MODEL BUILDER

WORLD'S MOST COMPLETE MODEL PUBLICATION

FEBRUARY 1985
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ICD 08545
volume 15, number 157

FIVE PRODUCT REVIEWS!

FEATURES:

- SEGUIN FAN FLY
- KRC ELECTRIC FLY
- INDOOR R/C AT NATS

UCTION:

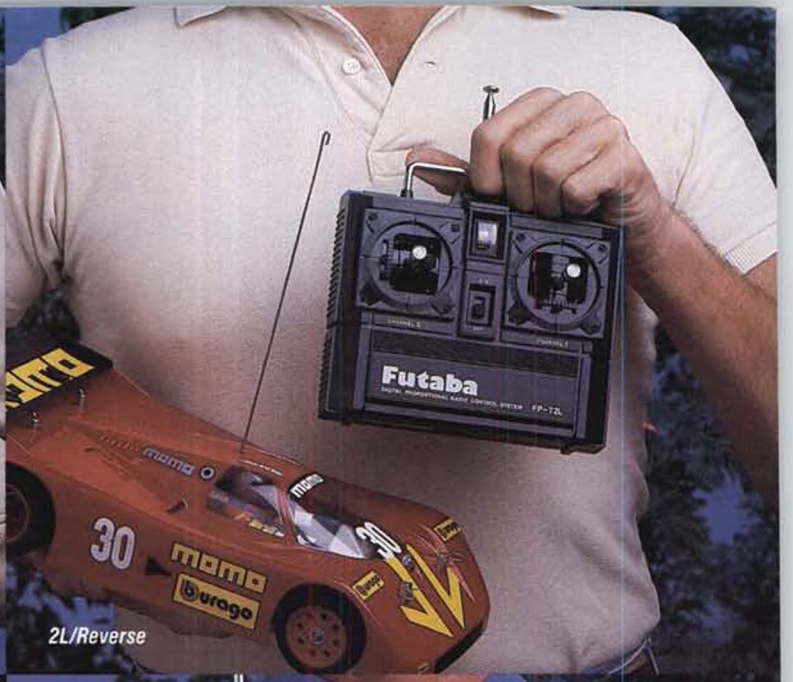
- RCOUPE
- IPLEX
- ERLIGHT
- T TAILWIND

WORLD WIDE MODEL HIPERLIGHT POSTAL CONTEST!

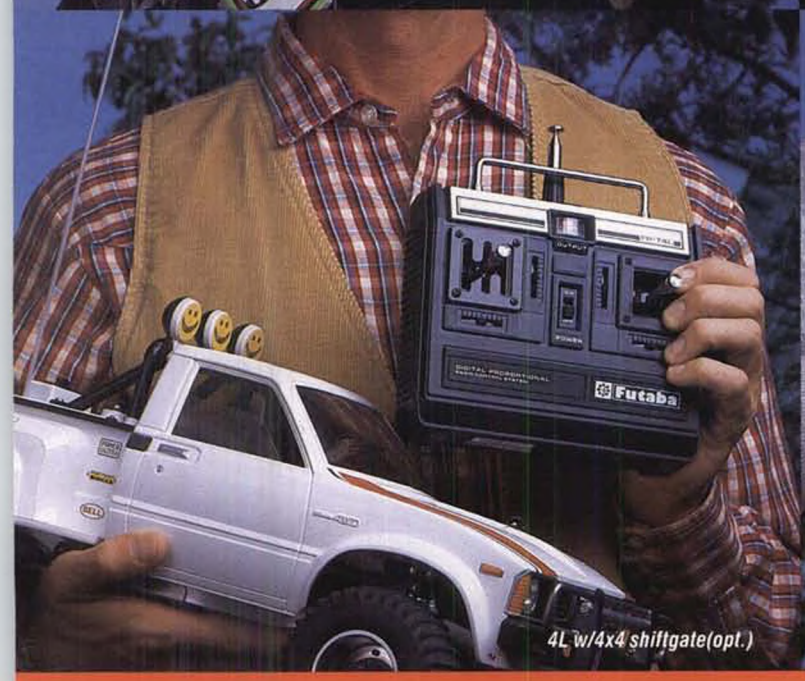
SEE PAGE 50

0 74820 08545 02

2NL/Attack



2L/Reverse



4L w/4x4 shiftgate(opt.)

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WORLD FLIGHT PILOTS
JEANA YEAGER / DICK RUTAN
PHOTO BY DOUG SHANE

Voyager
PHOTO BY PAT STORCH

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MODEL BUILDER

FEBRUARY

1985

volume 15, number 157

621 West Nineteenth St., Box 10335, Costa Mesa, CA 92627-0132 Phone: (714) 645-8830

CONTENTS

FEATURES

CONSTRUCTION

Cover: This cute little ultralight has all the obvious design features of its famous big brother, and could very well become even *more* famous. It's the Sorrell Hiperlight, voted the "Outstanding New Ultralight Design" at the 1983 Oshkosh Fly-In. In fact, it may be just the thing for modelers who want to build something larger than quarter-scale! And you won't need to buy an R/C system! Send inquiries to Sorrell Aircraft Co., Ltd., 16525 Tilley Rd. South, Tenino, WA 98589. Please mention that you saw it in Model Builder.

The model in the insert was built by Dick Howard, from Clive Wienker's plans. You'll find more info about the model, and the World Wide Model Hiperlight Postal Contest, on pages 50 and 51. Hiperlight photo by John Sorrell. Modelphoto by Dick Howard.

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GOLDEN GATE HOBBIES

R/C

2ND PLACE, AMA TURNAROUND, RENO NATS: IVAN KRISTENSEN AND THE ATLANTA 60. POWER? WELL, LET'S JUST SAY IT WAS *AWESOME . . .*

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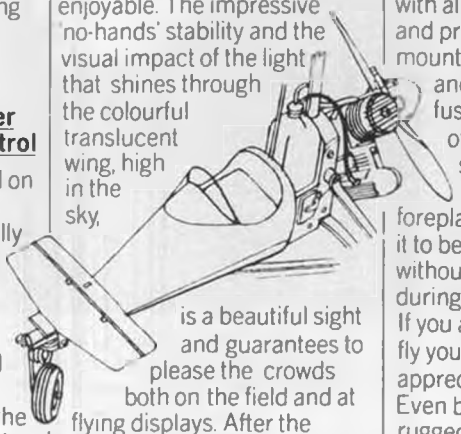
IT'S A PARACHUTE, IT'S AN ULTRALIGHT, IT'S A PARAPLANE

The remarkable Windbag owes its exceptional flying and handling characteristics to the patented Flexifoil 'Softwing'. This aerofoil shaped ripstop nylon envelope that inflates with air through the leading edge as it moves forward is called a softwing since the only rigid support is a tapered glassfibre spar in the leading edge of the wing. Beautifully made, the big 12 sq ft wing does not require any finishing and is virtually unbreakable and yet packs down pocket size.

There could be no better introduction to radio control

With the wing mounted on top of an alloy kingpost, the Windbag has an exceptionally low centre of gravity and is totally self stabilizing. From virtually any manoeuvre, as soon as you release the controls, it will revert to level flight. When in 'stalled' condition, with full 'up' and the engine shut down or idling, the aircraft will sink almost vertically like on a parachute. This manoeuvre can be used to get out of any 'panic' situation. But more likely, you will soon be flying around and enjoying its excellent climb rate and outstanding manoeuvrability including loops with some 40's and definitely with a 60.

The combination of large balloon wheels and high ground clearance is perfect for those very low and slow fly-by's with 'nose-up' and the wheels only inches off the ground, or for doing continuous touch-and-go's, typical manoeuvres that make those still, late summer afternoons so extra enjoyable. The impressive 'no-hands' stability and the visual impact of the light that shines through the colourful translucent wing, high in the sky,

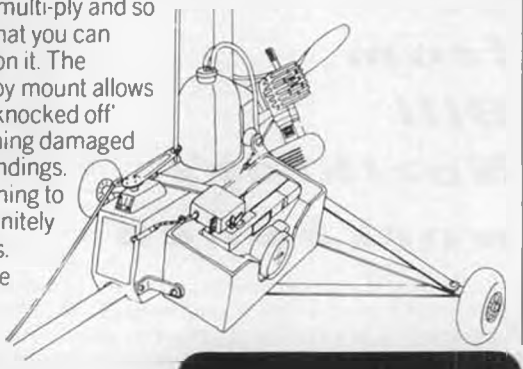


is a beautiful sight and guarantees to please the crowds both on the field and at flying displays. After the landing the steerable nosegear allows you to taxi back where after a few flights, you will really appreciate the pusher engine which leaves the craft and engine clean, since all exhaust matter is left behind.

Easy to Build, Easy to Rig, Easy to Repair!

The Windbag kit is complete. Besides the radio gear, the only extras you need are: engine, mount, prop and fuel tank. It is very easy to build with all metalwork pre-formed and pre-drilled. The engine mount, landing gear, noseboom and kingpost bolt onto the fuselage pod which is made of 6mm multi-ply and so strong that you can stand on it. The foreplane's alloy mount allows it to be easily 'knocked off' without becoming damaged during hard landings. If you are learning to fly you will definitely appreciate this. Even better, the rugged, bolt-together construction allows for most repairs to be done on the flying field rather than having to spend all week glueing all the bits together again.

On the field the Windbag rigs in minutes. It requires only three channels for the controls, up/down, left/right (including steerable nosewheel) and throttle. The streamlined cockpit is detachable and the Windbag can be flown without it. Other available channels can be used for example to do a 'toffee drop' or to trigger a camera mounted to the side of the Windbag. The cleanliness of the pusher engine, the slow flying speed and the 'no-hands' stability make the Windbag superbly suitable for aerial photography. The drawing shows a simple box with a self-winding camera mounted to the side of the fuselage pod



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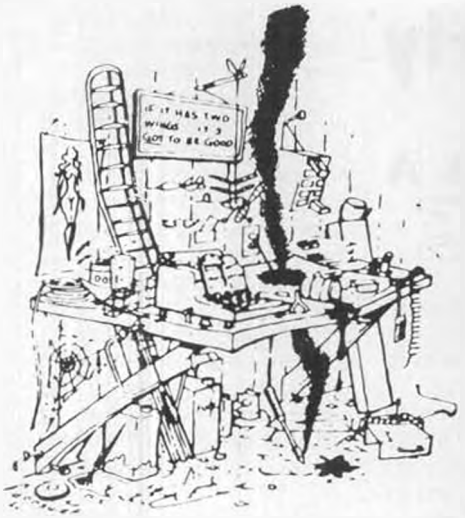


from Bill Northrop's workbench

The new O.S. Gemini 160 is actually a little less in overall width than the smaller displacement 120, which is shown resting comfortably on the nose of our nearly finished (at last!) Aeronca C-3. The new Gemini fits in exactly the same mounting holes required for the 120.

It's the first thing everyone asked when we returned from the 1984 Tournament of Champions, sponsored by Circus Circus Hotel/Casino in Las Vegas, November 7 through 11, so we might as well start this column with the answer. No, Hanno Prettner did not win the eighth T.O.C. in a row. Yes, he was there, but his biplane entry did not meet the intent or strict scale specifications set forth in the rules that were issued when the 1984 Tournament was announced two years ago.

The winner was Steve Rojecki, a captain in the U.S. Air Force, stationed in Florida, and an F-15 pilot. He, and second place winner Steve Stricker, of Maryland, both flew biplanes, while the other top five, Wolfgang Matt of Lightenstein, Ivan Kristensen of Canada, and Gunther Hoppe of West Germany, stayed with the monoplanes.

Photos and full details of this prestigious invitational world class event will be published in the next issue.

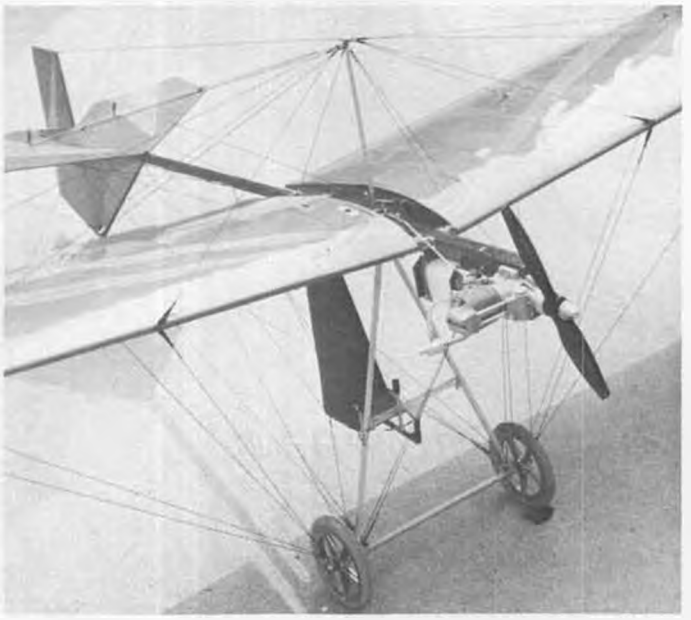
PLANS

Since starting our illustrated plans catalog series in the October '84 issue, we have received many favorable letters and verbal comments. In case you hadn't noticed, this series, beginning with the very first issue of *Model Builder*, will list every full-size plan available for which a construction article has appeared, right up to the issue in which the series comes up to date. Each listing is accompanied by a photo or sketch depicting the model subject. It goes without saying, that as each page of the listing appears, many new orders come in for plans of models long since forgotten or never previously seen!

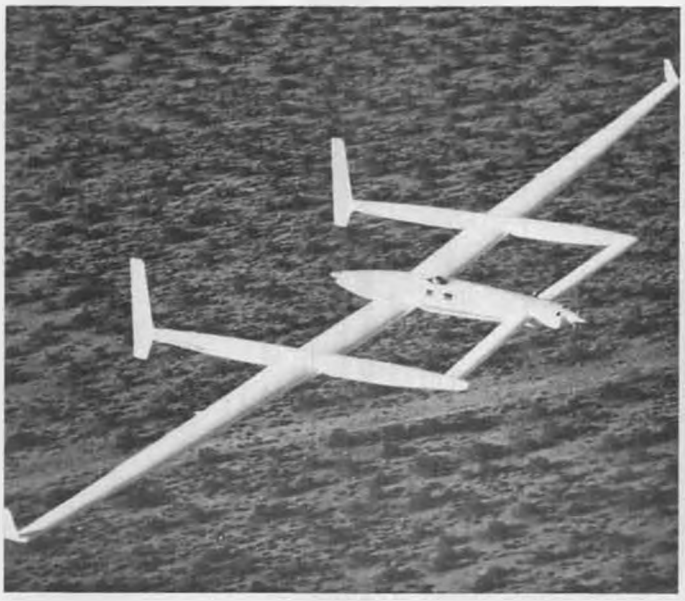
Recently we received a letter asking a question about the plans that we mistakenly assumed everyone might know . . . however, it could be that many other readers may be in the same boat . . . er, airplane . . . well, you know what we mean. The writer asked if we couldn't somehow let everyone know what issue a certain plan came from, in case the buyer would also like to purchase the relevant back issue.

Well folks, it's already done! The plan number you're looking at *is* the month and year of the issue in which the article appeared! It's a simple system that will never fail. The first one or two digits is the month, the next two are the year, and the last one is simply the first, second, third, etc. plan in that issue. Then O.T. means

Spill-out of kit parts for the Great Lakes Model Co. AT-6/SNJ/Harvard. All molded material is urethane foam. At least 1001 fittings!



Leo Hopper, Pomona, Calif., built this 1/4-scale 'Woodhopper' ultralight. Span 103", O.S. 61 four-cycle, weighs 7-1/2 pounds



The Burt Rutan designed "Voyager" for non-stop, non-refueled record flights. Will make first attempt at 23,000 mile round-the-world flight in 1985. Who will build the first flying scale model!?

The 1984 TOC winner, Steve Rojecki, with his teammates (l to r): designer/builder Ken Bonnema, mechanic Chuck Mills, Steve, engine builder Don Chapman, girl Friday Debbie Mallory, Reed Falcon A/C.

Old Timer, C.P. means Collector Plan, and so on. The only time the number code became a little confusing was when we were forced to combine issues, which hasn't happened in recent years. Plan No. 34781, for instance, was for George Clapp's "Torc" Trainer which appeared in the last such example, the March and April 1978 combined issue. Anyhow, just study this month's plans listings and you'll get the idea.

The real ulterior motive of this whole plan project is to compile a complete illustrated plans book to offer all interested modelers. As there simply is not enough time and manpower available to provide such a book in a one-shot project, we'll simply keep chopping at it a little at a time until it's completed. At present, there are more than 500 plans in our total listing!

INDUSTRY NEWS

Giezendanner USA, operated by Dick Penrod for the purpose of making available to U.S. modelers the fine line of R/C products manufactured by Bruno Giezendanner of Switzerland, former R/C Aerobatics World Champion, has moved all warehousing and shipping facilities to 304 Camsten Court, Wayne, PA 19087. The phone is 215-296-4699.

★ ★ ★

Most every aviation oriented individual has heard or read some material on the future non-stop, round-the-world flight of a far-out aircraft designed by Burt "Vari-Viggen," "Vari-Eze," "Long EZ" Rutan, and aptly named "The Voyager."

Just for clarification, there have been various flights "around the world" since 1924, but none have been non-stop, without refueling, nor around the true, 22,858 mile girth . . . not the aerospace industry, no government, no individual, not nobody no how! This is truly the last world aircraft record that has not been accomplished . . . not even attempted.

So why are we discussing it in a model magazine under the heading of Industry News? Because the only totally American instant glue, Satellite City's "Hot Stuff," has been used in portions of the construction of Voyager aircraft. Referred to as an *aeronautical trimaran,* the unusual Voyager is built of modern weight saving materials, such as carbon graphite, nomex paper honeycomb cores, Kevlar/fiberglass, and "Hot Stuff" and Super 'T' was used in the construction of trailing edges, to secure wire bundles, to secure fuel and vent lines, to fasten the windows to the fuselage, and typically where accessibility was a problem and/or an instant bond was needed.

The Voyager is designed to carry five times its weight in fuel. Span is almost 111 feet, the fuselage is 25½ feet long, the two booms are 29 feet long, and the canard wing (remember, it's Rutan) span is

Continued on page 99

Advice for the Propworn

Dear Jake:

What do you know about the new FM radios?

R.C.'er in Arkansas

Dear R.C.'er:

They work fine, but if you live in a remote or mountainous part of the country you'd be better off with a cassette player.

