansas, for his Air Tech Crop Duster. Frankly, I'm glad that I didn't have to do the judging — tough decisions.

Judging was ably handled this year

by Dave Alter, Curly Rucker, Don Langer, and Don Winfield. Flight line safety was taken care of by Helmer Johnson, Bill Slater, Curly Rucker, and several others. Al Willert and Ron Ables took care of safety inspections on over one hundred aircraft and, as usual, saved several crashes by detecting unworthy flight conditions. John "Knob" Eddyhausen and Ben Ludwig rode herd on the frequency controls and flight line rotation, a really very tough job. Registration and ticket selling were handled by that dynamic duo, my wife Jan Cunningham and daughter Cindy Cunningham. Without these two great gals to do all of the hard work, I'd find it awfully tough to spend lots of time talking on the PA system and tending to keeping things going. Bob Martin did a great job of getting the grass cut down in the pit areas and around the field. I want to again thank Pat Craine of Miller's Distributors for getting involved in the Jumbo Fly-In. They were surprised at all of the activity and felt that they got much more than they had bargained for in the way of advertising.

Again, it was a super Fly-In, and we're going to get moving on the Seventh Annual Jumbo Fly-In for 1984.



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THE EYES HAVE IT!

By Col. John A. deVries

According to the rules, scale R/C models, entered in competition in the USA have to have a "pilot" sitting in the cockpit. Have to admit, scale models in flight need to have something behind the windshield that looks like "somebody" is flying the model. Of course, it's you, with transmitter in hand, who's really doing the flying, but, even if you're not an avid contestant, the "little pilot" adds an air of realism.

The crudest way of "solving the little pilot problem" is to stick a people profile in the cockpit. At a distance, who's to know? Most of us, however, opt for a three dimensional representation of a scale pilot. And, because they're available in a number of scale sizes, many scale modelers purchase the plastic pilots offered by the Williams Bros. They're handy, available at most hobby shops and don't take too much work to look good in our models' cockpits. A bit of paint, after gluing the two halves together, and our "pilot" is ready for installation. But --- most of us aren't "into" painting the little figurines so our pilots end up being a bit crude. Particularly, painting the eyes of the Williams Bros.' pilots poses some difficulty to the average R/C scale modeler. A blue or brown blob, swimming in an irregular pool of white paint is the way to describe the usual eye paint job. The pupil-less gaze of the plastic airman gives the impression that rigor-mortis has set in!

There is a way around this problem that produces a much more realistic set of eyeballs for the expenditure of a buck or two and half an hour of work. And --- I would never have found it if I hadn't taken my wife to a doll show! As a doll collector, she often has to "re-build" her little friends. Bits and



Williams Bros. "pilots" --- the front halves as they come out of the package. Quarter-scale on the left, 2 1/2"-scale on the right.



Note the cockeyed "stare" of a Williams Bros. with painted eyeballs --- two blobs of blue, floating in pools of white paint!



Both "pilots" with their plastic eyes "opened." Pencil points to 8 mm doll's eyes to be used in the quarter-scale pilot. Note how the plastic has been scraped away in the larger casting --- to provide realistic eyelid thickness.

pieces of dolls are manufactured specifically for this purpose --- particularly, eyes. It's kind of unnerving, gazing down into a compartmented box, full of tiny eyeballs --- but that was our inspiration. The "doll people" offer "eyes" from 2mm to 22mm pupil-diameter in three general types. There are "full eyeballs" and slab eyeballs, the latter in acrylic (plastic) or glass. The "full eyeballs" aren't useful to us but the slab variety are. The acrylics range in price from a dollar a pair for the smallest sizes to \$2.50 for the largest ones. Glass eyes cost five times as much, size for size. At the show, I purchased three different sets of eyes --- 4, 8 and 10mm, in acrylic.

The next day, I was at the hobby shop soon after it opened. I bought two Williams Bros. "pilots" --- in 2 $\frac{5}{8}$ " and 3" scale. The first order of business was to drill out the plastic eyes of the pilot figurines. It seemed cruel at the time, particularly when I attacked the castings with needle files. Had to be careful and leave the molded eyelids in place while removing most of the "pupil"/eyeball plastic. When I first trial fitted the doll's eyes in place, I **knew** I had something!

I then attacked the front half of my pilots with a Dremel tool, thinning the plastic **behind** the eyeball area so that the acrylic eyes could be positioned properly. For the latter stages of fitting, I used a convex wood carving chisel to scrape away the plastic to paper thinness. As I worked, I held the pilot up to the light to make sure that the plastic was being removed evenly. The thinner the better, because the eyelids take on a realistic, translucent appearance.

Before I glued the doll's eyeballs in place, I painted the eyebrows and eyelashes with matt brown enamel. Found after the paint had dried, that by scratching the eyebrows with the



Check the sparkle in the eyes of the modified Williams Bros. pilots with acrylic doll's eyes glued in place!

back side of the point of a No. 11 X-Acto blade, the eyebrow hairs could be simulated rather well. The same techniques worked with my pilot's "mustache."

Gluing the eyeballs in place was a bit tricky --- to center the pupils between the eyelids and to make sure that my "airplane driver" wasn't cross or wall-eyed. The curve of the inner eyelids of the pilot didn't match the curve of the eyeball exactly, but it was relatively easy to **tape** the slab eyes in the proper position. The eyeballs were glued in place, from the **front**, using the point of a pin to apply the "Plasti-Zap" to eyeball and eyelid. What a difference! My pilots now had eyes with pupils and the tiny black streaks in them. The "whites" of the eyes had the proper degree of gloss and a proper degree of "blue" in them. For the record, I used the 4mm eyes for the 2 $\frac{5}{8}$ " scale pilot; the 8mm for the quarter scale version. Measurement indicates that the 2mm dolls eyes will be right for the 2" scale Williams Bros. pilot and the 10mm size about right for a 1/3rd scale size "driver." The eyes are available in blue and brown --- the

blue pupils are a bit more realistic for our purposes. Most doll shops of any consequence carry the eyeballs as do "doll hospitals." If your town doesn't seem to offer 'em, you can mail order them in acrylic or glass from: International Marketing and Sales (IMSCO), 950 N. Main St., Orange, California 92667.

Before completing and painting our scale pilot, there's one more task to perform to set off our "eye-job." If we're working with the Standard pilot, we've got to fit the goggles. As furnished by the Williams Bros., the goggles require cutting, filing and scraping the goggles to make them fit properly --- **down** on the pilot's nose. This fitting is necessary to align the pilot's eyes with the **center** of the goggle(s). If the goggles ride too high, it gives the pilot a rather malevolent look; too low, and he's "blinded" by the simulated rubber rims of the goggles.

The "eyes" do have it --- so give our technique a try. The "doll people" also offer tiny **wigs**. So, our next project will be trying to find one that fits the Williams Bros. "Sportsman" pilot --- and then giving him a **haircut!** □



With a matte overglaze (protect the eyes!) this pilot will look great after he's been painted. He'll "appear" in the author's Quarter Scale Comper "Swift" which is a building.



Standard pilot goggles being painted after they've been trimmed and fitted to the pilots' faces. Doubled masking tape holds them for paint and Scotch tape protects the "glass" portions.

BIG IS BEAUTIFUL

Dick Phillips



Have you ever used a method of building for many years (or a material, or an idea or almost anything) and had someone say to you one day, "Boy, that's a great idea, I'm going to start doing that too!" I'm not going to suggest to you that I have brainstormed every fifteen minutes and develop or invent something new. It just isn't true... however, I've been around this hobby for a good many years and have formed some ideas and habits over the years which work for me and they are so comfortable and work so well for me that they're like that old sweater you



1/5 Scale Curtiss Fledgling designed by Len Bosman of Vancouver, B.C. Len's designs are all intended for the Quadra 35 cc engine, plans available see column for details.

wear out to the flying site and have done so for years, you don't give it a thought.

Such an item is the material I have

been using for some time for those areas in a model which were glass (or some clear plastic material) in the full scale and which we represent by some clear plastic material in the model. One of the problems with these materials is that they are fairly stiff and don't shape well without the use of heat. They also tend to crack with vibration and shatter rather violently when they are involved in a collision, and will discolor in prolonged exposure to sunlight.

My suggestion for a replacement for the hard plastic is the somewhat softer, more pliable material used in convertible car and boat tops. While this material will discolor with long exposure to the sun, it won't get that same exposure in a model as would be the case in a car or boat and will last a good deal longer. It glues very well with both Wilhold's RC/56 and with the cyanoacrylates. The material I have is about 1/32" thick (actually .062) and is stiff, but much softer to the feel than the usual clear plastic we use for windshields. It's a bit too soft to use for un-supported windscreens such as would be the case with an open cockpit biplane, but framed, it works very well. It is also much less costly than the other material. I bought ten bucks worth of it about three years ago and still have enough left to do a half dozen airplanes.

It will take mild compound curves a lot better than the stiffer material will and, for that reason alone, I'd use it even without the other advantages mentioned. Next time you have to replace some 'glass' in your repair job, get down to the local boat top or convertible repair shop and try a piece of this material. Auto glass shops often carry it for the repair of convertible tops so give them a try if you can't find it anywhere else. It's great stuff! And very reasonably priced.

Local modeler Peter Cary has a new

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model which is a bit out of the ordinary. It's a model of an ultra light, powered with a weedeater engine of about .8 h.p. The main fuselage member is a shaft from a broken hockey stick and Peter claims he is currently writing a book called, "101 Uses for Broken Hockey Sticks." Only 100 more to go, Pete! The model flies verrryyy slowly and fights for altitude measured in inches, does not fly in any kind of wind at all but is great to watch. The pilot figure is made from styrofoam for lightness and Mrs. Cary made his costume, also very light. More power could be used, but it attracts a good deal of attention whenever flown as it is and adds to the variety of models at any rally or club event. Building such a model at Quarter Scale should not tax the ability of anyone, with the possible exception of rigging the myriad of flying and landing wires required to keep it all together. It's a pretty neat machine.