Jake

★ ★ ★

Dear Jake:

Why is balsawood so expensive?

Going Broke in Gainesville

Dear Going Broke:

Balsawood grows only in Ecuador where it rains all the time and everyone has a head cold. It is expensive because only 15% of the crop is exported each year. The remainder is consumed by the natives for canoe building and as a dietary supplement. "Balsa" is an Ecuadorian Indian word which means "light wood which becomes oil-soaked on a three-year-old Falcon 56."

Jake

★ ★ ★

Continued on page 98

OVER THE COUNTER

All material published in "Over the Counter" is quoted or paraphrased from press releases, furnished by the manufacturers and/or their advertising agencies, unless otherwise specified. The review and/or description of any product by R/CMB does not constitute an endorsement of that product, nor any assurance as to its safety or performance by R/CMB.

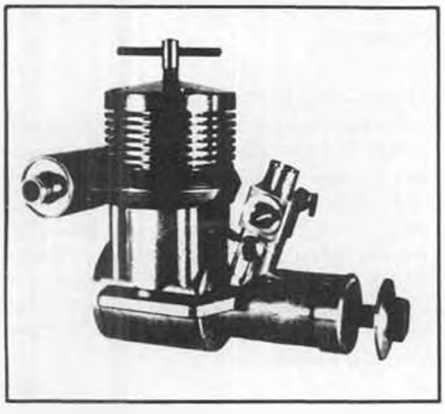
Lou Proctor really started something when he introduced the "Antic" to the model building public back in the sixties. A scale-like model of the 1914 era, its wire rigging and open aft fuselage structure caught the fancy of many an R/cer. Some years later, several European model manufacturers picked up the idea and introduced similar but less structurally complicated designs. The most popular being the "Baron," with completely covered fuselage. In fact, the "Baron" seems to have become the European Ugly Stik, with whole contests; racing, aerobatics, combat, special events, just for Barons only!

Early last year, Top Flite came into the picture, when it introduced the "Elder," designed by Scott Christensen. For .19 two-cycle power, it was (is) a perfect match for the HP 21 four-cycle, and features the Antic-like uncovered aft fuselage.

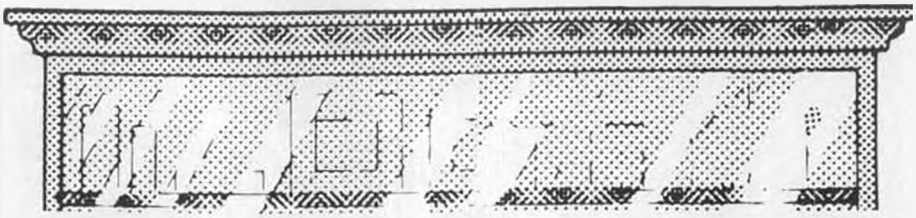
Now Top Flite is introducing a larger version of this obviously successful kit. The Elder 40 is a scaled up 20 and has ailerons as an added feature. It's a natural for the increasingly available four-cycle engines in the 40 to 49 range, or for .35 to 45 two-cycle sizes. With a span of 65 inches, and 783 sq. in area, the flying weight is 60 to 75 ozs., and it takes four-channel radios.

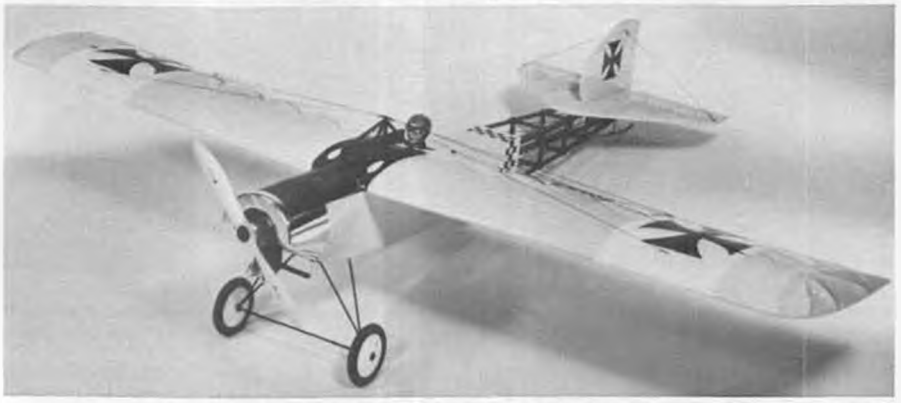
The kit features balsa and ply construction, hardwood fuselage and tail section, and precision die-cut parts with a printed identification system. A complete hardware package, shock-absorbing landing gear, large radio compartment, and highly detailed, full-size, rolled plans with step-by-step instruction manual, are additional features.

For more information and the latest catalog with MonoKote color chart, send request with $2.00 to: Top Flite Models, Inc., 2635 S. Wabash Ave., Chicago, IL 60616, and tell 'em you read about it in **MB**!



P.A.W. diesels offered by Eric Clutton





Top Flite's Elder 40. Enlarged Elder 20 plus ailerons.

Latest volume of Historical Aviation Album.

★ ★ ★

If your modeling friends complain about having to apply covering with dope, tell 'em if they don't like it to Stix-It! Stix-It is a new product from Sig Mfg. Co. that simplifies covering with just about any material except microfilm. It's a heat sensitive adhesive built into a brush-on liquid that you apply in a thin coat to your model's framework. You can now apply any fabric, plastic film, or iron-on material. It can also be used to apply silk, nylon, silkspan, or even tissue. Of course Sig's primary interest is to make application of it's top line covering material, heat shrinkable Koverall, an easier task.

Summary of features include: superior adhesion, strengthens balsa, very low weight, only one thin brushed coat necessary, reduces fuel penetration under covering material, saves time, and easy clean-up with Sig Butyrate thinner.

Sig "Stix-It" adhesive for iron-on covering.

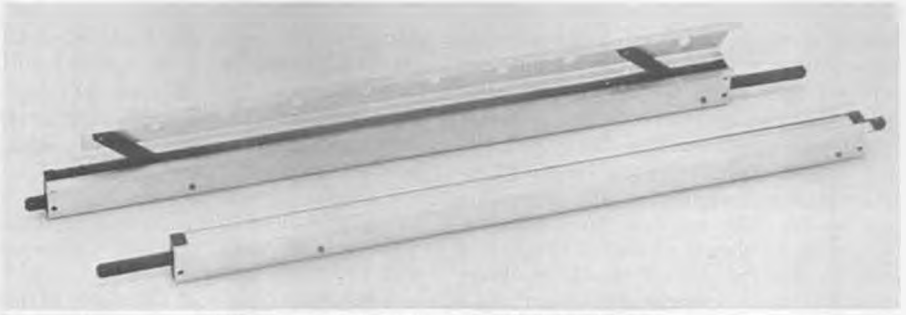
Speaking of Koverall, this heat-shrinkable material is 48 inches wide and the

Coverite's "Grabber" scewdriver.

Robbe "Buchhorn" customs boat.

Harbor launch/fireboat/tow boat from Robbe.

World Engines' foamboard "Wildcard".



Sailplane spoilers, ready to install, from Robbe.

grain runs perpendicular to the width. A five-yard package is only $10.95, or less than 24 cents per square foot. Also available in three and six foot lengths. It's a lightweight Dacron polyester based fabric. Comes in white only.

★ ★ ★

Coverite, 420 Babylon Rd., Horsham, PA 19044, is offering the "Grabber," a screw-holding screwdriver, for R/C applications. The price is $3.50, but if you send in $2.50 plus the instruction sheet from your latest purchase of any Coverite material (Super Micafilm, Permagloss, or Silkspun), Coverite will send "The Grabber" anywhere in the U.S., postpaid.

★ ★ ★

Indoor Model Supply, Box 39, Garberville, CA 95440-0039, is making a special offer. For $15, Lew Gitlow will send you, postpaid, a Peanut kit for the Zippy Sport, plus a copy of Bill Hannan's book "Peanut Power," along with an Indoor Model Supply catalog. Kit is complete with scale colored blue Japanese tissue, two plan sheets including 3-views and history for documentation, 1/20 balsa strips, and light sheet balsa.

★ ★ ★

The "Wild Card" is the latest trainer-type R/C model in the .25 engine size range, from World Engines, 8960 Rossash Ave., Cincinnati, OH 45236. The aircraft, in the pre-built category, is constructed of foamboard. Fuselage is one piece, with ply bulkheads and spruce bracing. Wing is also one-piece, bent to airfoil shape by a patented process and reinforced with a full length balsa main spar. With full symmetrical wing section and ailerons (no rudder), we'd consider this an advanced trainer, even though only three channels are required. As described, it goes where you point it, even though having good slow flight and gentle landing characteristics. For the pilot who wants to get a model in the air quickly. Price is $49.95.

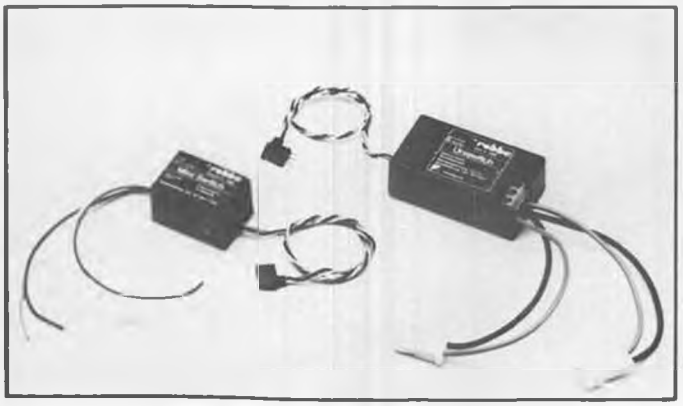
★ ★ ★

Robbe Model Sport offers a nice set of spoilers for your R/C sailplane. Measuring 9¾ inches long, they weigh a total of only 2.1 ounces, and include an internal mechanism lock that holds them in either the deployed or retracted position, yet require little servo effort for operation. Can be installed for "push to deploy" or "pull to deploy" operation. Installation depth is 11/16 maximum.

The Robbe Mini Switch and Uni Switch plug into your receiver, replacing a servo, and are used to act as an on-off switch for electric devices. The Mini acts as a switch only, and will handle up to 30 volts at one amp, measures 1 x 3/4 x 1-9/32 inches. The Uni Switch also handles 30 volts, but up to 25 amps. It features a heavy duty relay with internal suppressors, and block connectors for easy hook-up. Many switching variations can be accomplished using two Uni Switches with a "Y" cable, including reversing, step-switching, operating two devices, etc.

Two more Robbe electric powered boats are shown this month. The "Dolly" is a 1/20-scale Harbor Launch, which can also be outfitted as a fire fighter. Flashing lights, siren, and diesel sound generator can also be added. The fire fighting unit includes water cannon, geared pump, connectors, hoses, and assembly items. With tug harness, "Dolly" can tow boats weighing up to 30 pounds. The "Buchhorn" is a customs boat, with mold-

Continued on page 64



Robbe Mini and Uni Switches.

Combination offer from Indoor Model Supply.

Pattern × Flying

By DICK HANSON

Let's talk about basic design criteria this month, plus try to understand common claims which may have just a little myth in them.

Much of what design work we see, is done on a simple whim or based on an isolated observation...for instance, a classic misinterpretation is that "a heavy plane flies better in the wind." True, a glider is often ballasted to gain better penetration in wind, but we are not concerned with flying machines which use gravity as the moving force. We are using *powered* aircraft. Further, the size of the airframe relative to its weight is not a constant ratio but is varied greatly depending on the Reynolds numbers involved. (The Reynolds number is related to size, speed and air density). Let's re-word the above quote to read, "A heavy plane maintains a straight line better in the wind." We are really sorta working at a ballistic shot.

Another classic is the airframe which "flies crooked in the wind." *No* airplane which flys straight in calm air will fly crooked just because there is wind. *If* however, *you* choose to hold a fixed course across the ground, the wind can affect the amount of "crabbing" required to hold that straight line. The real culprits are low speed and *perhaps* the lateral area distribution.

One of the *best* flying planes I've had which incidentally answered many questions for me, was a "scat cat," a 500 square-inch quickie type model. At 3 lbs. the stock KB 40 allowed spectacular performance. The real eye opener, however, was the fantastic low speed performance. Even using a 12% airfoil, the power-off diving speed was quite modest. Since that time, we have gone to lower wing loadings and thinner airfoils. The results have been *positive* to say the least.

Another old design idea which I have yet to see produce winning results is the old *"everything on centerline, no dihedral!"* approach. Sure this set-up will fly...so will a 2 x 4. I personally feel that built in stability, ie, dihedral, raised thrust line, raised stab placement, have much to offer and frankly I have not been able to improve on this concept. The models set up this way seem to *lock in* better and have better hands-off stability.

I am certain that various design concepts will gain favor from time to time, but for now, most of the winning designs follow this setup fairly closely.

The *fine* points in design, such as belly pans, internal pipes, and flaps, are really non-critical options in my opinion, sorta like white wall tires. If you want to try something which will yield positive results, work on improving stability *without* producing coupled control reactions.

Enough preaching. If you simply haven't the time to design and build too, let's look at some building techniques that you may not have tried.

If you look closely at the photo of milk bottles you will see the wings laid up beneath 3/4-inch thick particle board. This technique only works on foam cores which are cut from fully squared foam blanks. The milk bottles weigh about 8 lbs. each, and that gives about 80 lbs. as shown with 10 bottles of water. That's plenty for an 800 square inch wing. Figure 400 square inches (remember the halves are stacked) under 80 lbs. I believe that's about three ounces per square inch.

Using two good straight edges and checking each side and ends of the boards, you can perfectly align the cores. From that stage on, if you did it right, you need not measure anything, just compare halves.

If you have cores which look bowed or if the blocks were not squared correctly *top* and *bottom,* this technique *will not* work. We square *all* of our cores because it reduces the time spent in determining perfect alignment and shape during the assembly process.

Another building technique we like is the removable stab and fin arrangement. The photo shows the oversize holes in the stab which permit fin offset, which acts sorta like engine offset. Using this setup, you make the critical adjustments after flight testing. This eliminates much time spent trying to evaluate real center lines, angles, etc., while building the plane. You will be amazed at the difference small stab and rudder adjustments can make!

My T-750 had a funny rolling characteristic that finally disappeared when I realigned the stab to a perfect center position ..one tip was a little low.

I would like to pass on my results with the Tipo 750 I modified for turnaround pattern. The mods included large ailerons, rudder, and elevators, *plus* an O.S. 90 four-cycle engine. This 7-1/4 lb. bird really works using a 12 x 10 D.W. prop and 25% nitro fuel (15% Dick McCoy oil).

On Sept. 29/30 we took it to Las Vegas for the annual contest. My friend Dave Stuart flew it in Expert class and won by a comfortable margin. Dave got 4th in Expert using a new Tipo 825 at the NATS this year, and because of an unexpected servo failure, was suddenly without a plane four days before the Vegas contest.

The week before we had done some comparison flying between the special T 750 and the T 825. The speed difference was a big surprise. The 825 sounded *much* faster! In actual comparison, it was only slightly faster. The judges, as were a number of fliers, were taken with the even speed through maneuvers.

We also took my Dalotel to the contest and flew it in turnaround.

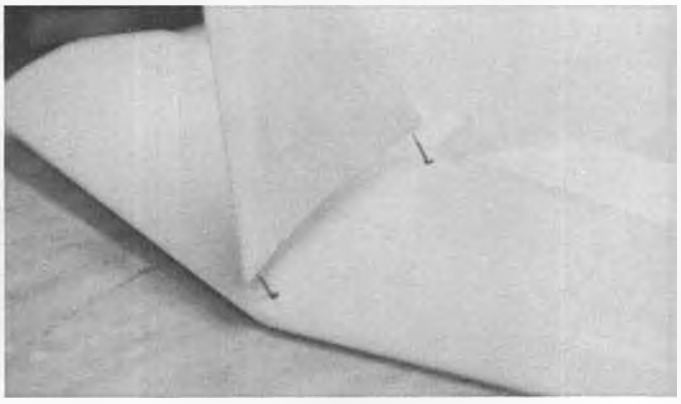
Don Weitz and Tony Bonetti made a last minute decision to fly with us but not owning any pattern planes, they shared mine. It looked like a team race event; fly, land, refuel, fly, land, refuel...

Gordon Hyde (Chip), however, using *his* Dalotel, beat all of us. I guess mine just got tired.

My Dalotel was set up for high altitude flying and seemed a little too fast for best results, but the real difference was Chip's flying. There *is* no substitute for ability and practice.

We now have a new state park in Salt Lake City which includes a beautiful exclusive RC aircraft field! I hope the chance to fly more than once a week will improve my flying so that the younger set doesn't win so easily. •

"You in the back row without a hat, take ten laps around the barracks!" Skinned foam cores curing under pressure.



Clearance holes allow important fine adjustment.

SEGUIN FAN FLY

By BARON LUFTWING WOLFGANG von JETSKI . . . The Baron brings us his personal reactions to The Greater Southwest Second Annual Fan Fly . . . a weekend without propellers, and we don't mean sailplanes!

"The sun is riz, the sun is set, and where the heck is Seguin yet?" Sounds like mein hometown of Dinkelsbuehl, Germany. Word had come to the Baron Luftwing Wolfgang von Jetski that model airplanes would be flying in Seguin, Texas...without propellors! Could this in fact be possible?

After locating Texas on the map, the Baron found that Seguin was about 1,300 miles from the southern part of Florida, 1,400 miles from the southern coast of California, and 1,200 miles from northern Ohio. Certainly no one would venture that far for such an activity. But lo and behold, some flew in, some drove in, and the Baron came on the train.

On Saturday, the Baron found the weather to be cold and a bit damp. Winds were chilly and blowing with mucho gusto. Was this not Dinkelsbuehl, Germany? However, the sign read, "Randolph AFB Auxiliary, site of Tri-Cities Radio Control Fliers." The Baron had located the correct spot. He was amazed to find people arriving from the east coast and the west coast, as well as from Ohio, and various points in between.

This F-100D was designed and built by Art Johnson, Delray Beach, Florida. Powered by a Rossi .81 and Byrojet fan unit.

Due to the strong morning winds, the Baron had an opportunity to observe the unloading and feel the mood. The tone at the field was one of high interest and excitement as participants arrived and unpacked their models. "Ach du lieber," the Baron remarked..."A big hole in ze front and a big hole in ze back!" Another glance around proved that all were indeed two-holers!

There was a considerable delay in getting the flying started, as the wind was doing its level best to keep everything grounded. Meanwhile, there was plenty of opportunity to walk around to see who was there and what kinds of models had been brought.