I was fortunate enough to run across some new and un-publicized plans recently on a visit to Vancouver B.C. As most of us will do when visiting a city far from home, I dropped into a hobby shop to say hello and to see if there was anything there not being carried by the shops I get into from time to time here at home. You can never tell what you are going to 'need', can you?

While there I picked up a copy of the local club newsletter, the "Glib Glitches" published by the Radio Control Flying Club of B.C. (R.C.F.C.B.C.). The front page featured a short article on a local project, the construction of several Fleet Finches. The full sized airplane was a commonly used trainer in the early days of B.C. and I had recently read up on it in a history of early flying in that Province, so was interested in the model. Several members of the club had construction projects on the go at that time and a number of them have been completed and flown.

I was able to contact the designer later and that contact turned out to be a bit of a bonanza. He has a number of plans available and is prolifically still at it and will have a number of others by the time you read this. The designer, Leonard Bosman of Vancouver, is no stranger to large models. He sent me a copy of a photo which appeared in MAN in June of 1947 (while he was still living in Holland) of a model with a span of at least 10'.

His current crop of plans available include an Interstate Cadet of 116" span meant for the 35cc Quadra; The Fleet Finch, 84" span for 35cc Quadra; Ryan PT-16, 90" span for the same engine. All three are Quarter Scale.



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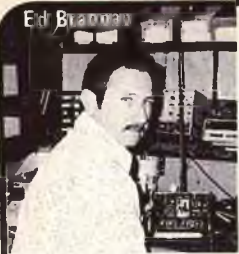
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Dick Wangler

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Len is a native of Holland and the model mentioned above as having appeared in MAN in 1947, was the first radio controlled model in Holland after the war. It was actually 12' in span and powered by a German drone engine of 30cc, a bit smaller than the present 35cc Quadra. Len tells me he, at that time, had contacts in the Dutch Fokker Factory and managed to obtain most of his materials at little or no cost through his contacts. The large model was flown at a public airport dedication in Holland and was an instant success, not to mention years ahead of its time. Len tells me that the small rudder was not very effective but that the model was so stable it flew very solidly. His current Fleet Finch project, about 20 of which are currently under construction within his club, is also a very stable flier and Len recently got the model airborne, sat the transmitter down and walked away from it. The model did quite well, thank you, with no help from the pilot. He also tells me the model does well with the 35cc engine and would probably be a pretty spectacular performer with the 50cc (or larger) engine on board. The Smith Miniplane to page 140

While I have not seen all of Len's plans, the ones I have seen are certainly quite adequate for the use of the average 'scratch' builder.

In addition, the following models have been built and flight tested and plans will be available shortly. Hawker Tempest, 78" span, 1/6 scale, for 35cc Quadra; Curtiss Fledgling, 96" span, 1/5 scale, 35cc Quadra; Fairey Firefly, 79" span, 1/7 scale, 35cc Quadra; Smith Miniplane, 68" span, 35cc Quadra, 1/3 scale; Fokker C-5, 96" span, 35cc Quadra. Naturally, most of these could also be adapted to take the 50cc Quadra with

an attendant increase in performance.

As if the above were not enough for one designer who appeared on the scene quite recently, Len has also been looking ahead and has the following models in the design stage and they too will be available in the foreseeable future: Waco YMF-3 75" span at 1/5 scale for Quadra power. This will be much as the Dave Platt kit was in the smaller size and similar to the current Pica 1/5 scale model in kit form. If you'd rather build it from a plan, Len will soon have one available for you. He'll also have a Hawker Sea Fury FB-11 at 80" span and 1/6 scale also for

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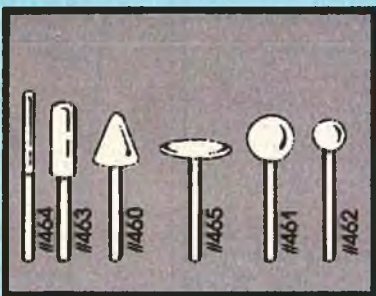
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Hawker Tempest, WW II Fighter/Intruder makes good looking model. You won't see one of these at every Fun Fly in the country. More in text.



Fairey Firefly is another slightly off-beat WW II machine. Nice to see some of these less well-known machines becoming available as a little relief from the ubiquitous P-51s and Spitfires.

at 1/3 scale, and with adequate power up front, should also be a very quick and agile model. Also, the Ryan, at 18 pounds and with the 35cc Quadra up front is very similar in performance to a pattern airplane I am told.

Whatever the case, it's a real delight for me to salute one of the real early pioneers of big who was well ahead of the rest of us, and who has returned to the larger model now that adequate engines and radios are available and done such an outstanding job. His plans are very good and I am sure we will be hearing a great deal more about Len Bosman in the future.

There is an interesting side note to Len's accomplishments. The design and building of the models mentioned was a result of the recession we have all been experiencing. Len's involuntary retirement from the workforce gave him the time to turn his talents to the design work. It just could be that he has started a second career which, judging by his workmanship, may well be very successful.

If any of the plans mentioned above turn your crank, drop Len a line at 193 Baltic St., Coquitlam, B.C., Canada, V3K 5G9. All plans will be available at a cost of \$25.00. No building instructions are available as such, but most of his plans have quite clear instructions on the plan itself. If you have had any experience building from plans in the past, you should have little or no difficulty with these. If you haven't had that experience yet,

as I've mentioned before, you could do a lot worse than start with a large model. The pieces are bigger and not so susceptible to loss or damage while the building process is going on!

There is also a possibility that Gordon Brechin, who was mentioned in an earlier column, will have semi-kits available for some, if not all, of Len's designs.

Speaking of plans, Jerry Behrens has not been idle lately. I picked up two of his new plans in Toledo back in April. They are the Waco UPF-7 and the Sopwith Pup, both at 1/4 scale. Those of you who read along each month know I am a Waco freak and having this plan (and planning to have Len Bosman's Waco YMF-3) will realize that I have just added two projects to the already long line of plans waiting to make it to my building board. I said a while back that I was going to have to live to be about 125 in order to get them all done . . . well, you'd better make that 150!

Jerry's very complete plans and instructions books have already turned out a good many models in the larger sizes and if he keeps up as he has been going for the past few years, there'll be a lot more of them. I have seen most of Jerry's plans although have yet to manage the time to build one of them. They are certainly adequate to the job, and even the beginner to building from plans should find his step by step instructions to be more than adequate to get through a construction project.

The addition of the plans mentioned in this column add significantly to the very large number already available and add a couple which are not your average run of the mill plan. While I have nothing against the P-51 and the Pitts, it is not unusual to see several versions of each of them at almost every Rally and Fun-Fly in the country, so a little variety is to be welcomed and it will certainly add to the enjoyment of attending such events to see some of the less common models make an appearance. Not to mention the very significant personal satisfaction derived from creating something of your own, even if it be from someone else's plans.

I've had the privilege of introducing a good many plans to you over the years and hope this will continue. It would be a shame to realize that there are many good plans around which have not had any publicity and which remain largely unknown except in a local area, let me know about it, it just could be there are a few of the rest of us who would be interested.

Our Second Annual Western Canada Giant Scale Rally took place this past weekend, and, while not the rainy disaster of 1982, it did catch a good deal of rain. Here in St. Albert, the Kinsmen Club sponsor a Rodeo late in June. It has come to be known as the "Rainmaker Rodeo" in that it has received large quantities of rain over ten of the past eleven years. If we have another year of rain on the Rally, to page 144



Peter Cary's Ultra-Light model. Not a rendition of any particular full scale machine, this approximate Quarter Scale model flies about the same as the original ultra-lights. That is to say, it fights for altitude and looks great in the air. More in text.



This might look like a low fly-by, but with this model, it's close to it's service ceiling! Model looks great in the air and without the figure of Peter in the foreground, would be difficult to tell from full scale. Wheels are from a toy baby carriage.



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there is a good possibility it will become known as the Rainmaker Rally, or we may just schedule submarine races and be done with it! To the credit of the hardy, there were a number of fliers and they braved the rain and wind to put on a fine display of the modelers' art. Wilf and Reg Blackwell, the father and son team who sponsor the rally jointly with yours truly, rigged up a tarpaulin covered fire pit near the flight line and while it may have been wet and cool at times on the flight line, it was warm and comfortable under the tarp. An evening session of the Saturday night, which had been quite wet, was well attended with a great deal of hangar flying taking place along with a warming cup as well. As is usually the case, the hardy had a good time despite the weather conditions and those not able to handle the bad times stayed home! What's that saying? --- when the going gets tough, the tough get going.

There were a number of Byron's Cap 21's present, of which two bit the dust. The canopy on the model I saw go in was held in place by elastic bands and when one side let loose and the other didn't, the canopy ended up hanging around one side of the fuselage and apparently blanking out the airflow over the elevator and rudder. The very capable pilot in control at the time was unable to recover the model and it went in to severe damage. Until the accident, it was performing very well on its 35cc Quadra. The machine is a real mover and is very agile in the air, especially in the hands of a good pilot.

I had a letter recently from Lou Stary of Hawthorne, California. Lou's letter, in part, said, "I am presenting the following with tongue in cheek! Someone really ought to do an honest article on which engines are smooth and vibrationless. Seems as though guys like me, too old (66), too inexperienced and with enough dollars to buy a 'reasonably' best engine, say for a Nosen Aeronca Champ type model. One 'vibrator' I saw did a fine job on most all of the glue joints of a fine model."

Now I'm sure Lou is old enough to know that there is no such thing as a totally vibrationless single cylinder engine, at least not a reciprocating engine. The mass moving inside a single cylinder engine is enough that there is just no way the vibration can be completely damped out. In fact, I am informed that chain saw engines are deliberately left in a partially undamped state as the vibration improves their cutting ability and that could certainly make a problem for us.

I am still convinced that a Dario balanced Quadra 35cc engine is the

so-called 'perfect' engine Lou talks about. It's not perfect, of course, but if all things, including the dollars, are considered, it's about the best there is, for the buck. It's certainly well worth the cost of having Dario work his magic on the engine. I currently have three of them and would not consider running them in a model without the balance job being done on them. More accurately, what Dario does is 'over-balance' the engine so that the moving masses tend to cancel each other out and it works. Not perfectly, of course, but it does work well, about as well as we are going to see here on earth anyway.

Roush Manufacturing's new little twin will be as near perfect as is possible in that the engine is a simultaneously firing twin and the masses will all but perfectly cancel one another. It isn't going to be cheap, however, but I suspect there are going to be a lot of us willing to pony up the bucks for a 3.8c.i. (about 4-5 hp) engine that will be as smooth as the twin is.

That's it for this month. Remember, if you spend some time in the shop making sure everything on your model is as good as you can make it, you'll spend a lot less time at the field fiddling and more time flying! □

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ENGINE CLINIC

Clarence Lee



Due to the length of last month's report on the new HP 21 four stroke engine, I had to forgo answering any letters. Although it will be November when you read this column, it is being written in the middle of July when the mail load is at its heaviest. This month we will get right to the letters and try to get caught up a little.

Our first letter this month is typical of many I have been receiving lately regarding break-in procedure so I will elaborate a little bit on this topic.

Dear Mr. Lee,

I enjoy your advice and now wish some for myself.

I purchased an O.S. Max 40 R/C recently and am interested in the changes made in breaking-in an engine since I left the hobby more than 12 years ago. Now the manufacturer only states that a good, rich run while flying for a few tanks is enough. What has been your experience with this? Also, suggestions on good sport fuel?

*Thank you,
Ed Lane*

Los Angeles, California

Over the years, break-in procedures have changed considerably due to better tolerance control on the part of the engine manufacturers, changes in metalurgy, types of materials used, etc. The most notable here being the ABC (lapped aluminum piston and chrome plated brass sleeve) and AAC

(lapped aluminum piston and chrome plated aluminum sleeve) type engines.

Break-in procedure can be divided into three groups. Engines using lapped iron piston (which are usually of the small displacement type), engines using ringed aluminum pistons, and the ABC/AAC engines.

Most engines using lapped iron pistons will require more break-in time, before coming up to full power, than the ringed and ABC/AAC engines. It is generally best to give a lapped iron piston engine some bench running prior to installing in the aircraft. The test stand should be up off the ground where no foreign matter can be digested by the engine. A tank or two of fuel should be run through the engine at a very rich setting. Towards the end of the tank, the engine should be leaned in momentarily and then richened right back up. This procedure should be repeated until the engine will hold a rich two cycle setting without slowing. It is then okay to install the engine in the aircraft. Do not prolong the ground running. You can break an engine in much faster by flying than on the test stand. The first flight should be very rich. The second flight a click or two leaner. If the design of the aircraft and the flier's ability permits, big loops, Cuban eights, etc., should be performed. Any prolonged climbing maneuvers that might lean the engine

out should be avoided. This includes those 60° take-offs. Generally by the sixth or seventh flight, the engine should be able to be run in a slightly rich two cycle. Do not let this fool you into believing that it is fully broken-in, however. It should be kept on the rich side for the first gallon of fuel, in the case of a .60 size engine; and half a gallon of fuel in the case of a .35 or smaller size engine. A mild sport fuel with 5%-10% nitro content should be used. A little extra oil can be added to the first gallon of fuel if you want. One or two ounces of castor oil to a gallon is sufficient. For you guys with a tin ear when it comes to determining whether an engine is rich or not, the extra oil is highly recommended.

Ringed engines generally do not require any ground or bench running. They can be flown right out of the box, but the first flight should be very rich, second flight a click or two leaner, etc. Like the lapped iron piston engine, big loops, Cuban eights, etc., should be performed. The idea is to keep the engine working as it will break-in much faster. By the sixth or seventh flight, most ringed engines will hold a slightly rich two cycle and be capable of performing the complete AMA/FAI pattern. However, they should be kept on the rich side for the first gallon of fuel and any lean runs avoided.

The ABC/AAC engines require very little in the way of break-in. You just run them a little on the rich side for

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the first half dozen flights. Unlike the lapped iron and ringed aluminum piston engines, you do not want to run an ABC/AAC engine extremely rich. These engines have the piston fit tight at the top of the stroke to allow for differential expansion rates. The sleeve grows or expands more than the piston, the hotter the engine gets. This eliminates any seizing or sticking-up of the engine. If run too lean, the engine just slows down, which is one of the big advantages of the ABC/AAC type engines. While cold, the piston will be tight at the top of the stroke — just a little tight for engines using sport fuels, and very tight for high nitro racing engines. At operating temperature, the correct running fit is achieved. If an ABC/AAC engine is run overly rich, the engine does not come up to operating temperature and the fit remains tight resulting in unnecessary wearing of the piston. You also do not want to vary nitro content with an ABC/AAC engine. That is, use lower nitro for break-in and then high nitro for racing, etc. Operating temperatures and operating clearances will be different. The same fuel should be used for break-in that will be used following break-in. This is also true with racing type ABC/AAC engines. If you are going to use 60% fuel for racing, then the engine should be broken-in with no lower than 50% nitro fuel. A lot of fellows have had rods break in ABC racing engines while running them slobbering rich on the bench with low nitro fuel, and wondered why. The tight piston was being jammed up and pulled down due to the engine not being up to operating temperature. So, just run an ABC/AAC engine in a rich two cycle for the first half a dozen runs for break-in.

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the market — Cool Power, K & B, Red Max, Sheldons, etc. I like the Cool Power as it seems to keep the engine cleaner than some of the others.

Dear Clarence,

I have been a subscriber to RCM for three years, the total, to date, of my R/C involvement. I think your column is the greatest source of information, in regards to engines and engine

problems, that is available. I hate to be so brief when asking favors and information but here goes: I am "itching" to get into 4-cycle engines for all of the good reasons but have only been able to catch bits and pieces in your column (such as flipping prop backwards to start). So . . . I am building an A & A (nee Nosen) 9' Citabria and have been told that an Enya .60 4-stroke will be ample power

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for this craft as it is more powerful than the O.S. Max .60 4-cycle — I would appreciate your comments on that.

I would also like to know prop sizes to use; will or should the engine be mounted inverted? (Does it make a difference with the 4-cycles as in the gas types? I read that the Quadras, etc.,

always run better inverted.) Is there any book available on 4-strokers that would answer most of my (the tyro's) questions? You also consistently state that "4-strokers" like a lower percentage of oil in the fuel. Our club uses Red Max 10% with all synthetic lube and as I am the only member

interested in 4-cycles at the present, can you advise what and/or how to get a good fuel mix — or will the 4-cycle run okay with the standard mentioned fuel?

Warmest regards,
Bob

Romney, West Virginia

The Enya .60 4-stroke does seem to have more power than the O.S. In fact, it is the strongest .60 4-stroke at the present time. It should fly your Nosen Citabria fine but do not expect to do vertical rolls, etc. Prop size will take a little experimentation but I would start with a 14/6.

I would not recommend mounting a 4-stroke glow ignition engine inverted. 4-stroke glow engines are pretty marginal on idle to begin with and mounting inverted, where the glow plug just becomes a sump for fuel and oil, is just asking for problems.

Most 4-stroke engines run best on 8%-12% oil content fuel. I would start with 12% and decrease to 8% after the engine is broken-in. If any heating problems are encountered, then increase the oil content. Generally, a fuel mix of 10% oil, 10% nitromethane, and the balance methanol, works fine in 4-strokes. Your commercial fuels can be cut 50/50 with alcohol but remember that the nitro content is being cut 50% also. So, if you start out with a commercial fuel that has 10% nitro, you will only have 5% after cutting. Some 4-strokes work fine on 5% but most seem to idle and accelerate better with 10%.

Dear Clarence,

First of all, let me thank you for all the excellent info I have gained over the years from your articles in RCM. Many of my own questions have been answered by replies to letters others have written and you have answered in your column. Keep it up, it's excellent.

I have a question of my own that has me somewhat stumped. I was flying my Kadet II the other day which has a K & B .40 in it that up to this time had always run great. This engine has over 200 and some flights on it and I rebuilt it about 20 flights ago with a new rod, ring, and piston and it picked up where it left off running great.

The problem was that it would be flying along at full throttle and suddenly drop back to an idle which could not be affected by moving the throttle back and forth. The engine did not quit and, after awhile, it would sometimes go back to full again for no known reason. Unfortunately, it did it when I was in a bad position for landing and I made the age old mistake of trying to rev the engine back up and land downwind at the same time. Conclusion: I put the plane in kit form (repairable) and bent the shaft on



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the engine in the process.

I was using the same 10% fuel I had always used. I checked the tank for dirt and cut open the filter to see if it was clogging, and checked the fuel lines (all clean). I took the Irvine carb apart and no dirt was present. Also, the plug seemed to light okay. Any idea what might cause this?

An item for info: I purchased a new O.S. .90 last month and fired it up the other day to find I could not get it to idle at all. I tried everything I could to no avail and finally took the carb apart (the one that comes with the engine). On removing the idle valve and inspecting the "O" rings, I found that all three had flat places on the top and

bottom and the pieces were in the carb. I would presume that I was sucking air when in the idle position which is why I could get no adjustment. When I took the idle bar out of a new O.S. .61 I had and put it in the .90 carb, all was normal. It looked like the idle valve was put in dry and the tops shaved off from the holes for bolts that go through the rotor or the "O" rings were of poor quality. Anyhow, I ordered some from World Engines.

Thanks for your patience in reading this.