Byron Originals arrived from Ida Grove, Iowa, with their trailer which housed about 10 models, including a team of two F-16 Thunderbirds and an SR-71 in NASA paint scheme. Larry Wolfe, from Jet Hangar Hobbies, brought the prototype for his new .45-.65 powered F-86F painted in Skyblazers scheme. In addition, he displayed a 100% scale F-20 Tigershark which his company had built as a flying research vehicle for Northrop Aircraft Corporation, as well as his immaculate and almost finished A-7D Corsair II complete with functioning leading and trailing edge flaps, spoiler deflectors, speed brake, and

Twin-seat Mirage III. Set speed record. Owned by Bob Walters, Florida. Turbax III and O.S. .65 VRDF.

Southwest Airlines 737, owned by Tom Street. Two Turbax I's and K&B 7.5's.

Chrome Monokoted F-86, built from House of Balsa kit.

Jet Hangar Hobbies prototype F-86F. Will be sport scale kit.

Jet Hangar fleet: F9F-8 Cougar, F-20 Tigershark, A&-d Corsair, F-86F Sabre Jet, and F-100D.

Mirage 2000 owned by Charlie Cox, Houston, Texas.

Jet Hangar prototype F-100D, with owner, Kenny Perkins, Memphis, TN.

about a million tiny decals which will be included in the kit. Larry said he was entertaining thoughts of trying to qualify for the World Scale (FAI) Championships with his A-7. It is that accurate! Tom Cook, of Jet Model Products, was also in attendance. He brought only his F-4 Phantom. Bob Martin R/C Aircraft (formerly House of Balsa) was represented by two F-86 Sabre Jets, one powered with an RK-20B and O.S. Max .25 ducted fan engines, the other powered by a Kress 740 fan and O.S. Max .46 fan engine.

Further inspection revealed a total count of approximately 65 ducted fan models in various stages of construction. Engine sizes ranged from .049 to .81 cu. inches. Of total airplanes at the site, roughly one-third of them were flown. Approximately 12-15 were scratch-built designs, including early prototypes of Jet Hangar Hobbies' future F-100 and F9F-4/5 Panther kits. Of the remaining models displayed, there appeared to be a fairly even split between Byron Originals' and Jet Hangar Hobbies' kits (with perhaps a slight edge to the Byrons). In the scratch-built category, a few more designs were seen using the Turbax fan units rather than the Byrojet.

Before long the Baron's attention turned abruptly to the brp-brp-brrrrp-brp of an engine starting. He looked around to see a man in a blue shirt hovering over a black Monokoted delta-wing firebird (Jet Hangar Hobbies KFIR) revving up to fly. Braving the elements and breaking the proverbial ice, Don Muddiman, lead pilot for the Cloud Dancers Show Team from Kissimmee, Florida, pointed his KFIR into the winds and...was ist das?...rolled it on take-off! Without a doubt, it was one of the most spectacular flights the Baron saw...complete with loops, rolls, inside and outside maneuvers, high-speed passes, very low *inverted* high speed passes, and an almost unreal demonstration of hovering flight.

Only a few others were as brave as Cloud Dancer 1 until afternoon when the

Byron F-86 from the Byron fleet, Ida Grove, Iowa.

Bob King's Grumman Panther, a Jet Hangar prototype for future kit, and a Byron Mig 15 by Bobby Zieger.

sky cleared and the Baron actually experienced more typical Texas weather. When it became apparent that weather conditions were turning to "severe clear," the fair weather pilots began bringing their planes to the flight line for final engine runs, and serious flying was underway. As the temperature rose, so did the demand for the colored sticks "frequently" known as frequency flags. Final testimony to the success of the event is shown in the fact that there was only one major crash over the two days, and further, no one really seemed to experience much exasperation with engines.

Soon Don Muddiman was joined by a Byron F-86. Tom Street got several flights on his scratch-built Southwest Airlines 737 with unmuffled K&B 7.5's on two Turbax I fan units. It flew quite well and had good speed, but was the top contender for the Baron's Noise Pollution Award! Larry Wolfe took his eight-year old Blue Angel A-4 Skyhawk up in the mighty winds and later his F-86. Both are powered with Turbax III's and K&B's soon-to-be-released .67 cu. in. ducted fan engines. The .67's performed very reliably and proved to be easy to start. They appeared to have extended idling qualities and provided brilliant performance in the air. At one point, Larry's F-86 took off, followed shortly by two Byron F-16's. They each provided good all-around performance. The F-16's landed after 8-10 minutes in the air and Wolfe continued to putter around the sky for another 4-5 minutes. He surely earned the Longest Flight Award...and upon landing taxied back to the pit area and still had a quarter tank of fuel remaining. Fuel economy must be quite good on the big K&B engine despite the fact that he began with 24 oz. of fuel and a dry weight of only 8-3/4 lbs.

Cloud Dancers' three KFIR's in their Firebird MonoKoted schemes. No. 1 Don Muddiman (seen in lead photo), No. 2 Tommy Veloskey, and No. 3 John Davis.

As the afternoon progressed, Bobby Zieger, a local Texan, flew his silver Byron Mig 15, and Mike Kulczyk put up his House of Balsa F-86, which flew with a Kress 740. It was just a bit faster than the F-86 with the RK-20B, although both flew well in their size category. Dave Dial, from Houston, flew a Colombian Mirage with Turbax III, and Charlie Cox did a nice job of flying his Blue Angel Cougar with a Turbax III and O.S. .65 VRDF. Art Johnson had a very nice scratch-built F-100 which he had rebuilt after the Masters. He appeared not to get a very good engine run, however, so the aircraft did not perform as perhaps it might have. Bob Walters' two-place Australian Mirage earned the official "Fastest Speed Award" given at the close of the activity on Sunday. Based on the average of one upwind and one downwind high speed pass, his Turbax III powered aircraft was clocked at 118 mph.

Bob King, another Texan of local origin, had a colorful Panther painted up as a drone, which looked good in the air and flew impressively on a Turbax I with O.S. Max .46. It was the only straight-wing jet to fly. Tom Cook put two flights on his F-4. It was big and had impressive speed, but the only maneuver he did with it was a roll. The most impressive overall Byron aircraft of the weekend was Hugh Jones' camouflage A-4 Skyhawk. Hugh owns J&J Hobbies in Austin and is one of the original organizers of these Texas Ducted Fan Fly-in's.

The Baron's Unfinished "Monster" Scale Award must go to Butch Sickles, from Breckinridge, Texas. He displayed a partially completed Concorde which already weighs (with engines and fan units included) 33 lbs. He expects it to top out at approximately 50 lbs. upon completion. It will use four Boss 601's with Rossi .81's mounted on the bottom. A super ambitious project...and much luck to Butch! Just goes to show you should never challenge a Texan!

Toward late afternoon the Byron Boys flew their NASA painted SR-71. It was massive and definitely the most unusually

Continued on page 70

Another view of Bob King's Navy blue and yellow Grumman F9F-4/5 Panther. A rare straightwing jet in this day and age!

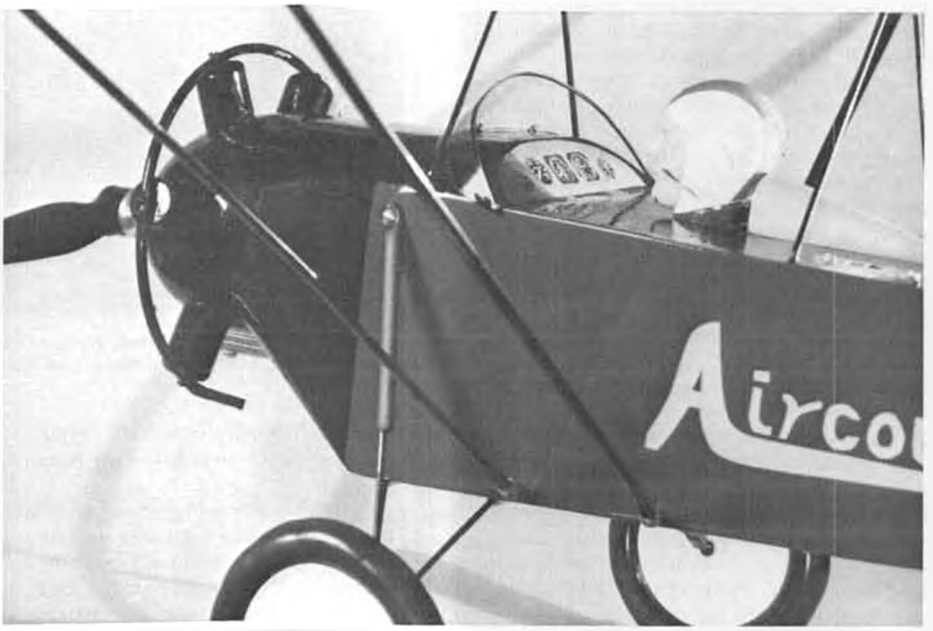
Inside of Jet Hangar F-86F, showing 24-ounce fuel capacity.

Byron F-86 by Jim Foy, Ida Grove, Iowa.

Tom Cook's well-known F-4 Phantom.

STU RICHMAN'S
AIRCOUPE

Walt Mooney's August 1984 Peanut Scale Model scaled up for .15 to .19 (or 21 Four Cycle) Engines and Three Channel R/C



Don't worry about all those struts. They're designed for easy building and aligning.

Sunday Scale Aircoupe was inspired by Walt Mooney's Peanut in centerfold of Aug. '84 issue of MB. Just right for .15 to .20 . . or HP .21 four-cycle. The hat? He and Al Tuttle are buddies!

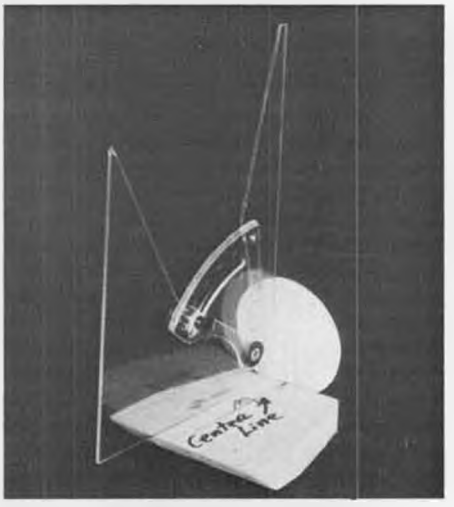
There's a lot of area crammed into that 45" wingspan! Stu's 'coupe is covered in light and dark blue MonoKote. Red, white, and dark blue stripes on left wing panel. Lettering hand-cut.

CENTERFOLDS...OH, HOW I LOVE CENTERFOLDS!

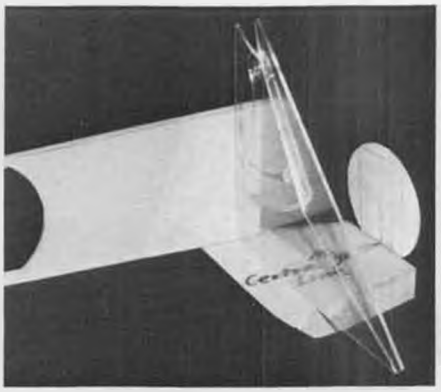
Every month I read most of the American model magazines, plus Modelar from Czechoslovakia, Airborne from Australia, two magazines from Britain, and from other countries like France and Poland, I frequently see several issues each year.

BUT IT'S THE *CENTERFOLD* IN **Model Builder** that has been my "turn on" for many years. Each month I grab **Model Builder** and lay it out flat to its centerfold and study the lines, curves, and the beauty of what I see...and I start to fantasize! All the 10¢ kits of Megow, Peerless, and Comet have been pinned to my building board in years gone by...maybe the **MB** centerfolds draw me back to my youth. I wonder if I could still make a gum band model fly...would I remember how to trim it...would it be a waste of time...would the guys laugh at me?

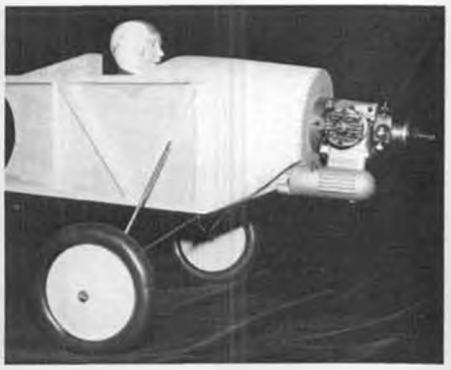
When MB's August '84 issue arrived and the centerfold presented Walt Mooney's Peanut Scale version of the Elias AIRCOUPE, ecstacy had arrived...the "turn



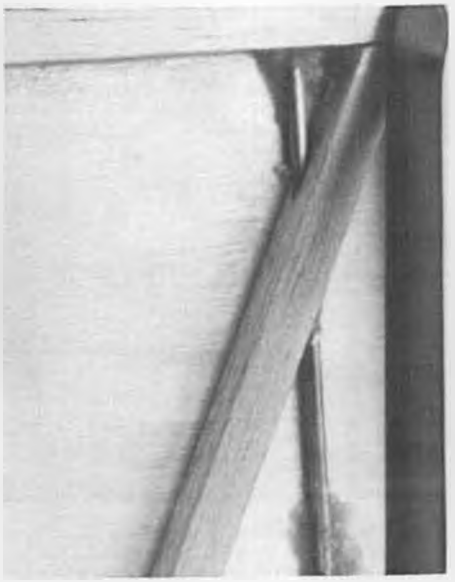
Fuselage starts with gluing firewall to top block "B", at 85°, for downthrust. Adjustable triangle is a handy modeler's tool.



There's that triangle again! Sides are glued to block "B" at 90°, ply doubler side in!

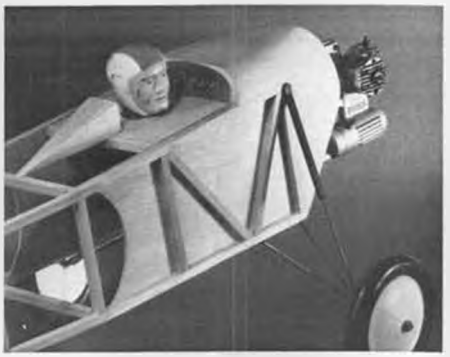


Carve recessed area to fit your engine's muffler. Later change to an Enya .19 required cutting off 'stinger' of .19's muffler. No problem.

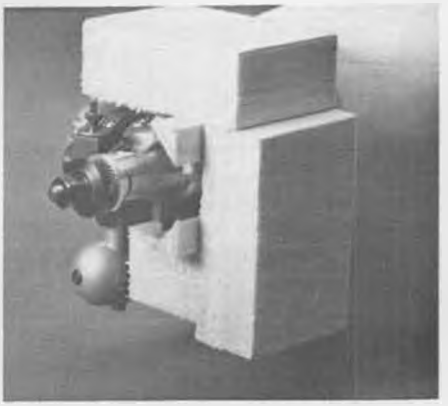


For touch of realism, upper end of oleo strut is covered with black heat-shrink tubing. Cut one oleo from each wing strut tube, no waste!

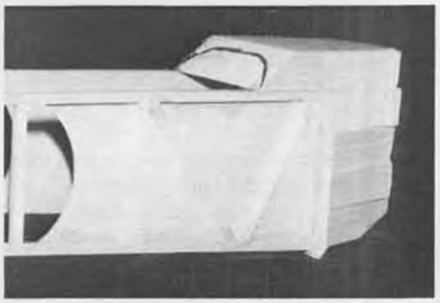
Block "C" and tank platform added. Kraft KM19B mount fits most .15's to .20's. HP21 requires KM40 mount. Sheet balsa pads bolts.



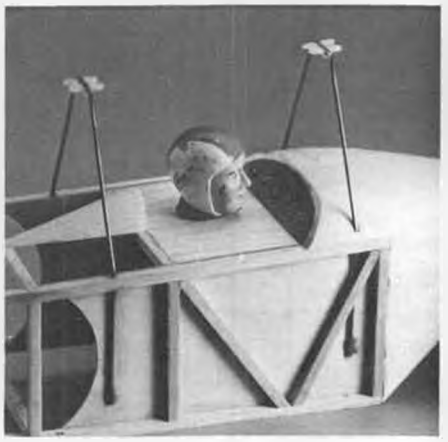
Instrument panel, Williams Bros. pilot (getting a little nosey here!) and headrest are trial fitted. Wood screw still to go through top of gear.



"Don't fence me in!" Engine gets surrounded with soft blocks, to form cowl. Lottsa carving!



Soft 1 x 1-inch blocks cut to fit between firewall and bulkhead "D". No plastic here!

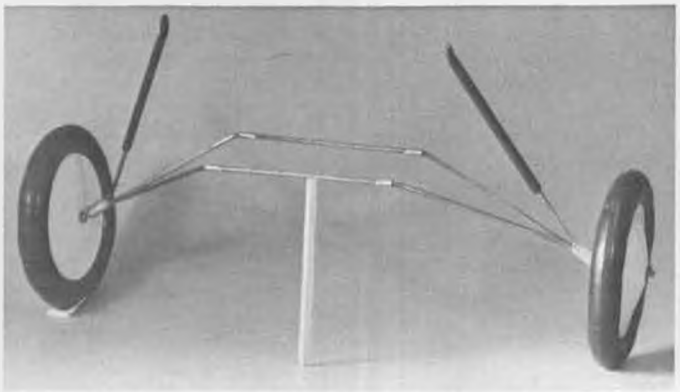


Cabane struts set in place, adjusted for 1/8" incidence, and epoxied to ply doubler (roughen wire before gluing. Simple process, no?

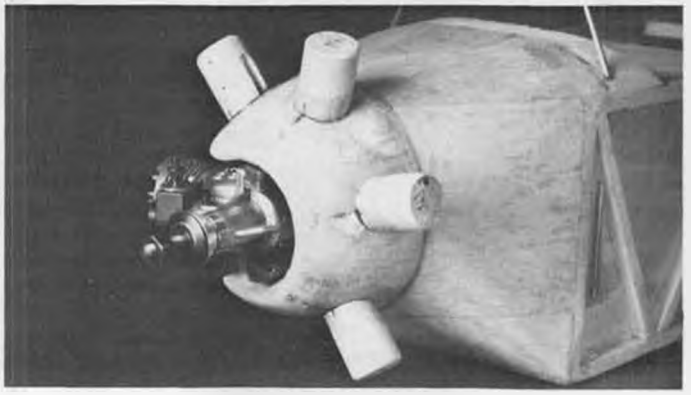
on" was immediate...I *had* to build that cute little parasol. So here we present, nearly stick-for-stick and strut-for-strut, a wonderful flying R/C version of Walt Mooney's PEANUT that is simply a "buncha fun to build and fly." It is super-stable for every-day, Sunday R/C flying.