Sincerely,
John Hobson

San Clemente, California

It sure sounds to me as if you were

getting hit by interference. It is about the only thing that is going to make an engine go to idle and then back to high speed. Idle is the first channel to be hit by interference, followed by rudder. Most radio manufacturers set their radios up this way to give a little warning when interference is present. Vibration can also be getting to the radio so check your range on the ground with the engine running at full throttle. You might detect some throttle movement by doing so. Any dirt or foreign matter in the fuel would have caused the engine to go lean and die — not drop to idle. How about the range of the radio? Has it been less lately? Maybe your radio is in need of tuning.

Thanks for sharing the solution to your O.S. carburetor with us. Others may have experienced the same problem without realizing the cause.

Dear Mr. Lee,

I have a problem with my old K & B .40. It is constantly heating out the wrist pin holes in the piston and the small end of the con rod.

Since I've owned it, I have replaced the piston and ring once, and the pin and rod twice. In the last three years, I might have put a grand total of three hours running since new. I thought at first that the crankpin wasn't square, so I replaced the crank assembly (shaft, bearings, prop hub and front housing) at the same time I replaced the rod and pin. I ran the engine rich for about 10-15 minutes to break in the parts. After about a total of one hour, the rod and pin were shot. At this time, I noticed the piston pin holes were egged out. The engine sat for about a year and a half, at which time I replaced the piston, ring, pin, and rod.

The engine is now mounted in a Headmaster Sport 40, and I updated it with the new K & B metal carb. It runs great! Careful break-in procedures were followed, and after 1:15 there is now excessive play in the small end of the rod as well as the wrist pin holes.

Would you agree that the actual cause would be the cylinder sleeve hole in the case is not bored straight? That is all I can think of that would cause this.

Would you recommend that I return the engine to K & B for their evaluation?

I sure am buffaloeed by this problem! There's no black exhaust residue and I use 2 oz. extra castor per gallon. My other K & B .40 has about 35-40 hours and everthing's okay (probably needs a ring, by now).

Sure would appreciate your help!

Thanks,
Paul Donovan
Phoenix, Arizona

The wrist pin holes in the piston and upper end of the rod were always weak

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points in the old #8011 K & B .40. Any lean running or fuel that was a little shy on oil would cause rapid wearing at these points. The new K & B .40 #4011 that replaces the old #8011 has bronze bushings in the piston wrist pin holes and upper end of the rod, eliminating this problem. Parts for the new engine are interchangeable with the old.

Off hand, however, I would guess that you are probably running the engine a little on the lean side. Also, 15 minutes of rich running is not nearly enough break-in time for the engine. Part of your problem might be trying to run the engine too lean too soon without a proper break-in period.

Naturally, it is possible something may be out of alignment but this would show up in other ways as well. A crooked crankpin would elongate the big end of the rod. If the sleeve bore was not honed square with the sleeve o.d., the wrist pin would want to ride at the front or rear making a polish mark. If the wrist pin is not being forced to the front or back of the sleeve, then chances are pretty good that things are in alignment. An out of alignment sleeve would also cause the rod to be driven to the front or rear. If to the rear, there would be excessive scuffing of the backplate. So there would be other indications if

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alignment problems are the cause.

As far as returning the engine to K & B — you should have done this when the engine was new and under warranty. You can still send it in for service but can expect to be charged for any repair work — unless, of course, there is some sort of obvious factory goof up.

You did not say what size propeller you are using on the engine. Possibly you are loading the engine down with too much prop. You do not want to use anything larger than the equivalent to a 10/6.

What are the flying conditions like at your flying field? If you are flying from a dirt field without an air filter, you can expect very short engine longevity. I get engines back all the time that look like they were run in a child's sand box and the owner is really puzzled as to why the engine no longer has good compression, is hard to start, etc.

Dear Mr. Lee,

I have had an annoying problem with my OPS 3.5 Speed SLA car. I have it mounted in an R/C 300, and I am using the 9mm O slide valve carb w/filter. I am running pressure from a Serpent constant diameter type pipe. I have used the OPS R/C 300 and R/C car plugs, with the same problem. Fuel is K & B 100. The problem is that after an extended period of time at idle (20+ seconds), the engine loads up and won't accelerate properly. Several fast "blips" with the throttle solves the problem for the minute. Would an idle bar help?

Sincerely,

Michael Wettengal
Madison, Wisconsin

Mike, a 9mm (.355") carburetor is far too big for use on a 3.5 in an airplane. The R/C car guys use these big bore carbs but have the tanks mounted close to the engines, use gravity feed, etc. I am surprised you are not having more problems than just idle and acceleration. You should be experiencing fuel draw problems also. Maybe you are without realizing it. We only use 8mm (.315") carburetors on the Formula 500 K & B 6.5's for racing and this is about maximum for that engine without crankcase or pump pressure. Get a carburetor on your engine with an intake no larger than .250 and you will have much better results. Also, be sure to use an idle bar glow plug — it will definitely help.

Dear Mr. Lee,

Hi, it has been about 7 or 8 years since we have communicated. The last time was about a K & B .61 pumper. I sure had trouble then and you got me out of that one. Making a long story short on this K & B .61 P. --- it was a



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new engine at the time but it just would not get up and go in the Stearman Biplane I had it in (12 lbs.). You said to send it to you for a check out and repair. I also requested a port job and since then it has sure been a real good engine! I still have it and it has never been crashed. (Thanks again.)

Now I am having some trouble with an O.S. 1.20 twin. I hope it wasn't a factory defect. The right cylinder smokes all the time and the valves and/or pushrods and rocker arms seem to be wearing more than the left cylinder is. I have had to adjust the valves on the right side twice to get rid of noise. I am using at the time (cold weather) 12% Cool Power fuel. I broke the engine in on 5% Cool Power then went to 10% Cool Power. I use 12% Cool Power swinging a 14/10 S.M. prop. The engine is mounted in a Piper-Colt Sr. (10 lbs. complete, ready to take-off and fly). The engine seems pretty good on power but the right cylinder smokes just about all the time and sometimes misfires before warm-up and after flying 20 minutes or so. When it misfires, of course it loses power. It doesn't seem like it is a complete misfire on the right cylinder and the left cylinder is perfect. The engine was bench run for around 1 hour on 5% Cool Power very rich, then installed. It has at least twenty-five 30 minute

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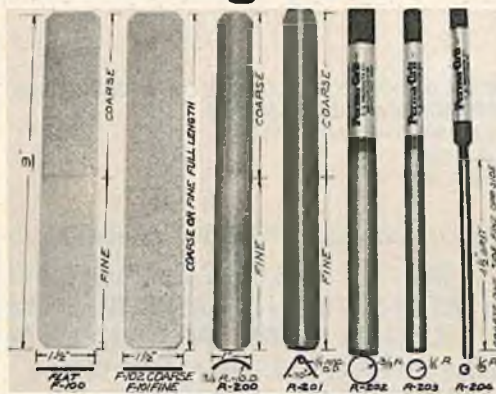
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Oh yes, when I take the valve covers off to check the valve adjustment, the right side has a grey, oily look and the left side has a clear, thick, oily look and there is always more oil in the left cover. When I say left and right side I mean looking at the engine from the cockpit of the airplane.

I noticed that the carb is very sensitive on adjustments, more so on the idle side. From just studying, adjusting, and listening to the engine while it is running, it seems like the carb and intake passages or tubes are not mixing the fuel in the same

quantity to both cylinders.

I hope I gave you enough info on this and hope you can help.

I bought this engine just about a year ago and it sure is a beauty to look at as well as sounding great on the ground and in the air. I haven't contacted the factory yet about this.

Thanking you very much,

William Close, Jr.

Deming, New Mexico

I really have not had that much experience with the O.S. Gemini twin. I got hold of one for examination about a year ago but that has been the extent of it. With so many new engines

coming on the market every month it would cost a small fortune to try to purchase every one so I have to depend on engines sent in for review by the manufacturers, and friends in the distributor end of the hobby, to loan me engines for examination.

Past experience with other twins would certainly indicate that the right cylinder is running too lean. It is normal with a twin cylinder glow engine to have one cylinder run a little richer/leaner than the other. Some manufacturers overcome this by using two carburetors (such as the Fox to page 159



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twin), modification to the porting, etc.

With a four stroke engine, many factors could cause one cylinder to run lean --- leaking valves, leaking head, leaking intake tubes, bad compression seal, etc., etc. Have you checked the engine for balanced compression? The compression on both cylinders should be equal. Remove the glow plug from the opposite cylinder and check each cylinder individually. If the right is low, then determine the cause --- valves, ring, head, or even the glow plug. If compression is okay, then there may be a leakage or restriction somewhere in the intake tube. Tighten the fittings and seal with Loctite. A loose intake tube can cause this problem. There are so many things that can be wrong and cause this problem that it is pretty hard to pinpoint the problem without actually having the engine for examination.

Dear Mr. Lee,

Your column is very interesting and I know you can help me with this problem.

For two years I have been using fuel mixed with castor oil as there is no problem with rust. But there is one problem --- the engine gets real dirty with varnish and it is very hard to clean. When the engine is very dirty, it doesn't run as well.

Now my question is that if I use "Cool Power" fuel (mixed with synthetic oil), do I have to load the engine with "after run" oil as I have to do with Apollo 7 fuel?

Your's very truly,
J.J. Demers
Verdun, PQ, Canada

It does not matter what brand of fuel is used, the engine should always be run out dry at full throttle following a flying session and loaded with one of the after run oils, 3-In-1, etc. All glow fuels contain nitromethane (except FAI) and methanol alcohol. Some brands of fuel have better anti-rust preventatives than others but you still do not want to leave any excess fuel residue in the engine or not add an

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In the February 1982 Engine Clinic I reviewed the then new and soon to be released Perry Micro-oscillating pump. I mentioned in the article that John Perry was conducting longevity tests on the pump by running it on a K & B 3.5 at 31,000 rpm. Not only was this a test for the pump but the K & B 3.5 as well. At the time of the writing John had just commenced the test and I always intended to check back and see how long the pump or K & B 3.5 lasted. Although we have had many conversations over the past year and a half, I always forget to ask about the

test. However, in a conversation with John a few weeks back, I did remember. The engine ran 5½ hours at 31,000 before the rod finally let go. Quite a few fellows have written in asking about this.

While on this topic, something else very strange has occurred. The Perry Micro-oscillating pump has been on the market for over a year and over 9,000 units sold. During this time I have received only one letter from a gentleman who had some mounting difficulties. Haven't any of you guys had any problems out there? How about some feedback, good or bad. This was the basis of John Perry's phone call to me a few weeks back. He, likewise, had not received any feedback on the operation of the pump. One or two fellows had called John in regards to adjustment problems but with over 9,000 pumps on the market it is logical to expect a larger response than has been received. Isn't anybody having any problems? Let's hear. □

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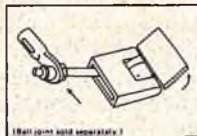
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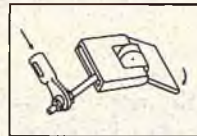
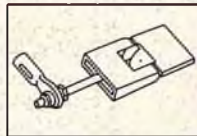
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PIT STOP

from page 100/95

run too long between pit stops, and ran out of fuel. At the finish it was Peter Bervoets in 1st with Dana 2nd. They missed some of Curtis' laps, and when they rechecked the sheets, Curtis was in 3rd spot. But only two cars moved up to the Main, with Vittoriano Orazi and Phil Greeno moving up from the other "B" Main.

The time was now ready for the "A" Main to determine who would be World Champion for 1983. The drivers and cars were announced to the large crowd on hand. Pictures were taken and everyone was ready. The cars were started in a LeMans type start. This means Ralph Burch had a 3' head start over the 2nd place car and so on down the grid. Give Ralph a start like that and he knows what to do with it. And when the horn sounded, he did it. Ralph was down the straight first, through the big bank and into the infield. Behind Ralph was a group of four cars and then a short way back, another group of five cars. Ralph was



1983 World's Champion David Lecat of France drove a great race with his PB car powered by Picco.



Ermes Tadiello from Italy drove his SG car powered by OPS to a fine 2nd place finish.



Rody Roem from Holland led the race in the early part with his Serpent car powered by OPS but problems dropped him to 3rd.

clearly the fastest car on the track and was steadily pulling away from the next group of four cars of Rody Roem, Giulio Gherzi, Peter Bervoets and David Lecat. These four cars were tightly bunched and were all running the same speed. Great emphasis was placed on the drivers during qualifying and the Mains, that no deliberate bumping would be allowed. So these four drivers were able to race door handle to door handle, go super fast, and still not run into each other. I think all the truly great racers I've seen, try very hard not to hit another car. Do you drive like that?

Ralph continued to pull away from the rest of the field. At the 5 minute mark, he had enough of a lead that when he took one of the infield corners a little too wide and got stuck in the hose, a marshall ran out and got his car and Ralph still had the lead. After the first pit stop, Ralph was leading with Roem and Gherzi close behind. Ralph couldn't pull away from them now, as his engine was starting to overheat. But he continued to lead to the 10 minute mark. His dad richened the engine up at the second pit stop to keep it running, and now all the other cars on the track started closing in on him. They tried to get the mixture so he could at least race, but it was impossible and he finally took the car off the track. What a difference four ounces of castor oil might have made.

Rody Roem now took the lead but he was now being hard pressed by Vittorio Orazi. It wasn't meant to be Rody's race either as he had engine problems which required lengthy pit stops. Orazi then took over the lead but his motor blew at 111 laps stopping his chances.

The race announcer then had Ermes Tadiello of Italy and David Lecat of France racing for the lead. The announcer was using a TV monitor screen to call the race. This same method was used in the qualifying races and was as much as 3 laps off in 28 laps, so all the racers knew it wasn't accurate, but the crowd loved it because the two cars were right next to each other on the track. Dana Smeltzer had moved into 4th place and was driving quite well in the early stages of the race. But about half way through the race, Dana tried to pass another car on the straightaway and he got on the slippery inside part and hit a timing block at 60 mph. I don't know why the car didn't self-destruct right then, but it kept running and Dana was able to hold down 4th place.

The hour long race ended with the announcer calling Tadiello in 1st, Lecat in 2nd, Roem in 3rd and Dana 4th. Tadiello was given a floral wreath and a bottle of champagne while everyone was busy taking photos. The end of a super World's Championship!



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Well, not quite, the French team knew the announcer was not official and according to their lap charts, Lecat had won, so they requested a confirmation from the official lap charts, but their request was denied by the track owner. The trophy presentations were to be done that night at the awards banquet. But the French team then petitioned Ted Longshaw, the President of International Federation of Model Auto Racing, to intercede on their behalf. Ted conferred with all the other IFMAR officials and representatives and it was decided to award all the trophies at the banquet, except for first and second places, which would be awarded the following morning. When this was announced at

the banquet all the racers present applauded. They obviously felt it was the only fair thing to do.

After the banquet, Ted Longshaw, Bernard Poupaert, who is the French R/C car president, the Italian team captain, the French team captain, and Micheline Lesieur the Race Director, went to Mr. Rossi the track owner to go over the lap charts. They in fact found out that Tadiello had received one too many laps. At this point, something happened that caused Ted Longshaw to fear for his life — actually — and everyone was told to leave by Mr. Rossi. At this point, while everyone was being escorted to the door, Ted grabbed all the lap charts and put them in his coat.

to page 172

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PIT STOP

from page 161/95

The IFMAR meeting was scheduled at the track the next morning. While Mike Reedy and I were leaving our hotel to go to the meeting, we saw Ted Longshaw who told us everything that happened the previous night. He also told us he felt he should resign as IFMAR President because he always thought of R/C car racing as an exciting, enjoyable hobby, but when his life was threatened it was not



Top finishing American driver Dana Smeltzer really had to work for it. He had to move up out of the 20 minute long "D" Main, then the 20 minute "C" Main then the 30 minute "B" Main and then drive the one hour Main event. This he did very well finishing 4th with his Associated RC500 car powered by K & B-McCoy.

worth the expense. Besides, he was told never to come back to the track, which is where the IFMAR meeting was. Mike and I went to the meeting. There were about 60 racers at the meeting, but no Ted, and then about half way through the meeting Mr. Rossi came in and announced he was

ready to present the 1st and 2nd place trophies. He presented the 1st place trophy to Tadiello and the 2nd place trophy to Lecat.

The following week at the international race in Wiesbaden, Germany, Ted Longshaw distributed an official IFMAR letter declaring David Lecat of France as the 1983 World's Champion. EFRA has since voted 2 to 1 in agreement with the IFMAR decision.

I must apologize for going into such a great deal of explanation on this, but it is quite important. R/C Modeler Magazine is read by people from all over the world. Italian magazines have been published already with Tadiello on the cover as World's Champion. An English magazine has Tadiello on the cover, but the story says Lecat won. Another Japanese magazine has beautiful colored pictures of the race but a question mark for the winner.

I felt our readers needed to know the events as they actually happened. It's such a great shame that a track owner could build such an incredibly fantastic track, stage one of the best R/C car races ever and then cause these kinds of problems. But I prefer to remember the many good things about this race. □

SOARING WORLD CHAMPS

from page 94/88

The U.S. team arrived on site a week early and practiced recovery from all conceivable mishaps; became accustomed to the field and English conditions. By the morning of the start of the contest the team was confident and thought only the West Germans and Australians were to be feared.

So, with all this horsepower — why did the U.S. team place 9th, achieving only 7th individually? This is not to

to page 176

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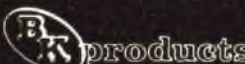
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imply that 7th is not significant, but the capability was for much more. I believe the problem was a lack of serious preparation. A month before departure none of the U.S. fliers had a flyable sailplane. Mark Smith only had a couple of weeks testing on his new design. Don Edberg hadn't much more, but on a design he'd flown before. Alex Bower's Tai Tai was an eleventh hour completion under Team Manager pressure. I don't care how competent the pilot (and these are the best), each sailplane has a personality of its own and requires time to sort out the flight characteristics.

Mark Smith never misses his landings and always makes his time in his specialty — Duration. In the first round he fell short at 5:27 but got a 100 landing. Second round he maxed but landed short in the wind for 30 points. Third round he only made 5 minutes, with an 85 landing. He got into it on the fourth round for a 5:56 and 95. On the fifth round he only made 5:15 and 90. In the last round he was in form at 6:00 and 90. Not too shabby? Maybe for a club contest, but this is World Class competition. Mark had the bad luck to get bad air, right? Wrong! Duration was launched by flight group with 10 simultaneous flights — all in the same air. In Mark's Round 1, flight group, both Quaebeck of Germany and Sweers of the Netherlands maxed. In Round 3, there were 4 maxes. In Round 5, there were 5 maxes.

Alex Bower's specialty is Speed. In the six rounds he was 14th, 16th, 28th, 5th, 7th and 3rd, respectively. Alex's lack of any sort of speed brakes was a source of trouble. On relaunch, one full minute was required to get Tai Tai on the ground. Bowers' landings were far from World Class. He had a 95, 90 and 4 zeros; one of which was earned when he hit himself with his sailplane.

Don Edberg's mechanical problems were not all in keeping with his past performance. Continual tow hook difficulties should not have happened. On one flight the towline broke near the parachute when the parachute ring jammed in the tow hook and did not release. Don completed 8 laps in Distance before the officials called him down for not being off tow. The Team Manager should have caught this one, but at least he protested an official release signal given in error and Don was given another flight.

SOARING WORLD CHAMPS

from page 176/88

Don's wing break in Round 2 must be unusual for Don and may reflect hasty construction.

The Team Manager made a couple of glitches like losing track of the laps on one Distance run, etc., but, in general seemed a real asset both on the field and in making preparations prior to departure.