Editor's Note: Unbeknownst to Stu, his Aircoupe project almost hit right on the button an idea that **Model Builder** *and Roland Boucher of Leisure Electronics have been kicking around for the past few months . . . electric powered R/C Peanuts, scaled up four times! Although our idea would normally produce scale models with a wingspan not over 52 inches, there may be no reason that they can't be less. Watch for a design-and-fly contest along these lines in the near future. Meanwhile, we'll experiment with photographic blow-up reproduction of some of our more interesting published Peanut designs.*

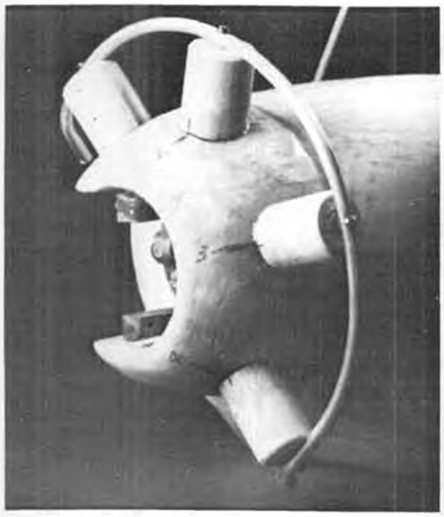
The real Aircoupe used the Curtis Challenger engine that was so successful in the Curtis-built airplanes...it was an ideal power plant...had two banks of



Completely assembled landing gear. Wire is 3/32. Brass tubing brings size up to fit stock L.G. clamps. K&S streamline alum tube "Shocks".

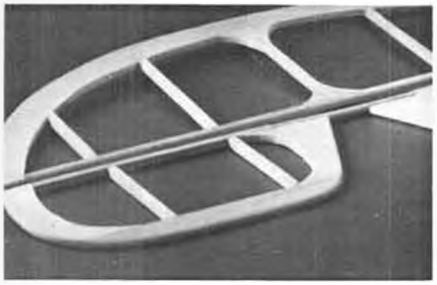


Engine cowl fully shaped and sanded (and the engine has stopped complaining). Dummy cylinders are cut from 3/4-inch dowel.

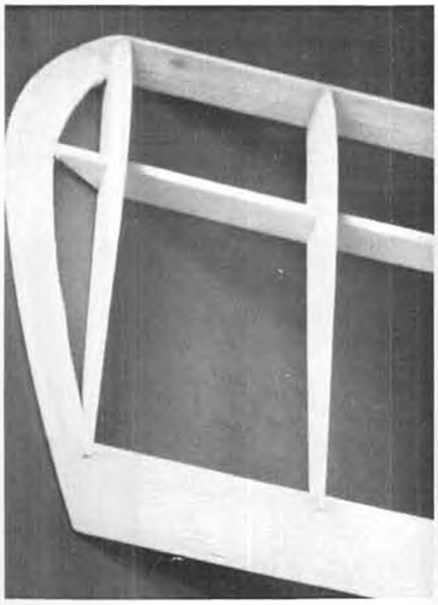


K&S brass tubing bent around jelly jar to form exhaust collector ring. Fuselage front ready for Pactra Formula-U Raven Black spray painting.

Center rib is ply, used as blank to cut others. Ply plates added to support wing mounting blind nuts. Wing not removed since finished!

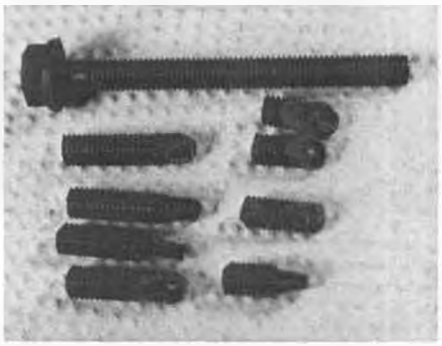


Aircoupe's structure is simple but strong. Builds like a "big" 10¢ model of yesteryear. Note dowel connecting split elevators.



Wing tip is angled up to meet top of spar. Be sure to balance wing at center rib before covering, to avoid later trimming problems.

Low angle shot shows simple but functional strut attachment. They could be bolted on permanently, as the plane is relatively small and easy to transport.



Du-Bro 10-32 nylon bolts cut to various lengths, tapered and drilled, provide handy removeable strut attachments. Easily replaced.

three cylinders each, and a shaft with dual cranks. The engine was built from about 1928 to 1935, and preceded dual ignition systems. The exhaust collector ring served all six cylinders in staggered succession.

Our simple SUNDAY SCALE version was planned for a bit over 400 square inches of wing area and three pounds with three-channel radio gear and a trusty O.S. .15R/C engine. Any .15 to .20 engine should be suitable...and an HP .21 four-stroke COULD BE PERFECTION! The plans show all needed data.

The Williams Bros. pilot and wheels really add a touch of class. You may have to lie to your wife a bit about the wheels...I told my wife they only cost $1.85 a pair...Hawwwwwww. Fun is where we find it.

I wasn't satisfied with the 4:1 wing aspect ratio for flight dynamics (what words), so the aspect ratio is 4.75:1 and the wings are both carrying 3/16 washout as measured at the wing tips' trailing edges. Leave out the washout and you're liable to have a model that flies like a "bag of worms"...be so warned! USE THE WASHOUT.

Also be sure the rear of the top longerons taper at the stab mount to yield *positive* incidence at the stab EXACTLY as shown on your plans. The cabane strut mounting may look questionable, but it works and is easy to set to the plans' dimensions. Five degrees downthrust is needed, and we added ONE washer of right thrust after the first flights and we now track straight under full power as well as in the glide.

The radio system was mounted as far forward as possible and our prototype balances RIGHT at the wing spar...and

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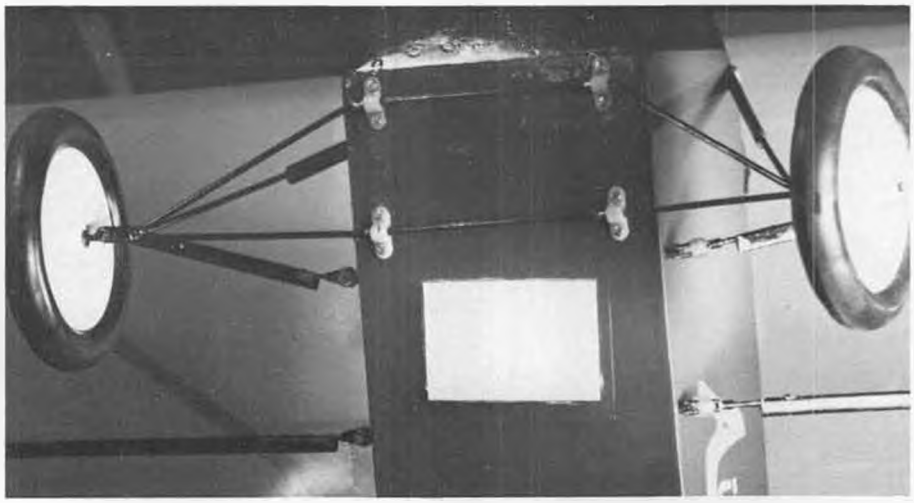
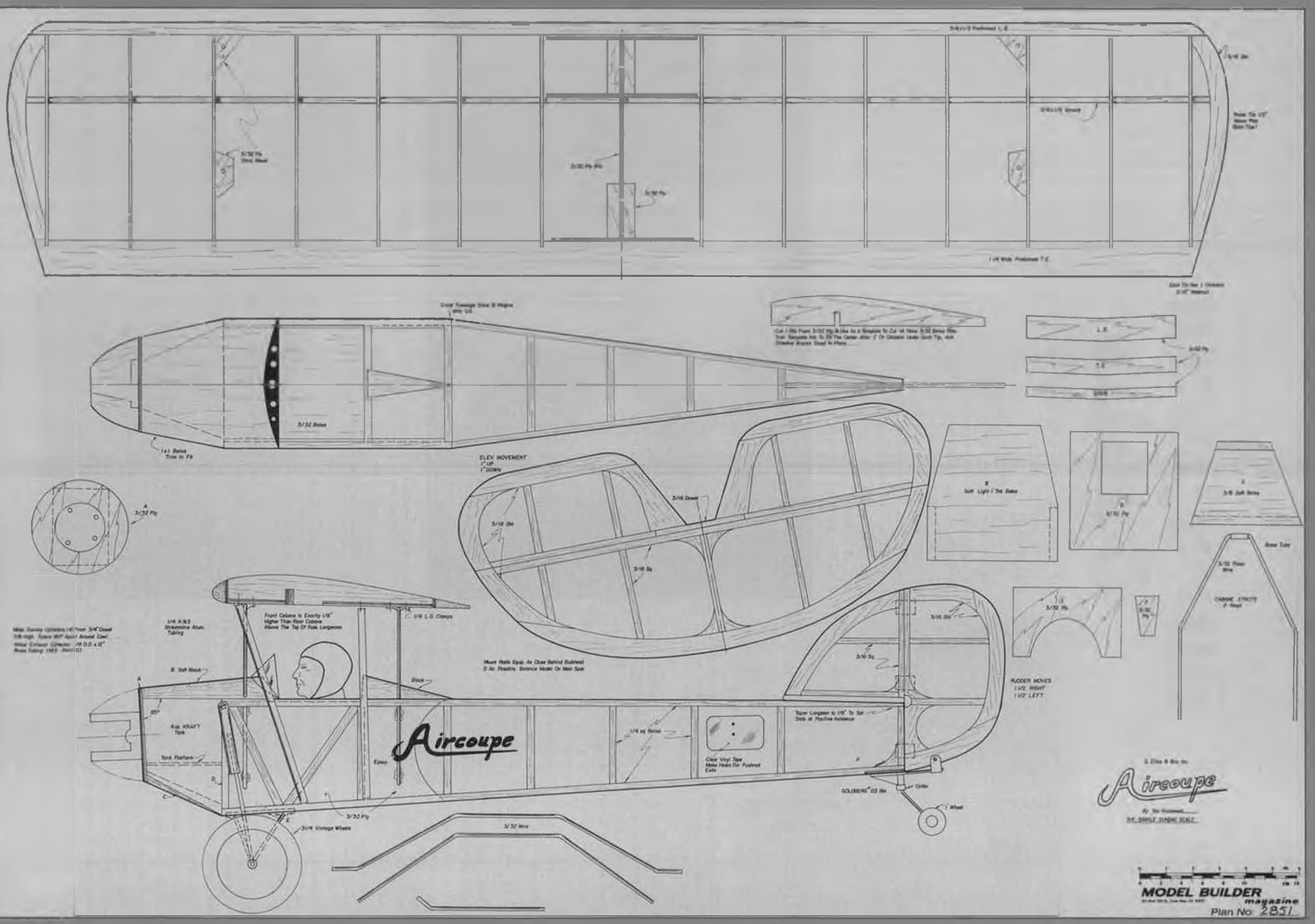


Close-up shot of underside shows strut attachments and nylon landing gear clamps in place. Stu sealed radio in, covering bottom last. Removeable hatch can be made, or lift cockpit floor.


Aircoupe
MODEL BUILDER magazine
Plan No: 2851

European Scene

BY CEES KAIJIM

Radio controlled parachuting is catching on in Europe! Several contests have already been held. Soon to be introduced to FAI.

The first official European pattern (F3A) championship, held near the Belgian city of Genk, was, at the same time, the first major turn-around meeting for the European aces. It was a pity that the event suffered from the weather conditions, wet and windy most of the time, but the competitors had come to fly and that is what they did, despite the weather.

The first European F3A champ is Wolfgang Matt, from Liechtenstein. He accomplished this with his special turn-around design, named "Joker," powered by a longstroke Webra engine. Bertram Lossen (West Germany) with his O.S. powered Challenge was second, while Gunther Hoppe and Werner Schweikert (also West Germany) came third and fourth.

Yes, indeed, there is a famous name missing. Unfortunately, Hanno Prettner had to stay home, because his trusted helper, his father, was ill.

In 1985, The Netherlands have the honour of organizing the F3A World Championships. No date has been set at the time of writing this, but the site of the meeting has already been chosen. It's the "Flevohof," a recreation park in an area of land reclaimed from the Zuiderzee, a former inland sea. It lays, in fact, below sea level, but don't worry, the rumor that competitors will have to prove their swimming ability before being allowed to compete is most definitely not true!! The contest will be organized by the Koninklijke Nederlandse Vereniging voor Luchtvaart (try to pronounce that!), in English, the Royal Dutch Aeroclub. Last year they ran the European F3B Championship at the same site, so a high level contest is nothing new to them.

CRASHING

Yes, we do crash too, here in the Old World. Not that we like it, but it seems to be inevitable. A very spectacular one was the mid-air I had with my brother Henk's airplane. Our trainer-type airplanes were the only ones in the air, yet we somehow managed to fly frontally into each others propellers. An explosion-like sound was followed by an almost uncanny silence, and it started to rain shredded parts of wood, covering, engines and radio gear. Nobody to blame, of course, but I bet that it you were trying to do that on purpose, it would take you days and even then you might never succeed.

R/C PARACHUTING

Radio-controlled parachutists are not entirely new. About nine years ago, a design for a controllable jumper appeared in the German and American magazines. Based on that design, several modellers experimented further with the idea, and some quite well working examples were built. As far as I am aware, however, there have not been many...if any at all...commercially produced and generally available R/C parachutists on the market.

This has changed now, as the German firm Robbe (also represented in the U.S.A.) has seen this gap in the market and is offering "Charly" for sale. Charly is a 16-inch long doll, with enough room in his soft plastic body for normal size radio gear with two servos. Charly hangs under a 40 x 28-inch parachute of the modern "square" or "ram-air canopy" variety. We call this type of parachute a "mattress," but

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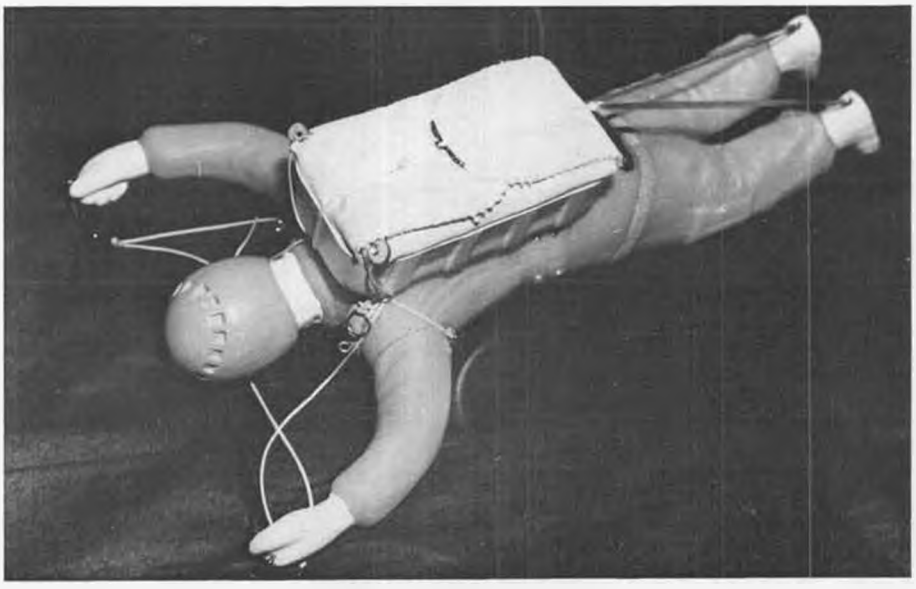
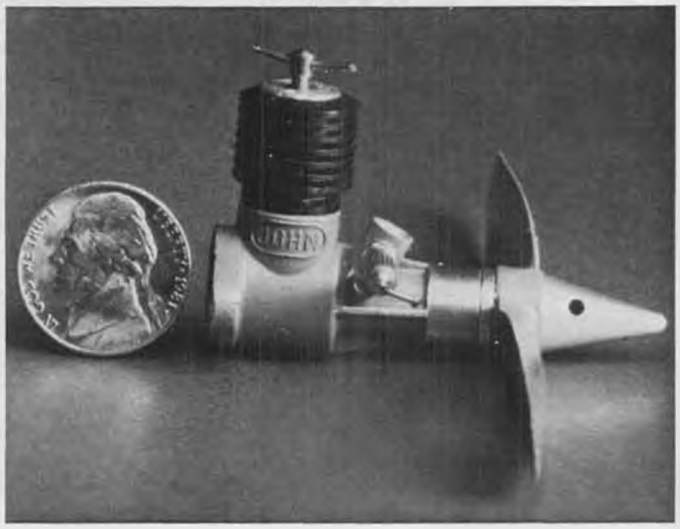


Offered by Robbe in kit form, "Charly" is 16 inches tall, carries two servos. Chute is 28 x 40 inches. Releases and steers by radio.

The author takes Charly up in this Piper Cub workhorse, drops him at 7 to 800 feet, and brother, Henk, "flies" him down. See text.



ENGINES OF THE WORLD
...by Stu Richmond

JAN GARCIC'S DIESEL

An American nickel looks big compared to Jan Garcic's "John" Normal diesel. His own interesting modeling history is presented in this month's column. Jewel-like engines rated highest by Richmond.

VITAL STATISTICS

Only 2-3/16 inches long, 1 inch wide across the mounting lugs, and 1-5/16 inches high to the top of the fins: tuned pipe versions are 5 inches total length. All three engines are 0.3 cc (.018 cubic inch) displacement. "John" Normal weighs 24 grams (just under 1 ounce...28 grams = 1 ounce). "John" Racer weighs 30 grams. Maximum power at 18,000+ RPM's. "John" R/C weighs 32 grams. Speed range from 8,000 to 18,000 RPM's.

UNIQUE FEATURE

The writer's "John" R/C engine rates a PERFECT TOTAL SCORE OF 30!...certainly among the finest engines in the world!

If small is satisfying, as a modeler recently wrote, tiny is TANTALIZING! Our present camera lenses hardly do justice to these intricate little screamers we're featuring this month. For eight months I searched Europe by letters to find the maker of the "John" engines...I wanted to learn the history...and I wanted a "John" for myself and Bill Cooksey in New Zealand who was coming to visit. The two "John" engines arrived the last day Bill was here...and the search and seek mission, with much anxiety and fun, was over and we each had a new and tiny jewel for our collections.

But the story just starts there...here, for the first time ever, **Model Builder** presents the FULL story as told by Jan Garcic himself.