So, what did I think of the whole thing? First — six days of F3B, or any type of flying, is too much. Everyone was wrung out, and my lower lip was badly sunburned. F3B is a dragged out event and not a good spectator sport. The constant setting up and taking down of winches is a real time consumer. Winches, in general, present a problem. I found little support for permitting continuation of the horsepower race. Several countries are strongly in favor of a return to hand towing to provide a more equal launch and to speed things up.

There will be a press to modify rules. Dan Pruss circulated a questionnaire to all Team Managers and a meeting was held to discuss views on rule changes. Distance will come in for a lot of discussion. The Germans favor man-on-man in this event. There is some feeling that Duration times should be increased.

Well, it finally came to a merciful end at 4:30 on Saturday with the closing ceremonies. A quite magnificent Prize Giving Banquet was held in the Gimcrack Rooms of the York Racecourse. Over 250 people were in attendance and the affair was presided over by the Lord Mayor of York. As a bit of an aside, at the banquet, Richard Douglass sent a note along the head table to the Organizing Chairman; "How can we save money to make up the budget deficit?" As the note passed the Lord Mayor he glanced at it and scribbled; "Don't invite the Lord Mayor, however, I'm

already here." The banquet was typical of the way the Organizers handled all phases — very professional service and genuine crystal stemware. It will be a hard act to beat.

There was an observer present from Czechoslovakia so perhaps we will see some of the Eastern countries in the future.

Sunday morning we wandered through the English back roads and visited Warwick Castle, among other things. A funny thing happened in Burford. We took a room at an inn built in 1430 (think about that!). We asked for a room with a bath, which is what we got; however, the Biffy was down the hall. Which only bears out my philosophy — ya gotta know what questions to ask.

We spent three days in London; took a boat trip up the Thames to Hampton Court. The mighty Thames was so low in one spot, our boat, with less than 3 ft. draft, scraped bottom for a mile or so. My wife and I also scraped bottom when we arrived at Heathrow Airport for return, three hours early, only to find a four hour delay in our Pan Am flight — Howzat! □

SCALE VIEWS

from page 73/67

original aircraft. Nicely detailed and a good flier. Richard Calderigi had the only Macchi C-202 at the meet, taking third in Sportsman. A nicely done model of the F-16 from the Byron kit painted in USAF "Thunderbird" colors put John Graham in fifth place. The F-16 performed well with the new Rossi .81 turning the fan.

FAI Scale, under the new rules, replaced the old AMA Precision Scale for the first time at the 1983 National Championships. Nine models were entered which is already some improvement over the number in Precision at former Nats. About half of the models entered had flown in past

Precision Scale events while the others had flown in Sportscale events. Top scores were racked up by the former Precision Scale models with Cliff Tacie's "Spezio" ending up in first place. An encouraging beginning for an untried event.

Westover AFB turned out to be the best site for a National Championship meet since the 77 Nats at March AFB. Smooth runways, grass for parking and pits, facilities for housing close in, air conditioned facilities for processing and AMA activities, and an Air Force Reserve host that even combined the AMA meet with an Open House display and airshow over the weekend.

The Air Force airshow provided a needed lunch break for the scale flight judges and an interesting diversion for the contestants and the large crowd of spectators. The show included drops of paratroppers and cargo from C-130 tactical airlift planes and some low and high speed passes with C-130 and A-10 aircraft. The C-130s at Westover are flown by USAF Reserve pilots and I got the impression that the "Weekend Warriors" included a few frustrated fighter pilots. A fun type show on both Saturday and Sunday.

In spite of the large number of contestants, organization and conduct of the scale events was the best ever. Bob Underwood put on an act that is going to be hard to follow. Bob's daughters, Ann and Cathy, performed all of the static and flight score computations with a speed and accuracy that would put a computer to shame. I bet they are still punching those calculator keys in their sleep. Two widely spaced flight lines were set up on the long runway with two sets of judges at each. This was the only way to accommodate the required number of scale flights but it did make it difficult to cover all the action. Bob must have walked fifty miles in the two days but I was a bit less energetic. In spite of shooting about a hundred photos, I discovered when I got home that I had not photographed a single

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one of the top placers except for Cliff Tacie's FAI model. I guess there were just too many interesting models that I had not seen before so we are going to share some of these with you in this article.

The local Pioneers R/C Club had their members out ready to help with any problem that came up during the contest, and help they did. I had traveled to the Nats with scale contestant Mario Yederlinic but, having different frequencies, we wound up on flight lines at opposite ends of the runway. No chance to help each other. Dave Hollenbeck, with his son Gregg, came to my rescue helping with engine start, calling, retrieving drop tanks, and even assisting in the repair of my recalcitrant retract system. Dave is VP of the Pioneers Club, a scale enthusiast and an all around nice guy. Meeting people like the members of the Pioneers R/C Club is one of the real fringe benefits of attendance at the National Championships. May they all have a mild winter and an early spring.

I cannot end this column without mention of the modeler who put in more flights than any other contestant. Springfield, Massachusetts, is the original home of the Gee Bee racers and I am sure that Henry Haffke has built more models of these 1930s aircraft than anyone else. Henry was the only contestant to enter three different scale events and he had a different model of a Gee Bee in each. The models flew in FAI, Sportscale Expert, and in Giant Scale. All of the models flew well although the short, tailskid equipped birds are not easy to handle on a paved runway. Again, it was variety like this that will make lasting memories for the 1983 National Scale Championships at Westover AFB, Massachusetts. □

IMAA FUN FLY

from page 64

unpainted. If you have ever seen a fiberglass model of a Thunderbolt flying --- without any paint --- you'll have some idea of what this looked like. As it taxied out, you could see the fuel sloshing around in the tank inside the fuselage!

There were a number of manufacturers present at Ida Grove and there was one item I found impressive. Don Harris showed me an engine I had not seen previously and it looks good. It's the Zenoh 2.3 cubic inch and is definitely an item that you should look for. The best news is that the engine will retail for around \$135.00.

to page 182

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IMAA FUN FLY

from page 179/64

The four day event was favored with bright clear skies with the exception of a part of Saturday and much of the rain fell during the night. Sunday, the last day of the Festival, was bright and hot again.

I was not aware of any problems of any consequence during the four days and Byron and his staff are to be complimented on a big job well-done. The IMAA volunteers contributed significantly to the success of the affair and I saw several of them manning the IMAA booth almost full time. The food at the picnic, banquet and at the site was all excellent and reasonably priced. The people of Ida Grove made us all feel welcome and a gaggle of hot air balloons made a colorful and interesting contribution to the event, along with some sky divers.

It's always a particular pleasure to have a visit with people like Dario Brisighella, Hazel and Maxey Hester, Ray Colelli, Walt Mocha and the Byron and IMAA crews. Jerry Smith, another Contributing Editor to RCM, and the two guys who do most of the "bull work" of putting RCM together, Dick Tichenor and Dick Kidd, were also able to attend at Ida Grove and it's always a pleasure to see all three of them.

While there is every likelihood that IMAA will choose another venue next year, Byron intends to continue sponsoring the show in the future. I would guess it will include all of aviation from Models to Warbirds in the future and I suspect it will become one of the premier aviation events in Iowa in years to come. One can only wish continued success to the people of Byron Originals who now have had the experience of doing the show twice. If they do continue in years to come, I'll be one who will want to go back.

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RADIO SPECTRUM

from page 62/60

crystals to work with that device. By the way, if anyone out there is working on their own receiver design, take a look at the Siemens 1469 which combines both the SO41 and SO42 in one package. Mich Wilshere wrote us from England with that information, along with some comments that he feels the German narrowband FM

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technology is the best. Perhaps the Kraft dual conversion receiver will change his mind. I haven't seen anything like it from the rest of the world. For those interested in specs the Kraft KPR-8FD has a usable sensitivity of 1.5 microvolts (μV) a 6 db bandwidth of ± 3.5 KHz and a 50 db bandwidth of ± 9 KHz. The image rejection is greater than 60 db and spurious and harmonic rejection 55 db.

My testing has been limited to putting it into a plane and flying with whatever happened to be at the field. So far no problems with any kind of RF interference. Bob Aberle from Flying Models and George Meyer from Model Aviation ran extensive flight tests with channel spacing 30, 20 and 10 KHz and reported excellent results. The only test I'd like to see run is the simulation of contest conditions with transmitters 200 to 400 feet apart and the receiver 20 feet from the jammer. If it can handle that condition with 20 KHz spacing, and I suspect it will, we've got it made. Now, if it only had PCM. Mich mentioned that Multiplex, another German system, has PCM as well as being preprogrammable. That makes at least three German systems that have PCM, and I know Futaba and JR also have it. Looks like someone needs to combine PCM with a dual conversion receiver.

New Frequencies at the Nats

The word from the Nats was that there wasn't any interference reported on the new R/C channels. Officials estimated that about 250 contestants flew on the new channels so it sounds like a pretty good test. I don't know if anyone took any precautions on setting up the flight lines to avoid the image problems but I suspect not. If you are a contest director and are setting up flight lines, always put the channels that are potential image problems on the same line so they can't fly simultaneously. Once again, this is only a problem if the lines are separated by a few hundred feet. I understand the sailplane guys had 15 planes in the air all the time so it sounds like the guys are making use of the new frequencies already.

Bells and Whistles

Dick Kidd received a letter from Bill Fitzurka of Manchester, Missouri along with a brochure and manual for the German Multiplex Profi 200C system. This model does not have PCM but does have all the so-called

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RADIO SPECTRUM

from page 184/60

programmable features. Bill's reaction to the material was very positive. He indicated he would be willing to pay \$1100 for one if he could get it in the U.S. and that he was considering having his brother buy one for him in West Germany. Well, I think Bill is like a lot of people who have to depend on sales information. The message that I would like to get across is that the things that really make one system better than another are seldom discussed in ads, such as

the quality of the gimbals, the pots, gear trains, motors, etc. As for all the switches and adjustments, they are mostly sales gimmicks. I just put a JR Unlimited in a new airplane and after disabling most of the "features" I started asking other guys what they used. Nobody used any of the push buttons or mixers and generally the dual rate aileron was the only thing everyone used. I'm not knocking the JR; in fact, I think it might be better without all the "features." I'd like to hear from the rest of you. Tell us what you use on your fancy radios.

Understanding the Ads

I'm sure the people who write ads

know what they are doing and what they are talking about, but maybe they would do better if they weren't so smart. After we're in the hobby awhile we pick up the jargon, but pity the newcomer. Clarence Lee got a letter from Phillip Simmons of Iuka, Illinois, who is just getting started. He had two questions that Clarence thought I should answer. (Editor's Note: Jim Oddino was not aware of the Whistles and Bells article by Tim Renaud that was to appear in our October 1983 issue when he wrote the following.)

The first question asked what reversing and dual rate servos are.

to page 188

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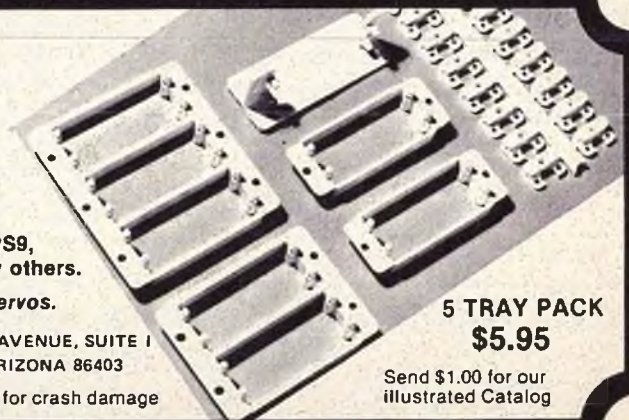
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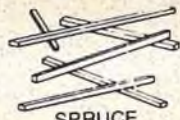
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RADIO SPECTRUM

from page 186/60

Well, how do you answer that? First of all, the feature we call servo reversing is something that is built into the transmitter. With the flip of a switch you can change the direction your servo moves for a given direction of control stick movement. Say you install your servos in your plane and you hit right rudder and your rudder moves left. You hit the reversing switch in the transmitter and your problem is fixed. As you can see it is a convenience feature which you can do without, if you do a little planning when installing equipment.

The dual rate is a feature that is very worthwhile. Once again, it is not a servo function but is built into the transmitter. A switch allows you to select two different amounts of servo throw for a given control stick position. Let's say hard over right rudder drove the servo 50 degrees from neutral when I was in high rate. I could flip the dual rate switch and get a lesser amount which is adjustable for certain maneuvers. Note that it doesn't change the servo rate, but by having less servo travel, the airplane will turn at a slower rate and hence the name dual rate.

Phillip's second question asked about servos not being fuelproof. I haven't seen anyone offering special fuelproof servos. Generally, all the servos are fuelproof as far as the materials are concerned. However, you wouldn't want fuel to get on or in your servos because the oil film would collect contamination. If you think you might put your servos in an environment where you will get fuel on them, it might be wise to get waterproof servos which will keep everything out.

If anyone else out there needs any terms defined, let us know. Also, if there is any other subjects you'd like discussed, tell us what they are. 'Til next time, stay tuned. □

FLYING LOWE

from page 50

competition and then crashed my "Phantasy" at Rough River the day before competition began! Certainly, the modeling gods have not been smiling on me!

The most interesting thing, however, about the Masters was the great effort expended by many to meet the sound barrier — all discussions concerned what everyone had tried. Also, Radio Shack sound meters were

everywhere — most of which seemed to be reading high when checked by Ed Izzo's calibrator.

A lot of contestants were running the Giezendanner and Weller three bladed props and meeting the requirement (105 db at 1 meter). Two bladed prop users were running very high pitch (≈ 10 in. pitch) to keep rpms down. There was evidence of some work on the engine intake. A number used air filters; Al Dupler had the largest, a go-cart filter which he claimed reduced sound 1 db. Dave Brown reported he had seen as much as a 5 db savings with a change in engine bearings!

Exhaust noise seemed to be no problem, with a wide variety of standard muffled tuned pipes being used. The ship I ended up flying used an E-D external pipe, no intake muffling, an 8" pitch Giezendanner three bladed prop on an O.S. .61 — and had no trouble with noise — 103 db. Noise was checked before each flight and required only a few seconds. The jury finally ruled that one must meet the noise requirement on at least one of the three counting flights to be eligible for the team selection. The eventual winners, Dave Brown, first; Steve Helms, second, and Tony Frackowiack, third, had no trouble in that respect. It appeared to me that few suffered much from a loss of power — the top fliers moved about as fast as ever. My impression also was that the engine noise in the air wasn't much different than normal. My own measurements at home on fly-bys of "noisy" and "legal" models showed little measured sound difference, with all in the 70-80 db range. Noise is a very subjective thing — what sounds bad to some is very acceptable to others — sound frequency certainly plays a part; also unusual sounds bug some people. Meeting a finite sound requirement at a contest really has little meaning since we're dealing with an unusual, short term event, usually conducted sufficiently remote to not arouse the local populace.

What really counts is what this all means to the local average club flying field. It would also make sense to have a consistent enforcement of noise requirements across the board in all categories of noise makers. All that we can do by enforcement in competition is to help establish a trend and hope some of the technology spills over and is used in sport flying at the local level. One of the noisiest models I measured was a 114 db Aeromaster using a very poor "muffler" at our local RCACF flying field in Orlando! Competition enforcement is meaningless unless it helps with the local situation. It also seems to me that manufacturers must do their bit by ceasing to sell some of



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the junk now on the market called mufflers. We have to work the problem from both ends. Clubs need to put more teeth in their club rules by prescribing and testing to some finite noise requirement --- and manufacturers should put more effort into selling quality products. Of

course, if clubs establish and enforce requirements, then manufacturers must follow suit or lose business. I know that a lot of modelers react to this noise business with contempt — "we don't have a problem in this country — let Europe solve their own

to page 192



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FLYING LOWE
from page 189/50

problem and leave us alone" — or words to that effect. Believe me, many clubs in this country do have a problem and many flying fields have been lost or flying restrictions have been imposed to pacify neighbors! If we had an across the board requirement, all modelers would benefit in the long run from the technology development, whether they think they need it now or not! 'Nuff said.

Following the Masters event in Kentucky, my wife Clara and I journeyed to Ohio and spent an enjoyable two weeks with my son and visiting friends and relatives. It also gave me time to try to get my act together, sort out some problems with my remaining aircraft and prepare for the Canadian Nats. Chuck and Pat Shude and the Lowes decided to attend the Canadian Nats since it is always an enjoyable low key event and is not too far from Dayton, Ohio. It also was a U.S. Nats substitute for me since I couldn't make it due to the business trip to Israel. The Canadian Nats is conducted on the basis of help and participation by the competitors. The Pattern event always uses contestant judging as well as support by contestants in other ways. All other events are similarly conducted. Pattern ran three days, allowing six flights for each contestant. During that time each contestant was required to judge a half day or two rounds — not bad at all. The judging was of high quality as is usual where contestant judging is used. This is the norm in the U.S. Midwest area and has been used for years since we first tried it in Lima, Ohio, many years ago! Your's truly did a little better at the Canadian Nats finishing three points down to many time Canadian National Champion Ivan Kristenson. But then, both he and I were aced out by upcoming Greg Marsden of Hamilton, Ontario. The Canadian team for the Pensacola World Championships is Ivan, Greg and Jacques Gagnon (of Quebec). I might also proudly add that both Greg and Jacques are flying Phoenixes — in fact, my design abounded in Canada at the Nats. Incidentally, the entire Canadian teams use Clive Weller's three bladed prop and meet the noise requirement. Clive and family were at the Nats and it was a great pleasure renewing acquaintances with them and our many other friends in Canada.

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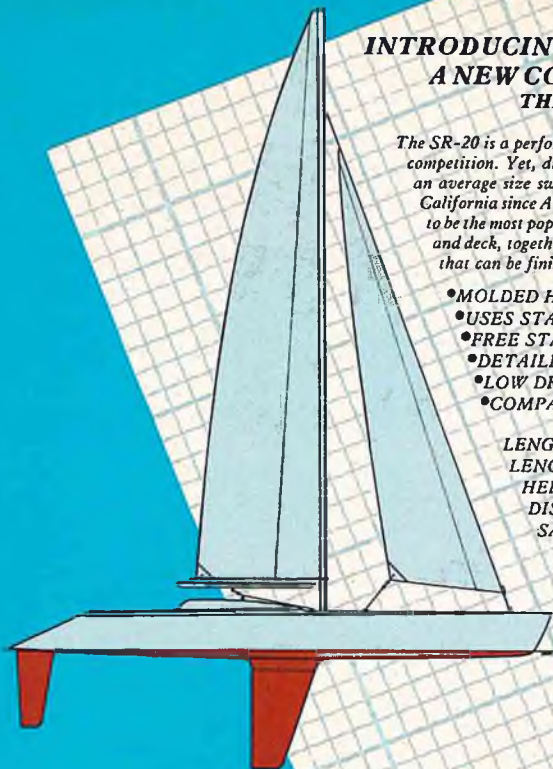
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the Canadian Nats afforded an opportunity to further discuss model requirements for the "turnaround" pattern. Many expressed bewilderment over what was needed to be competitive. My own opinion has been for some time that the secret will be a reduced wing loading to allow slower, tighter maneuvers and to reduce power requirements. Several events have already been held in the U.S., one in Orlando, where standard pattern ships were used. Personally, I feel that you can take a standard pattern ship using the same engine, pipe and prop, build it at least one pound lighter, i.e., 7-7½ lbs. versus 8-8½ lbs. and do a good job. One very good way to remove weight would be to eliminate the retractable landing gear and install a fixed two wheel gear. Minimum use of paint, substitution of iron-on coverings and careful selection of wood will all help.