"I was 40 this January (1984) from which I am not too happy. I live with my wife in the country in family house which we have built ourselves. I am modeling perhaps from age of 8. I was beginning as self-made designer. I was building only my own projects...A/2 gliders first. I was district champion in A/2; do not remember when (year). Later I was drawn by combustion engines. I started to fly U-control speed in 5CC class and Team Racing. I was 6th once in TR at our Nationals. These are my sports achievements.

"To designing of small engines I get due to my profession...I am tool and die maker working as fine machinist now. Around 1968, I started working on prototype and necessary jigs for manufacture. First was displacement 0.25 ccm. Later, from technology reasons it was changed to 0.3 ccm with name "John." (Jan's name translates to John in Europe's near-universal English language). *At the present I have three flying models on "Johns." Power assisted glider, power model, and delta plane (flying wing). All controlled by single-channel set (magnetic actuator). I want to install, successively, proportional R/C into them (still don't have proportional R/C set). I cannot send any photo...please, I do not want my address printed with the story of my engines."*

And that's Jan's story. He lives in a Communist-controlled nation...can send out usually two engines at a time...about 6 times each year. His engines have double ball bearings and the top of the con-

Continued on page 66

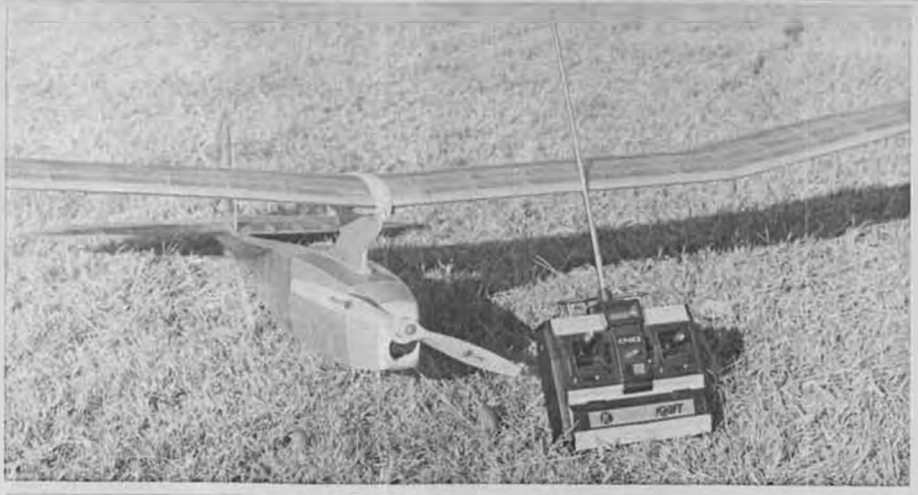
"John" engines rate among finest in the world. Less than a dozen are made annually.

Our author, left, and Bill Cooksey, from Gisborne, New Zealand, holding their newly-arrived "John" engines after 8-month effort.

Tuned pipe versions, new and faster. "John" Racer on left turns 18 K at max power. R/C version has variable compression control.

LEISURE'S ELECTRIC PLAYBOY

By DIXIE CUTRONE



For a relaxing, quiet, change of pace, try a LEISURE ELECTRIC powered PLAYBOY. The PLAYBOY is an 85% reduction of the original 1940 design, powered by a Leisure electric motor with a gear reduction of 2.5 to 1 and six-cell battery pack. You'll be amazed at how the unit turns an 11 x 7 prop. The other plus is the quiet operation. The only noise is the prop spinning.

The kit for the PLAYBOY comes to you very complete, with a rolled set of plans (no creases to iron out), a very well written set of instructions, a formed landing gear, a hardware package, and an excellent supply of selected balsawood. All parts for the wing and stab are sawed and sanded (no die crunching).

The construction of the PLAYBOY is very straightforward, and those of us who remember the old Free Flight days will have many memories brought back while building it. It's quite a bit different from the glass fuselages and foam wings that we are familiar with now. With the advantages of the cyano glues, the construction really moves at a rapid pace. The enclosed instructions take you through the entire construction.

Make sure everything is square while the building is proceeding. I made one deviation from the construction as presented on the plan. I made a removeable firewall that included the mount for the motor and rail that extended inside the fuselage to hold the radio system. This way I could remove the entire radio system from the front of the PLAYBOY. The motor batteries were mounted inside the fuselage and are not removeable with the radio system. While in the process of construction, make sure the pushrods are installed before covering. It makes the radio installation a lot easier.

Old and new combined. The Playboy dates back to the '30's, and electric is the new wave!

The full significance of electric power; Dixie launches the Playboy in a schoolyard!

The wing and stab are straightforward construction. You have your choice of regular dihedral or polyhedral in the wing configuration. I chose the poly because I think it makes the Playboy look better (more like the original). Hinges and horns added to stab and rudder are a slight deviation from a F/F, but in this situation, a must.

Covering and trim was done with transparent Solarfilm. Use some care in handling the structure while covering, it's a little more fragile than a quarter-scaler or a pattern bird.

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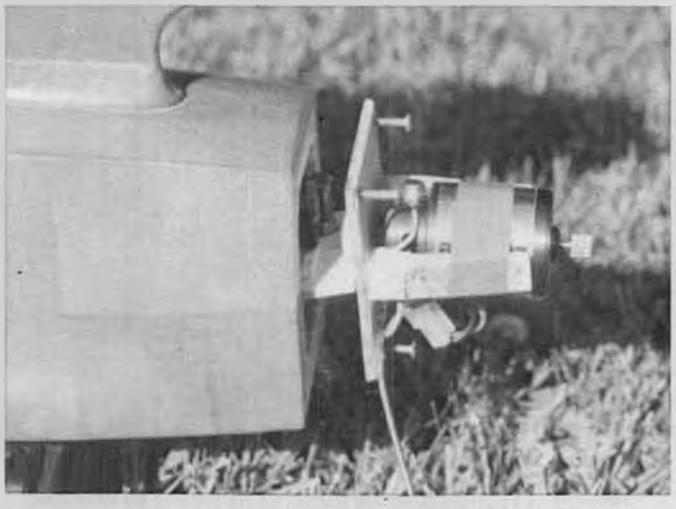
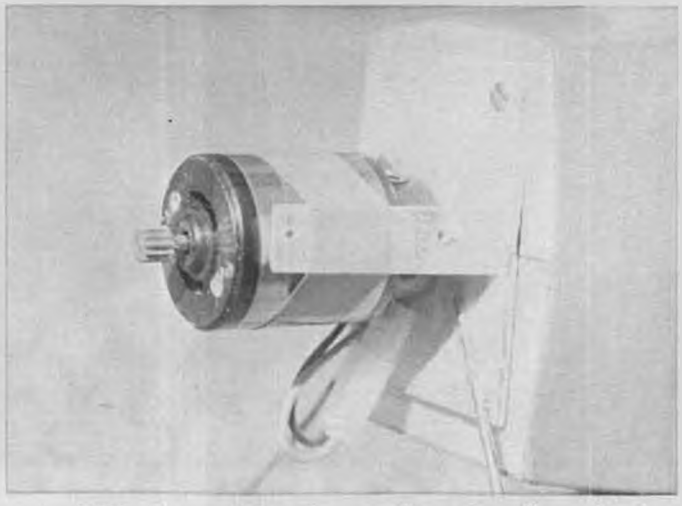
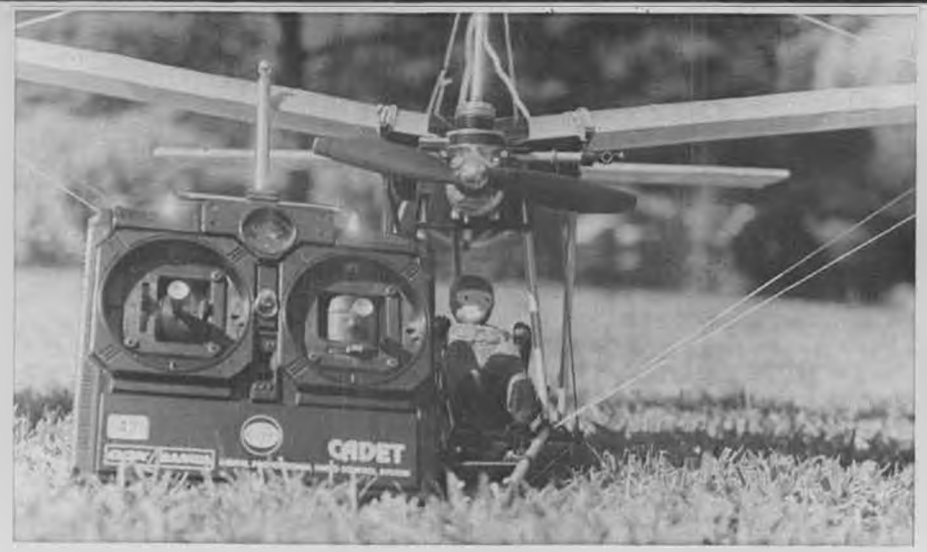


For easy access to the power unit, Dixie made the motor mount and battery tray as a single removeable unit, just like in the old days.



Try THIS with your 'infernal' combustion engine; it's taped to the motor mounts! Landing gear wired and epoxied to firewall.



COX SKY RALLY

By AL NOVOTNIK

OK, smarty, not so close! The Sky Rally making a tight turn for a deadstick landing.

Have you been thinking about getting something a little different to fly for a change? Why not try the all new Cox .049 Powered SKY RALLY Ultra-Light. It attracts a crowd whenever and wherever it's flown. A crowd pleaser at any field.

The kit comes very complete with everything you need except the radio system, fuel, and batteries. From the moment you open the colorful box until you get to the flying field you can tell every detail was well thought out. The instruction booklet is very complete and covers the entire assembly in easy-to-follow drawings. Every operation is explained in step-by-step form.

The time element for assembly is up to the builder. Some modelers are faster than others, but the average time is about three hours to assemble.

Starting the assembly with the fuselage, the fuselage structure as taken out of the box is practically finished. All there is to do is bolt the tail assembly in place with the hardware provided. The axles and wheels are secured in place and the Cox 049 engine bolted firmly in place. The radio compartment is a molded plastic box that's installed in an area below where the wing is located. Also located between the fuselage tubing is the seat for the pilot and the mounting for the battery box and switch harness.

The pilot is molded of styrofoam and must be glued together. After assembly, the pilot can be painted your favorite colors and fastened in place with the nut and bolt provided.

The wing and stab are molded foam with a hard surface. The only work that has to be done is to epoxy the two wing panels together and install the fasteners

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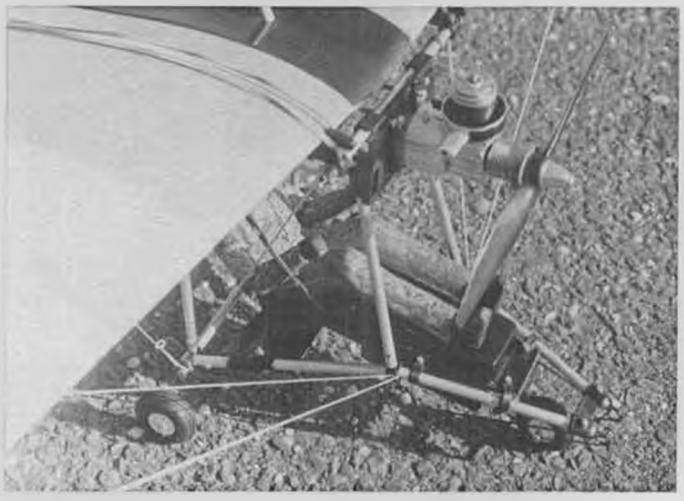
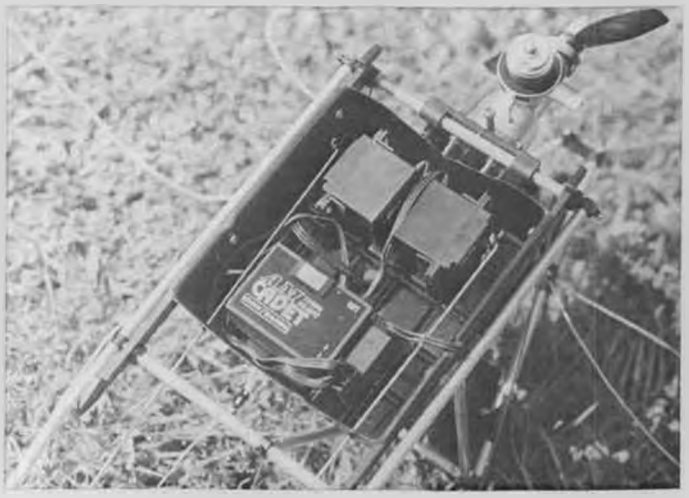
The Sky Rally takes about three hours to assemble. Scale is 1/8, giving a span of 43 inches. Power is the well-known Cox QRC .049 engine. Requires two-channel radio.



The Cox QRC engine is easily spring-started and runs quietly with the muffler ring properly adjusted.



Radio gear fits in tray covered by wing. Cox/Sanwa drops right into place, using double-stick foam tape provided in kit.

4 STROKER ENGINES

By DICK HANSON

Way back before WW-II, when I was but a lad in Montana, living on a small ranch, the model engine business was still quite small. One of the engines available then was the Marvin (see photo). The O.S. 90 is also shown to give you a little feeling for the tremendous advances in metallurgy and construction techniques which have developed in 45 years since the Marvin was designed.

The castings which make up the Marvin are no better than any novice machinist could accomplish over a basic hobby bench. The O.S. 90 on the other hand, has some very sophisticated castings as well as machining work which is the best I've seen. But the biggest difference in these two engines, is the horsepower developed by each. Judging from the construction of the Marvin, it probably turned a rather flat propellor around 6000 r.p.m. Just guessing. The fuel was gasoline and motor oil and as such didn't do much in the way of lubricating *and* cooling. However, not much cooling was required *because* not much power was developed.

The O.S. on the other hand, develops a healthy 1.3 b.h.p., according to the factory specs, and *that* for a four-cycle engine is quite good. Other .90 four-strokers approximate this power level, so what we are leading up to is true for most four-cycle model engines.

Please file away the following differences between two and four-stroke engines. Most two-stroke engines pump cold, raw fuel over the major parts of their innards when running. Most four-stroke engines only receive raw cold fuel in the carburetor...through an intake chamber, through a valve and thence to the combustion chamber...Period.

Full-scale four-stroke engines supply oil directly to the moving parts by various means, ie, drip, spray, pressure, wicking, capillary action, etc. The oiling in our example O.S. engine is accomplished from what is left on the cylinder wall and allowed to migrate into the remainder of the engine. Crude, but fairly effective if you don't abuse the engine.

If you follow the manufacturer's instructions you will have no problems *but* if you choose to experiment, here's what you can expect. Let's assume our engine is in perfect, broken in condition and we are running it with a 12 x 10 propellor at 10,000 r.p.m. (entirely possible and practical). An accurate tachometer and audio meter will show that you can change the needle valve setting without affecting r.p.m. much but the exhaust note will change a fair amount. Why?

Well, a good temperature indicating device (pyrometer) would show a temperature rise as we went from maximum *stable* r.p.m. to a slightly higher momentary reading. As the heat became excessive the engine would lose power and the exhaust note would become different. What *you* should know is that this condition can be destructive and is to be avoided with vigor!

Notice in the photo of the O.S., the needle valve assembly has been replaced with a standard O.S. mixture control. We use a small servo to operate it in the plane. This mixture control device can give you excellent feedback on fuel performance. I note a different mixture lever setting with each change in fuels I try. The best fuel I have tried has the maximum amount of nitro and oil the engine can consume while putting out the maximum sustained power.

Note I said the most oil and nitro, not the least oil and nitro...my reasoning is that the greater amount of liquid (oil) I can pass through the system, the more heat I can carry away and the more stable the engine temperature becomes.

OS 90 four-stroke with optional mixture control . . same one offered for two-cycle OS engines.

OS and Enya exhaust systems. They're pretty much interchangeable.

The desired mixture of oil and nitro varies from one engine design to another and therefore some experimentation should show which fuel works best for you. A mix of 15% castor oil and 15% nitro is generally quite safe, but 20% oil and no nitro will run in some engines. I like 15% oil and 25% nitro in the O.S. 90. The needle valve becomes very easy to adjust.

If your engine is always run at *reduced throttle settings,* lower quantities of oil can

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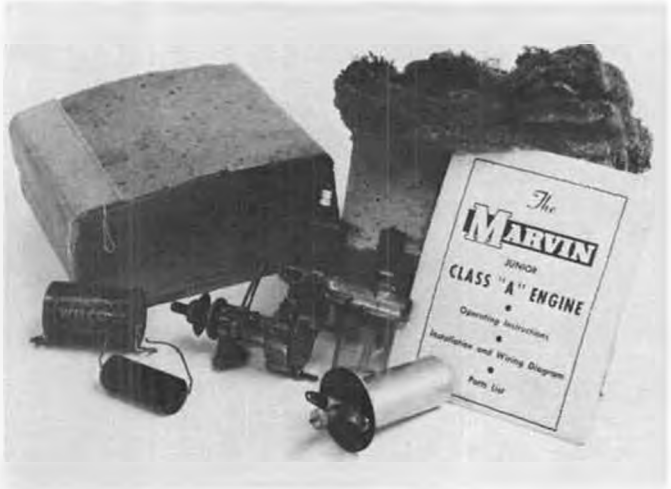


The author's Marvin engine, just barely used. Test run on the bench, and put away.

Packaging techniques have sure changed over the years. So has the quality of construction

R/C SOARING

By BILL FORREY

Scale entries at Valley Forge, Pennsylvania (l to r): Terry Luckenbach, Woody Blanchard, Joe Radoci, and Gene Shelkey. Gene was event director at the 1983 Westover AFB Nationals.

This month's column is going to be very interesting to a wide variety of R/C Soaring fun-atics. Why? Because it's a real variety of *stuff*, that's why. I just finished going through my briefcase and desk looking for soaring type material, and I came up with no less than 33 separate "column" subjects ranging from general information to interesting stories. Obviously I won't be able to go through all of these juicy tidbits in one column, but over the next several . . . I shall try!