I have a Phoenix 8 with retracts that weighs 7 pounds, it flies Turnaround very well. Ron Chidgey is trying another approach; a 1000 sq. in. Laser type design with the geared O.S. .60 engine. He calls it "Tar-Baby"; a play on words "Turnaround Baby." Hopefully more modelers will try their luck with new designs. I'm planning to build a new "Phantasy" of reduced weight for the event.

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..... that the 1/4 firewall be tapped out, drilled to accept the motor mount and fuel lines, and then reinstalled with slow drying epoxy and trailing edge stock. The instructions provide step by step guidance on the installation and alignment of the vertical and horizontal tabs, in relation to the engine and wing. In general, the fuselage goes together with a bit of 15-minute epoxy, some aliphatic resin, and a few drops of Zap. The canopy was not installed as instructed since the aircraft was to be painted, therefore, the canopy was installed later.

Cover/Finish:

Since we planned to use the Super Lucky Fly II in pattern contests and general sport flying, it was decided to paint the aircraft instead of MonoKoting. The wing received three coats of sanding resin as opposed to finishing resin, with sanding of 120, 200, and 400 grit paper in-between coats. The fuselage received the same treatment. After the resin was dry, a tack rag was used to wipe the parts down. A total of four light coats of acrylic enamel were applied as the base coat. Trim consisted of two coats of red and blue acrylic enamel star bursts. The bottom of the wing received a red checkerboard pattern to help differentiate from the top of the wing. If the Lucky Fly II were MonoKoted, the weight would probably drop to the 6½ to 7 pound range.

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Engine:

The Super Lucky Fly II was destined for the installation of a Webra .61 Speed as a power plant from the very start. The Lucky Fly had more than enough room for the installation. Since the firewall and wing dowel bulkhead were pre-aligned, and the nose gear bracket was mounted in conjunction with the motor mount, a 10 ounce tank was installed. A bit more flight time could have been gained by the installation of a 12 ounce tank.

Radio Installation:

A Futaba 7FGK was installed with the standard four functions. Retracts will fit nicely in the wings, if desired. The wing was thick enough so that the

aileron servo was buried in the wing with only the servo arm protruding through the skin. A tray was used on rails which was, in turn, attached via silicone to reduce vibrations. A 550 ma flight pack was installed with enough room remaining for a 1200 ma pack or a redundant battery system. Pushrods consisted of steel rods inside of blue

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SUPER LUCKY FLY II

from page 195/42

nyrod with supports every 4". The fuselage has an abundance of room for radio installation and the rails are provided in sufficient length to permit adjustment of the final C.G. by servo tray location adjustment. It should be noted that the plans do not identify the C.G. A reference in the instructions located the C.G. at a point 1 1/2" to 1 3/4" back from the leading edge of the wing at the tip. A dynamic balance using a microwave scale and a ruler located the C.G. at a point 1 7/8" to 2" back from the leading edge at the tip. The dynamic balance point proved to display a very crisp three turn spin and sharp snap roll characteristics.

Flying:

The Super Lucky Fly II performed its maiden flight at 7:15 one evening in a very brisk breeze. Controls were a bit more than indicated in the instructions with an anticipation of kicking down to dual rate on the transmitter. Liftoff was smooth and level. A slight amount of left rudder trim was required to keep it from crabbing. After a few minutes of trimming (and calming of the nerves), full power was applied and the novice/sportsman flight pattern was attempted. Under full power the controls were much too sensitive and dual rate was applied. Even in half rate under full power and with full elevator, a loop was only 30 to 40 feet in diameter. The initial landing was quite smooth considering the headwind. The Lucky Fly has a very gradual descent rate that enables the pilot to feather his landing. After a 50% reduction in elevator and aileron control throws, the 2nd, 3rd, and 4th flights were quite respectable. The Webra .61 provided an immense amount of power and pulls the Lucky Fly through rolls and loops without any sag. A zero/zero wing/engine alignment requires very little down elevator in inverted flight.

Conclusion:

The Super Lucky Fly II appears to be well-designed and constructed. A rewrite of the instructions, omitting non-applicable instructions, might be nice. The kit is designed for the average flier who wants a performance oriented sport ship or a competitive beginning pattern aircraft. The Super Lucky Fly II is more than capable of placing in the novice or sportsman pattern events held by most clubs. The cost of the kit is well in line with the performance and quality of the completed aircraft. The kit is recommended as a graduating step from a shoulder wing

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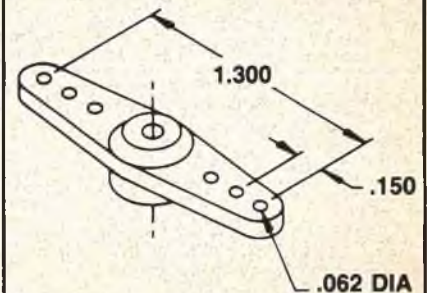
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aircraft to a low wing pattern ship. The ease of construction enables the pilot to get into the air a week after he receives the kit. The Johnny Casburn Super Lucky Fly II is a quality kit that most fliers should enjoy owning, building, and flying. □

A3J-1

from page 34/24

The damage occurs where the wire is routed through a bulkhead or comes in contact with some part of the structure that can cause chaffing. Be sure to secure the wires at frequent intervals to fuselage wall, etc., and protect the wires with grommets where they pass through the bulkheads.

Note that no rudder function is used since the model turns adequately on aileron alone. At the price of additional weight the rudder could be made operable. It pivots at the same point as the stabilators, just aft of F12, and it is all moving like the stabilators.

Aileron deflection should be 1" up and down (total 2" movement) at the trailing edge. This provides a roll rate of approximately 360 degrees per second.

As I mentioned earlier, the full sized A3J did not use ailerons. It used a complex series of spoilers and deflectors located at approximately 70% of the wing chord. When activated, they killed lift on one wing and increased it on the opposite wing without causing any adverse yaw. It seems impossible to duplicate this roll control system at the 1 1/4" = 1' scale of this model without a tremendous penalty in weight and complexity. Therefore, I elected to use the flap surfaces as simple ailerons. You may want to mix the ailerons with a flap function and thereby achieve flaperons. However, like the rudder, this is not really necessary since the model lands slowly without flaps.

Flying:

Balance the model carefully. You should be able to achieve the Center of Gravity position shown on the plans with the battery pack located just forward of F5 attached to the top of the nose wheel well. Do not fly with the Center of Gravity aft of the location shown on the plans. The model should weigh less than 18 lbs. without fuel. My first model weighed less than 17 lbs., but it had minimal finish and detail. The current model, my third, is flying at almost 19 lbs. I have flown two of my Vigilantes off of grass, but it takes an excessive amount of runway. I recommend flying off hard surface runways only.

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The K & B 7.5's run well on anything from 10% to 25% nitro fuel. I have found OPS plugs to be the most durable; however, they should be changed at least every four flights to insure reliable engine operation.

The engines are started with the wing removed. An electric starter will fit easily in the duct with the hatch removed. Tack both engines to be sure you are receiving at least 22,000 rpm. Using a crude spring scale, I've measured the combined thrust at that rpm as 11.5 lbs.


When satisfied with the engine operation, place the wing in position being sure to plug in the ailerons.

The take-off run on hard surface with no wind is about 150 feet, on grass it is at least 200 feet. Allow the model to accelerate until a slight amount of back pressure pulls the nose wheel off the ground. The model will continue to accelerate in this rotated position for a few feet leaving the runway cleanly once it has reached flying speed. It will climb positively at a 15 degree angle. At altitude you will notice that the model responds crisply in roll, but that it is extremely stable in pitch. This is probably due to the long fuselage. Characteristically, the Vigilante will remain in the altitude it is pointed until a new pitch command is given. Maneuvers such as the Figure 8, the procedure turn, and the fly-by can be done easily with no change in altitude. Rolls are very axial. The top speed is probably 90-100 mph; however, this seems to vary noticeably with temperature and humidity.


Landings are truly effortless. A long, final approach with a constant angle of attack is the most scale-like method. Rate of sink is controlled with engine power. Remember that ducted fans are not as responsive as a propeller aircraft to sudden bursts of power, especially at low rpm. Graceful nose high touchdowns are easily accomplished.

Loss of an engine is only a problem at low altitude and low airspeed. The model will maintain level flight and even climb slowly on one engine; however, at low airspeeds you will find it difficult to accelerate, and a landing approach should be established immediately.

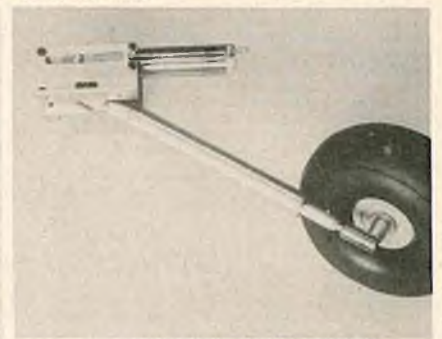
After building three balsa Vigilantes, I hope to mold a glass fuselage. I suspect that glass will give me a lighter airframe (I would be very happy with a 16 lb. Vigilante). □



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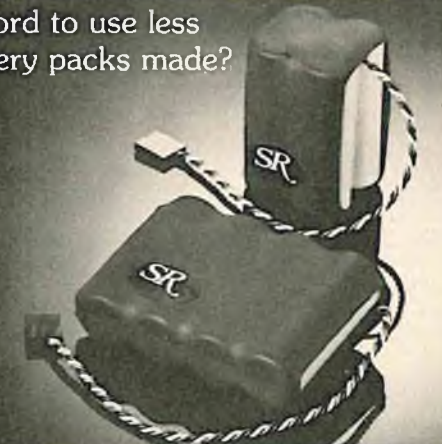
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