R/C SOARING TECHNICAL PAPERS AND JOURNALS

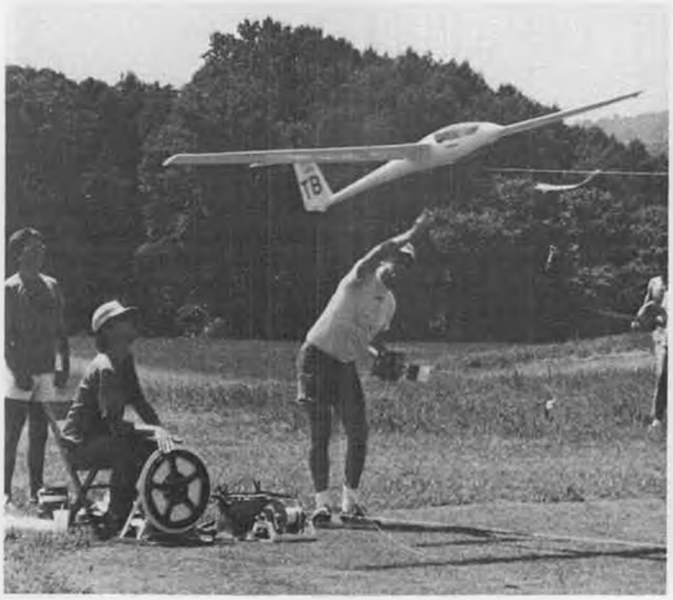
Most active thermal soaring types have either seen or heard about the Tidewater Model Soaring Society's "Soar Tech" journals, edited by Herk Stokely. I believe at this time there are a few "Number Two" journals still available (for $5.00 US, $10.00 foreign airmail) . . . "Number One" having been sold out for some time now . . . and there will soon be a "Number Three". Well, these are the finest sources of all kinds of technical soaring information available anywhere in the modeling world.

"Soar Tech" is a compilation of technical articles which have appeared in the TMSS newsletter over the years. Each one is a wealth of information in itself. Each journal covers dozens of articles . . . need I say more? Write to Herk Stokely, 1504 Horseshoe Circle, Virginia Beach, VA 23451, or phone (804) 428-8064 for further information.

Similar to the "Soar Tech" journal is the San Fernando Valley Silent Flyers (SFVSF) " Technical Anthology, 1978-1982". This half-inch thick *book* has reprinted articles from the "Slient Flyer" newsletter from the dates mentioned in the title. It was many months in the making because every story was retyped and re-edited. The finished product is very neat and easy to read. Jerry Krainock was chief motivator and editor in the production of this volume, Barbara Stearns was the typist, Dick Harty was the graphic artist, and Larry Pettyjohn was the printer . . . and several of the SFVSF club members were the authors. Subjects range from sailplane design, spar design, carbon fiber techniques, aerodynamics, glide polars of various gliders, how to measure glide paths with theodolites, dihedral effect, vacuum pump design, thick vs. thin airfoil debates, how to trim a rudder–elevator sailplane . . . and much, much more!!!

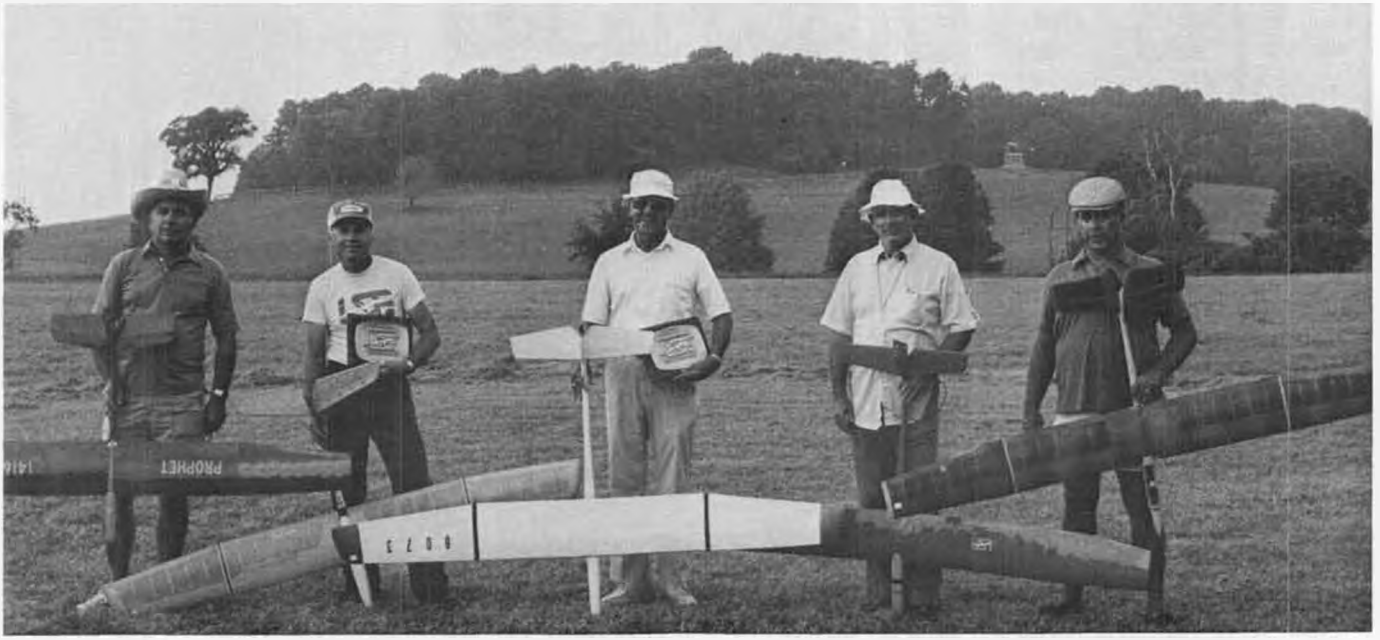
If you want *your* copy, you'd better hurry because somebody else is going to buy it if you don't! Once they're gone . . . well, it's not likely to be reprinted for some time. Mail $12.50 ($2.50 of which covers the postage and handling) to Jim Wichert, SFVSF Newsletter Editor, 1791 Glenview Avenue, Simi Valley, CA 93063. Make checks payable to Jim Wichert, SFVSF Editor, and don't forget the return address!

In a similar vein, Jim Gray, the *Model Airplane News* Soaring Editor, has produced several (approximately 13 by the time you read this) "RC Soaring Digest" newsletters. These small, tabloid publications are the cream of the crop of R/C



Terry Luckenbach gives the big heave ho to his winning ASW-20. Note Davey Systems retreiver rig for line return.

Billy Johnson, first place Junior. Less than 300 points out of first place overall. Look at those interesting merchandise prizes!



Two meter winners at Valley Forge (l to r): Ted Davey, Bill Meleske, Woody Blanchard, Skip Schow, and Bobby (Killer) Dolan. Historic Valley Forge in background, note monument.

Soaring newsletter articles from the US and Europe.

Write to Jim Gray, Editor and Publisher, "RC Soaring Digest," P.O. Box 186, 28 East Hill Rd., Peterborough, NH 03458, or call (603) 924-6759, and send in $15.00 ($22.50 foreign airmail) for 12 issues.

Like Jim Gray's tabloids, there is the monthly (sometimes bimonthly) "The White Sheet," a newsletter edited by the famous Sean Walbank of England. Sean has just recently joined the ranks of magazine contributing editors "over there" with his new column in *RC Model World* called "Silent Flight." "The White Sheet is a compilation of the finest newsletter articles from all over the world (many from the US). This publication averages 28 pages in length and is printed in a condensed type face to achieve maximum info per square inch. Sean has produced several "special" issues which fully explain certain special topics such as flying wings, a subject near and dear to Sean's heart . . . he's produced two such volumes. Also, Sean's "F3B Specials" are of the highest acclaim in the international soaring fraternity. These special issues typically go over 40 pages in length and contain dozens of three-views.

Now that Sean is doing the magazine column, I sure hope he continues with the "White Sheet." Currently, Sean is working on a second "F3B Special" so there is hope!

I wouldn't be a bit surprised to find out that Sean has back issues, although I don't know that for a fact. In case he does, I would *definitely buy them* if I were you, for they will become classics.

Write to Sean Walbank, Editor, 29, The Gardens, Acreman Street, SHERBORNE, Dorset, DT9 3PD England. A year's subscription in England runs five pounds (postage included), but this figure I'm sure would have to be inflated to $20 or more for US airmail. For subscriptions write to the treasurer of the White Sheet Radio Flying Club, Chris Morton, "Windwhistle", Stones Paddock, HOLCOMBE, Bath, Avon, England. (Heaven only knows how the English postal system manages to function with a system like this!)

Finally, there is a fifth source of excellent technical information: the "MARCS National Sailplane Symposium, November 1983." This volume contains many fine

Ready area in Valley Forge National Historical Park. Signal Seekers are celebrating their 25th anniversary this year, have good relationship with park officials. MB's Editor occasionally flew there in the '60's, visited the site in '82. It's beautiful!

articles and transcripts of discussions from the symposium. Subjects range from hand launch gliders, to winches, to kit manufacturing, to computer polars, to listing out several computer programs, to composite structures, to radio systems, and much more! You'll be pleased when you receive your copy . . . and you can order it by sending $7 (plus one more for first class mailing) to Al Scidmore, Editor, 5013 Dorsett Drive, Madison, WI 53711.

Now, if you *really* want to be informed . . . you'll have to buy all five! The information doesn't overlap, so you won't be buying the same information twice. Do it now before they are all sold out!

COMPUTER PROGRAMS AVAILABLE

Many of you have written in and requested the airfoil drawing program which was mentioned in this column quite a few months ago. This program, designed by Daryl T. Butcher for his Hewlett Packard computer, started a wave of interest in other sailplane design programs. Jay Thaddeus has just the thing for those "hackers" out there who have more (much more!) than a passing interest in aerodynamics and computer programming. (I would think this would narrow down the number of R/C modelers considerably!) This is *really* NOT for the average glider guider out there who owns a word processor!

Jay wrote me a very nice, three-page letter describing what he has to offer us in the way of computer software, but it contains far too much info to reprint here!!! Needless to say, most of us wouldn't have the hardware to take advantage of the programs anyway. For those who DO have microcomputers . . . you have two options: either write to me, send an SASE and one dollar and I will give you a copy of his three-page, info packed letter, or write to Jay and ask him what is available, both options will get you the info you need.

One last thing. Jay will provide the interested modeler/programmer with a floppy disk ready to run on his or her microcomputer that contains a very sophisticated design and analysis program. The language is BASIC and a 128k RAM machine with a BASIC interpreter/compiler will run the code.

Everything has its price, however, so for those VERY interested modeler/programmers, write to Jay Thaddeus, c/o Texas Aeronautical Computing Company, P.O. Box 218932, Houston, TX 77218. You won't be disappointed! If all you want is information though, be sure to send an SASE.

INTERNATIONAL CROSS COUNTRY SOARING

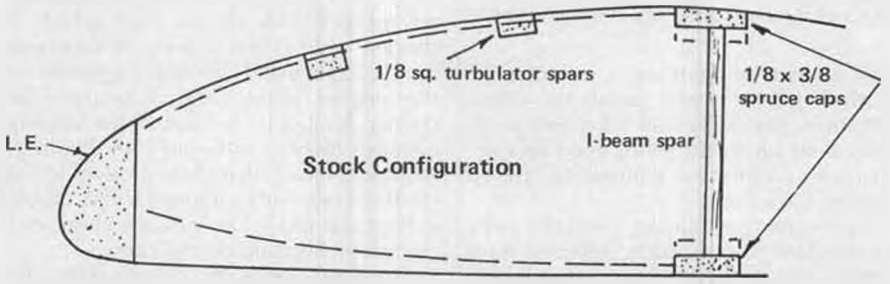
For those avid cross country fliers who would like to plan a vacation to a far off place and do a little friendly competing as well, listen up! The glider fliers of South Africa are inviting us Yanks to attend the first major international thermal cross country racing event in history. That's right, the guys who brought you the first F3B multi-task world championship back in 1977 are now going for another first! Notice has been given to the CIAM that there will be such an event on November 17 through the 23rd of 1985 near Bloemfontein, Republic of South Africa.

Andy Keil, one of the three F3B team members at the York WC in '83 from South Africa, wrote me a brief letter stating: "So far interest from the UK, Germany, and the Chicago area is very strong . . . so don't you crazy Californians let me down now!" I would add: "Hey, if Chicago can rank up there with the UK and the FRG, so can California!"

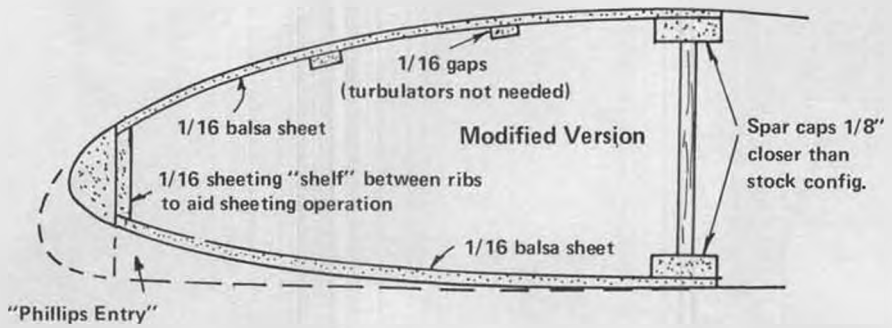
Any and all information may be had by writing to the organizers: Soaring Cross Country International, P.O. Box 283, BERGVLEI 2012, Republic of South Africa . . . or by sending me a business-sized, self-addressed envelope and one dollar for copying expenses for the four-page info packet that Andy sent me.

Start building the X-country racer now!

Tim Gold registered highest score of the meet. Beat the pros all weekend. Congratulations!



DASHED LINES SHOW MODIFICATIONS TO BE MADE TO STOCK RIBS FOR "PHILLIPS ENTRY" AND SHEETED LEADING EDGE.



DASHED LINES SHOW STOCK CONFIGURATION. SEE TEXT FOR EXPLANATION.

VALLEY FORGE
(PENNSYLVANIA)
SIGNAL SEEKERS

1984 VALLEY FORGE LSF REGIONAL

The following report was received about 45 days ago by this writer. I felt that there would be sufficient interest out there even though it is a little bit dated, so here it is! Jeff Troy was the CD for the affair, as well as the reporter and author of what follows.

"Planning, preparation, good capable personnel, and a little help from the weather man are the important things in running a first class sailplane meet. That's where we began, but by the time things were underway, those were just the beginning. We had a lot of help!

"On August 18 and 19, the Valley Forge Signal Seekers played host to 108 entries in two days of radio controlled sailplane flying at its best. The meet was a combined League of Silent Flight Regional and Valley Forge Second Annual Sailplane Contest. Unlimited class and Two Meter class in both Sportsman and Expert cate-

Continued on page 90

GORHAM MODEL PRODUCTS
COBRA

By RAY HOSTETLER

6. Ray Hostetler maneuvers the Cobra during a fly-in at Merced, Calif. An excellent site, but it was quite windy on this occasion. Made for some good full down autos, however! See text.

In the last few months I've had the chance to complete and fly Gorham's new Cobra, the subject for this month's review. While in some respects it is a "baby Competitor," it does have some differences in design that are subtle but significant improvements. In the end, the Cobra ends up with a personality all of its own.

PACKAGING

The Cobra comes neatly packaged in a 30 x 11 x 4-1/2 inch box. Interior items are neatly bagged and numbered. Other loose items are wrapped with protective white paper. The kit features a very nice "sticky" decal sheet, which really helps when it comes time for the finishing touches.

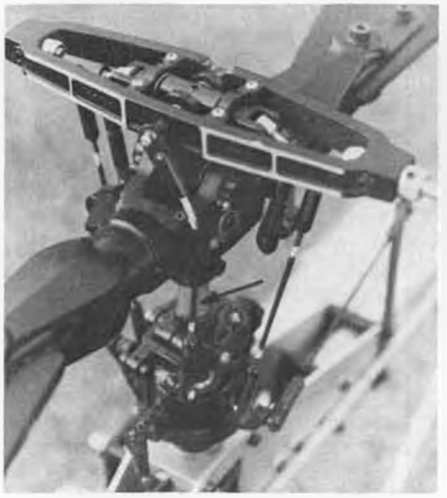
INSTRUCTIONS

These are, on the whole, very thorough. They are basically an adaptation of the "new" Competitor instructions, with changes as appropriate. There are only a few points that need clarification, and I'll do that as we go along.

MAIN FRAMES AND DRIVE TRAIN

The main frames are basically designed like the Competitor's, except that they are smaller, lighter, and drilled more accurately. This really helps with drive train gear meshes.

The frames are not anodized, but come moderately "brushed" or "textured." The application of aluminum polish will not shine up the main frame so either let them go as is or paint them. I elected to let them go as is and polish the other aluminum parts. The tail tube and skids really shine up nicely, giving good appearance without the time consuming task of painting everything.

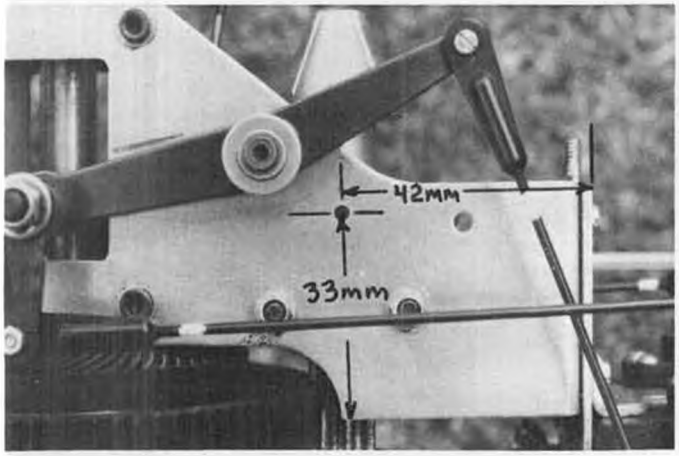


4. Hirobo rotor head used on Cobra is state-of the-art. Author runs Hiller pushrod around yoke, not through center of yoke. See arrow.

3. Groove needed in top bearing block (arrow) for proper pushrod clearance. Canopy cut-out and grommet also visible.

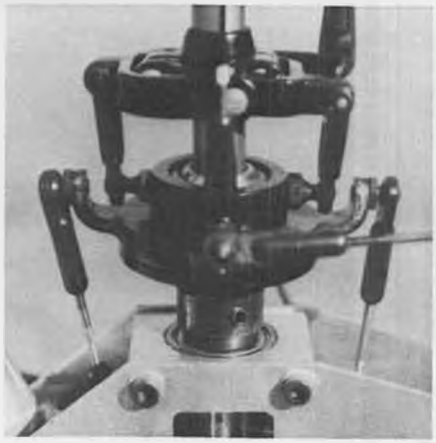
The engine is mounted vertically with the standard clutch/clutch bell/cone start system. An improvement in design is evident here because the clutch shaft only runs through one bearing (instead of two as in the Competitor). This gives several advantages: 1) A clutch shaft which is shorter, and has less chance for excessive run-out, 2) It makes vertical alignment of the engine easier, and 3) Lessens the chance for lateral tension in the bearing because there is only one. See Photo 2. Also note how I filed some grooves in the starting cone with a triangular file, visible in Photos 2 and 3. This virtually eliminates the starter slipping on the cone.

The gear ratios are identical to the

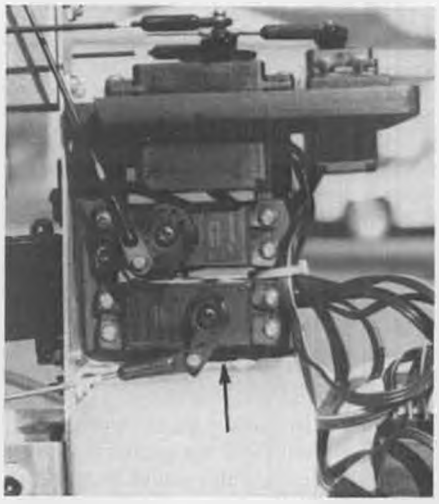


2. Dimensions locate access hole to get at starting cone set-screws. Pushrods marked with 'white out' to show thread length left.

9. Add-on switch mount is shown screwed to front frame. Use pattern on next page if you wish to make one for your installation.



10. Excellent swashplate comes standard with Cobra. All ball joints are "in line" for perfect transfer of control effort from sevos to head.



12. Use care when trimming vertical portions of plywood servo tray. Very little clearance between lower servo and tank (arrow).

Competitor because the drive system is exactly the same in each bird. An engine speed of 12,000 rpm will give a main rotor speed of 1,395 and a tail rotor speed of 5,580. Excellent.

I want to note here that the whole main frame and drive assembly is so much easier to bolt together because there are nylon bushed lock nuts supplied with the Cobra . . . No need to lock-tite every bolt.

In last month's Chopper Chatter, I detailed tail rotor drive alignment, hopefully you have that issue to refer back to.

COOLING

Hirobo has come out with a beautiful two-piece cooling shroud which GMP is

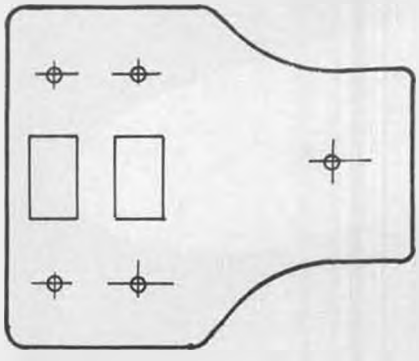


Fig. 2. Full-size template for switch and charge plug mount.

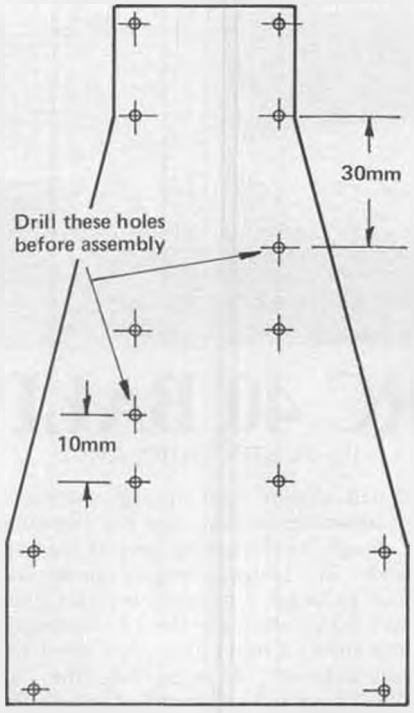
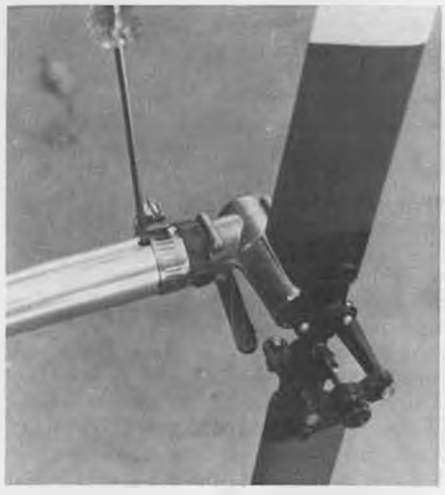


Fig. 1. Front view of front frame plate, shows added holes for cooling shroud bracket and switch mount.



11. Allen wrench inserted into coupler's set-screw, through filed-out top groove holds tail rotor shaft in place as rotor hub is turned.

using on the Cobra as well as the Competitor. There is a metal "L" bracket in front which attaches the shroud to the front frame plate, and can be used with no modification on the Competitor other than drilling a hole in the front plate. With the Cobra, the "L" bracket must also be cut down and re-drilled to allow its use. This is a little tedious, but the new cooling shroud is worth it. Don't use the wood block up front to hold the shroud in place! See Figure 1 for hole dimensions.

CANOPY

The canopy is molded out of fairly thick plastic and can be trimmed to size using scissors or tin snips for the rough cuts. The plastic is nice and clear, and can be tinted with Rit dye if desired. Paper templates are furnished to locate the top hole in the canopy, as well as the cut-out portions around the starter cone. A moto-tool works well for bringing the canopy

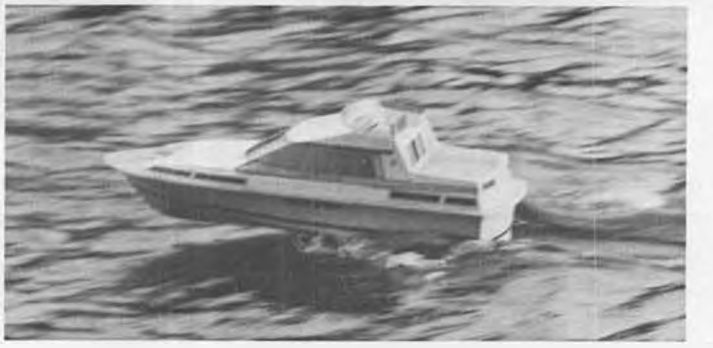
7&8. Bob Gorham flying the Cobra/Jet Ranger at Merced. Bob won FAI team trials with this rig. GMP heli's placed 1, 2, &4 at trials!

flanges down to final size. Gluing the canopy halves with Hot Stuff works well. I use small black office clamps to hold the halves together. Which reminds me, it is easier to Hot Stuff the canopy halves if one flange is larger than the other. Cut one flange to one-eighth of an inch, the other to one-quarter of an inch. Then, as the Hot Stuff is applied to the larger flange, it runs neatly down into the seam. Often, when the seams are identical, it is difficult to get the Hot Stuff into the seam, which can leave ugly drip marks on your beautiful canopy. After the cyanoacrylate dries, simply grind the larger seam down to meet the smaller one.

I painted my canopy with Pactra Formula U. Lightly sand the canopy with 600 sandpaper before painting, and wash it with warm soapy water. Using rougher sandpaper will leave ugly fuzz marks all over the canopy after it is painted, so use only 600 paper. Lightly sanding the canopy is not mandatory. If you wish, you can wash it clean and paint without sanding.

Continued on page 83

5. Modified 'stinger' is 1/8" brass tube, screwed to gearbox collar at rear, runs through tube epoxied to tail tube. Hot-Stuffed in place.



MRC 40 BALTIC

By JERRY DUNLAP

I first saw the "40 Baltic" on the back cover of the November issue of **Model Builder.** Having just sent in an article for the January issue dealing with electric model boating, I thought to myself, "This looks like an ideal follow-up for the column I just wrote."

A quick call to our revered editor requesting his assistance in obtaining the "40 Baltic" turned out even better than I could have imagined. Seems like the folks at Model Rectifier Corporation had already sent him a boat for a review. "Editor Bill" was planning to do the review, but relented to lack of time and my request. Apparently the sound of a grown man groveling over the telephone persuaded our editor to send the boat up the coast about a thousand miles.

After agreeing to send the "40 Baltic," Bill inquired if I'd be interested in trying out the new Futaba Magnum Junior in the boat. Now I really couldn't believe my good fortune. You can best believe there was no hesitation on my part agreeing to use the Magnum series as the radio control unit.

The boat and radio arrived a couple of days after my rewarding phone call. The ad for the "40 Baltic" claimed a ready-to-run time of something like four hours from box to beach. I decided to see if their time projection was accurate. On occasions during the football season, I take time to watch a complete Seattle Seahawks football game. A typical professional football game takes three to three and one-half hours to complete.

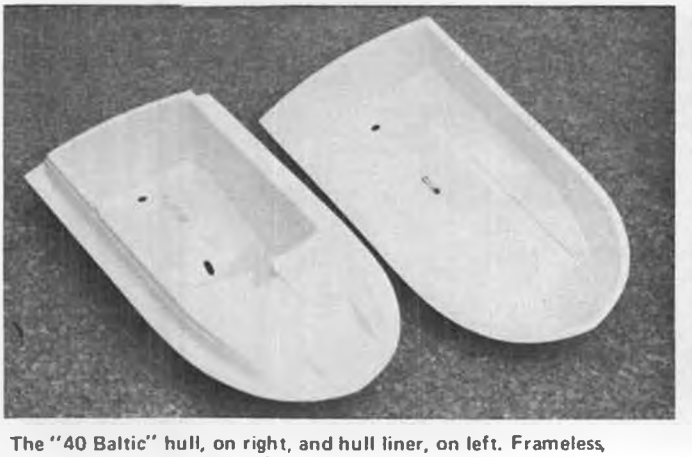
I had already read through the excellent assembly booklet and put the radio on charge. As the first quarter of the Seahawks, San Diego Chargers game was about to begin, I grabbed my Hot Stuff Super T, Hot Shot, and box of "40 Baltic" components. I won't give you a down-by-down account of assembling the "40 Baltic." I can tell you that by the time the Seahawks had disposed of the Chargers, I had everything done on the boat except the installation of the deck and cabin fittings. With the exception of the fittings, the boat was ready to go. When the game ended I packed up my recently completed model and headed for a nearby lake to give it a try.

Before relating my experiences running the "40 Baltic," let me provide you with more background information about this very nice looking model boat. The Storebro Royal Cruiser 40 Baltic is a 1/20 scale model of a boat made by the Storebro Bruks AB company of Sweden. Storebro Bruks AB is a famous manufacturer of boats known all over the world for their superb finish, elegant design and seaworthiness. I must admit I've never heard of this full-size boating manufacturer, but if the real boats are like the Acoms' model, I'm sure they really are beautiful boats.

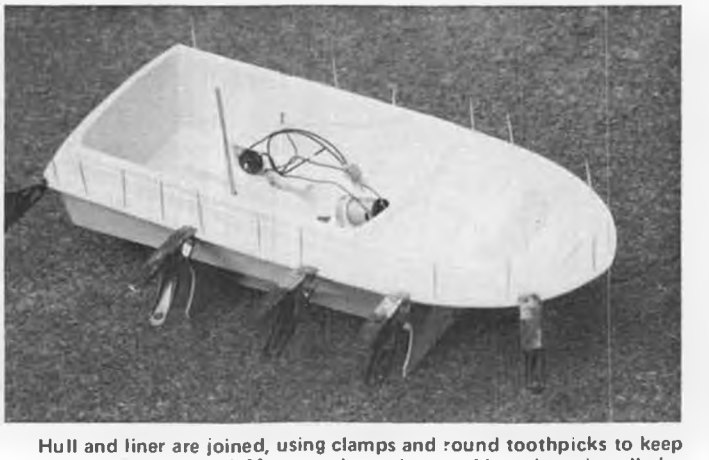
The Acoms "40 Baltic" has a length of 24-1/2 inches, a beam of 10-1/4 inches, and a height of 9 inches. Including radio equipment and motor Ni-Cd battery, the operational weight is a little over 2-1/2 pounds. The motor provided with the kit is a Mabuchi RS-380 that is coupled to a gear box using 1.3 reduction. The hull is molded plastic, featuring monocoque design for frameless construction. All the hull, deck, cabin, and fitting parts are accurately formed. The quality of the kit is excellent.

I must admit I had some reservations about building a plastic model. The truth of the matter is I was never able to make plastic models without making a big mess of all those little parts. Well, I was pleasantly surprised how painless the assembling of the "40 Baltic" turned out to be. The construction booklet provided with the boat is exceptionally well done. Assembling the boat is quick and easy with the use of instant glues. Although it didn't show it in the construction booklet, I found it helpful to use round toothpicks stuck through the deck fittings holes to keep the hull and hull liner aligned while gluing the two pieces together. Other than that suggestion, I simply followed the instructions.

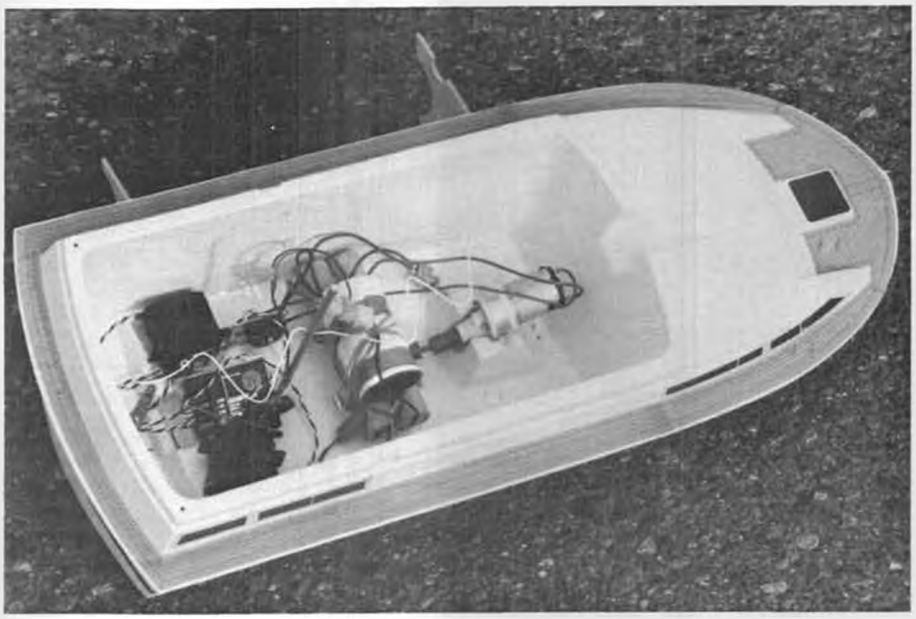
An area that took considerable time was the application of the hull and deck decals. These peel-and-stick decals are what gives the detail to this model. I simply stuck them on the boat without using the alternative method described in the instruction booklet. In my haste to get the boat out the door, I encountered some problems with airbubbles under some of the larger decals. I would recommend using the warm water and neutral synthetic detergent method described in the instructions to prevent airbubbles under the



The "40 Baltic" hull, on right, and hull liner, on left. Frameless, monocoque design ensures fast, easy construction.



Hull and liner are joined, using clamps and round toothpicks to keep the hull parts aligned. Motor and speed control have been installed.



Installation of motor/gearbox and radio equipment. Futaba Junior radio system used. Lots of room for equipment. Not as easy to do while watching a TV football game, but it works!

Brianne Dudley takes the Baltic for a spin, under close supervision by his dad, Tom, past commodore of Puget Sound Model Boat Club.

decals.

Installing the motor/gearbox was simply a matter of screwing the unit into the molded motor mount. The universal system provided for attaching the prop shaft to the gearbox makes propshaft alignment to the gearbox easy to accomplish. The rudder mechanism is bolted through the hull. I did use a little white bathtub sealer around the area where the rudder shaft log exits the hull. All holes needed for the installation of hardware are predrilled. And all the hardware needed, including a simple forward/neutral/reverse speed control, is included with the "40 Baltic" kit.

Installing the Futaba Magnum Junior was a cinch. The servos are affixed to the inside of the hull through the use of doublestick tape. All the linkages are direct. The receiver antenna should be taped around the top edge of the motor/radio compartment. The receiver on/off switch can be mounted to the back of the cabin decking. It would be a good idea to stick the receiver in a sandwich bag.

RUNNING THE "40 BALTIC"

With the conclusion of the football game, I was ready to try out the "40 Baltic." I was especially interested to see what kind of performance the boat would have using a 1:3 reduction gearbox. My daughter wanted to try running the boat and invited a friend to join us for the first running. My daughter, Denise, has taken a much greater interest in electric boats than in my gas powered hulls.

I have the great fortune of having a lake about a half mile from my house. Because it is surrounded by homes, I don't run my gas powered boats on this lake. A nice thing about electric boats . . . there isn't a problem with noise. The "40 Baltic" was set in the water, given a slight push to get it away from the beach, and then the throttle trigger on the Magnum wheel transmitter was pulled. The "40 Baltic" immediately jumped up on a plane and skimmed across the lake. I would estimate the speed between 10 to 12 mph, but it was really impressive looking. The handling characteristics of the boat proved just as excellent as the quality of the kit. The boat turns equally well to both the left and right. Depending on how much rudder you want to use, the boat will almost turn in its own length. Such a sharp turn, however, isn't scale appearing.

I passed the transmitter to Denise and she experienced no difficulty running the "40 Baltic" through circles, figure 8s, write your name, and just running back and forth. She then gave the transmitter to her friend who had never operated a remote control model before. This young lady steered the boat around like she had been doing so for years. After about six minutes, the six-cell pack for the motor ran down. The "40 Baltic" was brought back to the beach and I knew this was going to be a special model.

In the short time I have had the "40 Baltic," I would imagine it has been run by fifty or more individuals. It is especially popular among young people. The pistol-grip Magnum transmitter is very easy to use for the person with no previous experience with radio control. Experienced model boaters are impressed with the performance and handling of the boat.

There is one item that I am going to obtain for the boat and this is a variable speed control. The forward/neutral/

Continued on page 94

Full reverse shows the value of possibly adding a variable speed control. Stern is really pushing a wall of water!

It sure goes nice in fast forward! Speed is estimated at 10 to 12 mph, which is moving right along as compared to most electric boats.

Karen Pelgrims demonstrates at the Kitchener Scale Rally that her 62 lbs. is no match for Peter Baabs' 45% size Aeronca 7AC Champ. A Jim Crawford design, the large model weighs only 53 lbs., flys on a 10 HP Chrysler outboard engine.

Simply Scale

By CLIFF TACIE

KITCHENER

• Once again I had the opportunity to attend the Scale Rally sponsored by the Kitchener-Waterloo Flying Dutchmen. Traditionally a two-day event, this year's rally was the 15th annual, and was held at the scenic Kiwanis Centennial Park, Kitchener, Ontario, Canada.

A short two-three hour drive from the U.S., be it Buffalo or Detroit, the rally continues to draw strongly from the U.S. ranks. It's the perfect opportunity to enjoy a combination of the beautiful scale models and crisp autumn scenery of central Ontario.

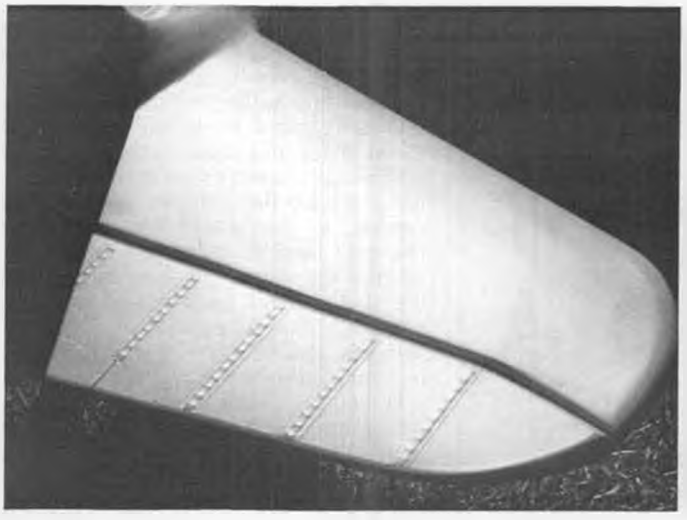
As usual, the number of models in attendance was between 100-200. I plead guilty, I don't know the exact number, as I was only able to be there on Saturday. Noticeable was the continuing trend toward this becoming a "Giant Scale" rally. There were very few "normal" size models to be seen; a shame, as the quality of the smaller models usually seen at this event was generally very high. That is not to say that the quality of this year's models was lacking! Hardly, with the presence of such notables as Bob Nelitz, Bob Wischer, Steve Gray, Graham Ireland, and Jack Swift, all former members of World Scale Teams. It's encouraging and enlightening to see that these well known names in scale modeling are not interested only in competition...they like to have fun also!

Bob Nelitz was out displaying and flying his new 1/3-scale Clip Wing Taylorcraft. When I asked Al Novotnik if Bob's Taylorcraft was as good as his now famous Cub, Al said only one word..."*Better!*" Hard to believe, as the Cub looked perfect, but Al was right. Bob's Taylorcraft seems exact in every sense of the word. Even the finish is scale...butyrate dope over Ceconite. At 30 lbs, the Quadra 50 pulls it around in the realistic, aerobatic manner of the prototype. It's encouraging to see someone of the status of Bob Nelitz building models of the simple aircraft he enjoys, not some complicated subject he would be forced to build to be competitive in today's FAI events. Take a lesson, Simple Scalers, build what you like to maximize your enjoyment.

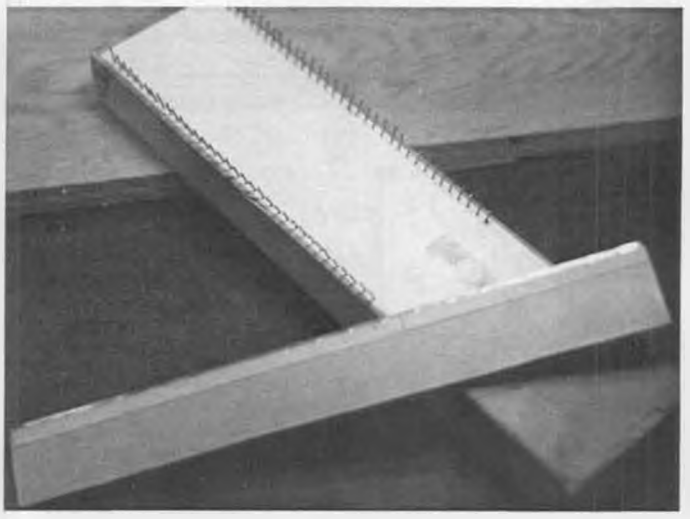
Another "simple" model, but one which is precision scale in all aspects, was Bob

Makes you want to jump in and go for a ride! It's Bob Nelitz's one-third scale Clip Wing Taylorcraft, seen at Kitchener.

The elder statesman of R/C scale, Bob Wischer, with his 1/4-scale Aeronca "K", a winner at the Reno '84 Nats.



Rib stitch and pinking tape effect as created by Tom Weemes, and explained in text. Easy if you know how!



Tools of the trade for rib stitch effect: a piece of 2 x 4, wire brads, part of a waxed paper container, and sandpaper. See text.

More simulated rib stitching and pinking tape, on Tom Weemes' 1/5-scale PT-19.

Wischer's Aeronca Model K, a model of the plane Bob and Dolly once had the pleasure of owning. At 1/4-scale, Bob has expressed the amount of pleasure he has derived from flying this model. And even though it may seem "simple," it can still be considered competitive...Bob won the Giant Scale event at the 1984 Reno Nats with the "K"!

If you haven't yet put Kitchener on your list of "must" attend events, I would highly recommend it. Traditionally held the second weekend in September, if you live in the Midwest or the East, plan on it for 1985 and I'll see you there!

RIB STITCHING

For those of us who enjoy building scale models of fabric covered aircraft, the search for the most perfect, *simple* method of simulating rib stitching and pinked tape is never ending. There have been many different articles written on the subject, and yes, I also have my own method. However, while at the 1984 U.S. Scale Masters in Kansas City, I had an enjoyable conversation with Tommie Weemes, of Hereford, Texas. Tommie was telling me how he went about the task of "rib stitching" his well executed PT-19. When I asked him if he would mind writing up his technique and sending it to me, he said "Okay, I will!", and sure enough, several weeks later, there it was in my mail box!

I'm going to share Tommie's article with you first, and then follow up with some suggestions and techniques of my own.

"Dear Cliff,

"I am enclosing a sample, with directions and pictures, of my method of simulating rib stitching. This is a modification of someone elses' method that appeared in another publication. (I believe it was Steve Sauger in M.A.N. cjt)

"Start with a piece of scrap 2x4 at least a little longer than the chord of your wing. To simplify making the jig, glue 1/8 inch grid graph paper on the 2x4, using white glue. Why graph paper? I'm lazy, the graph paper is already marked in 1/8 inch increments, and the separation between stitches on my 1/5th scale PT-19 is 1/4 inch. To complete the jig, drive wire brads across from each other and 1/4 inch apart (every-other grid line) for the length of the 2x4 and graph paper. We have now constructed the basic jig that we'll use to manufacture our 'stitches'.

"To make a set of stitches, lay a piece of 1/8 inch plywood over the jig and between the rows of brads, then cover it with a layer of waxed paper, followed by an equal size layer of graph paper. This graph paper will end up being our reinforcing strip under the stitches, as on the full scale aircraft. Using white thread of an appropriate gauge, tie it to the first brad, and then weave it between the brads on the jig so that it goes across the jig every 1/4 inch, securing it at the other end of the jig with a drop of C/A. With the graph paper grid lined up beneath the thread, glue the thread to the paper using thin C/A (Now you know the reason for the waxed paper!). Once cured, slice the thread loose from the brads and remove the C/A soaked graph paper and thread from the jig.

"The 'reinforcing strips' with 'stitches' attached can now be sliced from the sheet. At 1/5th scale, my rib stitching is 1/8 inch wide, so using a sharp #11 blade, I simply lined up my straightedge on the lengthwise grid lines and sliced up 1/8 inch wide rib stitches the length of my wing chord. These rib stitch strips can now be glued on your already covered wing at the rib positions, using RC-56 glue. After the glue has dried, gentle strokes in one direction with 400-grit wet-or-dry sandpaper will remove the sharp edges.

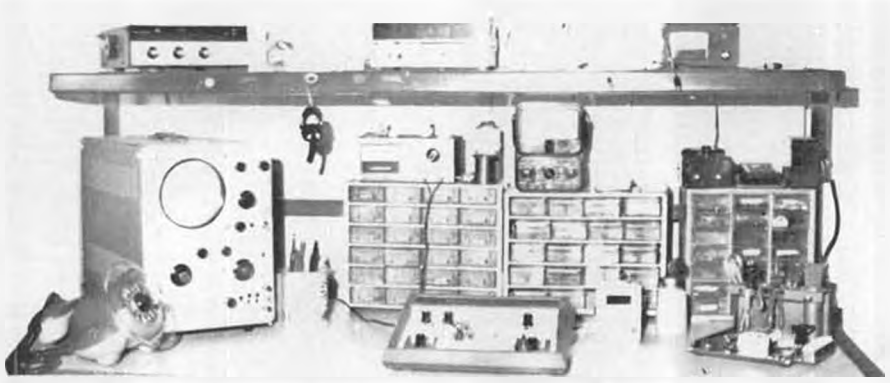
"Once the rib stitching is glued on the surface, it must be covered with 'pinked' tape as on the prototype. To make realistic pinked tape, borrow your pit crew's (otherwise known as the wife's) wax-paper container. Explain to her that she'll still be able to cut the waxed paper with a butcher knife even after you have removed the serrated metal cutting edge, along with about an inch of the cardboard container! Now glue a hardwood reinforcement along the top of the cutter bar, about a 1/4 inch from the serrated edge. On the bottom of this wondrous tool, place small 1/4-inch wide strips of sticky back sandpaper to keep our cutter bar firmly in place while in use. Strips of 'pinked' tape can now be made by laying the serrated cutter on top of graph paper at 3/8-inch intervals (1/5th scale), holding firmly and pulling the paper up against the cutter edge.

"These strips of 3/8-inch wide 'pinked' tape are now applied over the rows of stitches by soaking the strips in water, then, with nitrate dope (ONLY if you haven't already applied butyrate dope to your covering! Use ONLY compatible paints!) *dope the tape in place, smoothing by rolling your thumb over it to accentuate the rib stitching underneath."*

Tom's methods are similar to my own, and as you can see by the photos, the results are well worth the little extra effort.

Rather than make "strips" of thread stitches as Tommie does, I've usually just

Continued on page 66



Electronics Corner

By ELOY MAREZ

GLOW PLUG DRIVER, O.M.T.

We hear from Down Under this month. Howard Jones, from Langford, Perth, Western Australia, writes:

"In past months, you have had in your column mention of the LM-338K Voltage Regulator for use as a glow driver. When the regulator first appeared in Australia, one of our Gung Ho combat flyers, Gary Turna, teamed up with an electronics engineer in Queensland and produced the design shown. I have built three of these now for myself and friends and all have functioned trouble free. The oldest is now about four years old and would have been used for combat flameups over about forty weekends each year. So it's reliable. Mine and the other one is used for sports flyers (the starting thereof). They are usually borrowed a lot . . . then we are social fliers, aren't we?

"The beauty of the unit is that the output voltage is maintained within plus or minus one percent of the calculated voltage according to: Voltage (Out) = 1.25 (1 + R2/R1). I use 1% resistors for R1, 2, and 3 to assure this (Cost 6 cents Australian currency each). I haven't blown a glowplug in two years of sports flying using this unit. The meter is a small 250 micro-amp full scale deflection signal strength meter. We scratch off the old markings and mark 1, 2, 3, 4, 5. This gives us good deflections to indicate wet, dry, or stuffed plugs or battery (or the unit is switched off). Two or three amps are usual. If the memory is accurate (Use is instinctive, I'm not an elephant!), two amps is dry, three to three-and-a-half amps normal, five amps hydraulic lock.

"I assemble the unit in a small zippy box 28 × 54 × 83 mm. This has an aluminum front, plastic internally fluted case. I slot the bottom and use a 50-cent Woolie's watch band for wrist starter use (combat). The general layout is sketched at the start of the letter. The terminals are Tandy article 274.661 (The best suited!). For connections to the glow plug, household electrical wire is used. Bare about 1/2 inch of wire. Pass down the hole in the end and out the little hole in the side of the metal section of the post, and around the post. Screw the plastic screw clamp down. This is virtually backwards from the normal way of using it. By using the post with the insulation down through it, the fatigue of the wire end is completely eliminated and the unit looks more professional. My idea, I think. The engineer's name (I think he is an engineer) is Rodney Rush. The design was published in the Australian magazine Airborne, *so you won't be crucified if you mention the editor Merv Buckmaster in the credits. He's a nice chap!"*

Before any further comments, a translation is in order! Tandy and Woolie's are Radio Shack and Woolworths, respectively. The part numbers mentioned for the terminals are the same in my 1985 R.S. catalog, so you should be able to use Howard's (and his friend's) ideas for connecting the wires. The idea of relieving the stress at this point where the wires constantly flex is a good one, and will someday save you from a no-start caused by a broken wire.

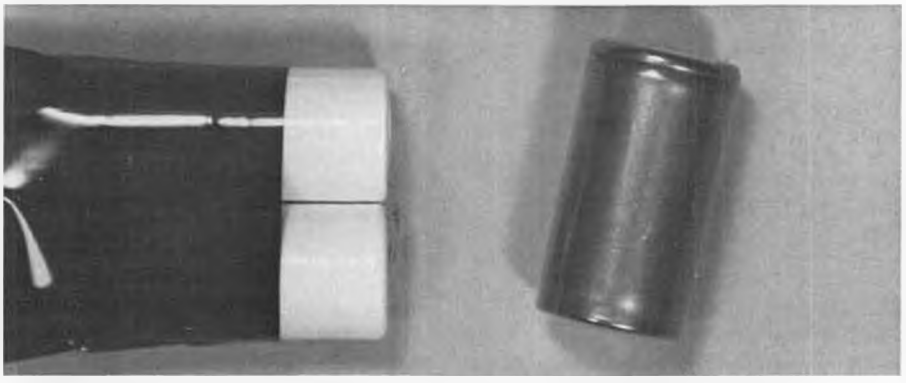
In general, the basic circuit and the wrist-mounted unit for fast race starts are both good. In the latter case, I'd make sure that some sort of belt mounted battery pack is used in conjunction with the Aussie driver. I recommend Ni-Cds, as they have the greatest amount of energy for size and weight, and even a pack of 500 mil cells will provide enough for the day's activities before recharging is necessary. For sport flying, as Howard mentions, don't hesitate to use cells which have outlived their useful life in R/C equipment, but which still have some capacity. Of course, for serious competition, you'll need the best of everything, including 100% dependable battery power.

As far as the circuit is concerned, it should not be difficult to duplicate, with the exception of the metering circuit. The meter mentioned will be a problem to locate for most of us, but a substitute can be used with the same results. The ads in the electronic magazines are a good source of such items; anything from 50 to 500 micro-amps should work. Substituting a 5K trimpot for R3 would allow setting the meter reading to a usable level. Like Howard, I am not an elephant, nor have that type of memory, so in cases like this, I always like to set the reading at an easy-to-remember level, such as mid-scale for normal; anything other than that is an indication of something not quite right.

Howard recommends the use of the smallest switch available that is capable of handling five amps at twelve volts. Similarly, the smallest heat sink suitable for the TO-3 case of the LM-338 will be adequate to carry off the small amount of heat generated during the short period that the unit is in use.

Using the formula given, it will be possible to adjust the ouput voltage for

The Airtronics Championship Series CS7P transmitter, available with various plug-in mixer modules. See text for more info.



Very thin heat-shrinkable tubing, useful for protecting and insulating Ni-Cd batteries, as well as other electronic parts. See text for source.

other uses, such as to two volts for the plugs that require that voltage, and to three volts for "flameups" of two plugs in series on the twins. Being relatively inexpensive, this would also be a good backup system to have in the tool box in case that sophisticated power panel gives up the ghost.

Oh, I almost forgot to mention the name of the editor of *Airborne* magazine: Merv Buckmaster!

HE WANTS TO WHAT?

Old Timers will certainly remember the name of Len Purdy, the grandaddy of ARF's. And the name of his company, Lanier Products. Anyway, we heard from Len, who is retired and enjoying life in Georgia. He writes:

"I sold Lanier Ready-To-Fly several years ago and retired . . . I needed more time to play with my toys.

I have become interested in R/C scale boats. I need some radio help in connection with my new boat, a 58-inch long (1/4" to 1') scratch built (from ABS of course) Robert E. Lee paddle-wheel.

One feature of the boat is the addition of a two-octave keyboard to the transmitter, permitting playing a tune by remote control.

1. My problem is a way of multiplying the signals of the digital channels.

2. I think a solution would have wide appeal with R/C boaters.

3. I have tried to locate a method of converting a six-channel set to eighteen channels. No luck!

4. I have experimented with using three transmitters on (channels) 62, 74, and 84 . . . they interfere some but it appears they would work OK.

5. I need some kind of transistor switch/gate to turn the toy organ off/on.

6. A mechanical switch made from a servo would do, but seems to me that some electronic solution is possible.

Any help you'd like to give, I'd appreciate."

Don't ever let it be said that we've done it all, or that modeler's lack ingenuity. Can't you just picture this big paddle-wheeler coming around the bend of the Chattahoochee River, playing *"Dixie,"* or*"Swanee River."* Love it!

As for the control of the organ, that is another story. Technically it is readily possible. Using one of the tone generator and frequency-to-voltage ICs at the transmitter end could provide the necessary encoding, while a motor control type of circuit at the receiving end would give us the start of the necessary decoding, probably followed by a driver and optocouplers. I'm afraid I don't have the exact circuit information available, but it has been done. The Europeans have a number of different R/C systems available which have just this type of capability, with the addition of modules at both the transmitting and receiving ends. Better news is that there is one such system available in this country.

I have not seen one of these systems, and actually have no knowledge of it except that obtained from an advertisement. The product is called a "KYS Keykoder," and is available from Vantec, 15445 Ventura Blvd., Suite 10-281, Sherman Oaks, CA 91413. It consists of a telephone type keyboard which is added to the transmitter and a companion decoder which is plugged into one of the receiver channels. It is described as "adds 12 on-off channels to your R/C set. Control bells, lights, and motors directly without servos and switches. Perfect for submarines and robots."

The advertisement shows the system mounted on a Futaba transmitter, though apparently it can be used with other types. A completely modified and ready to float R/C system is also available from Vantec. More complete information can probably be obtained from Vantec.

Hope this gets you in the water with all of the desired functions, Len. We'll be expecting a picture . . . and a tape, of the completed "Lee" one of these days soon.

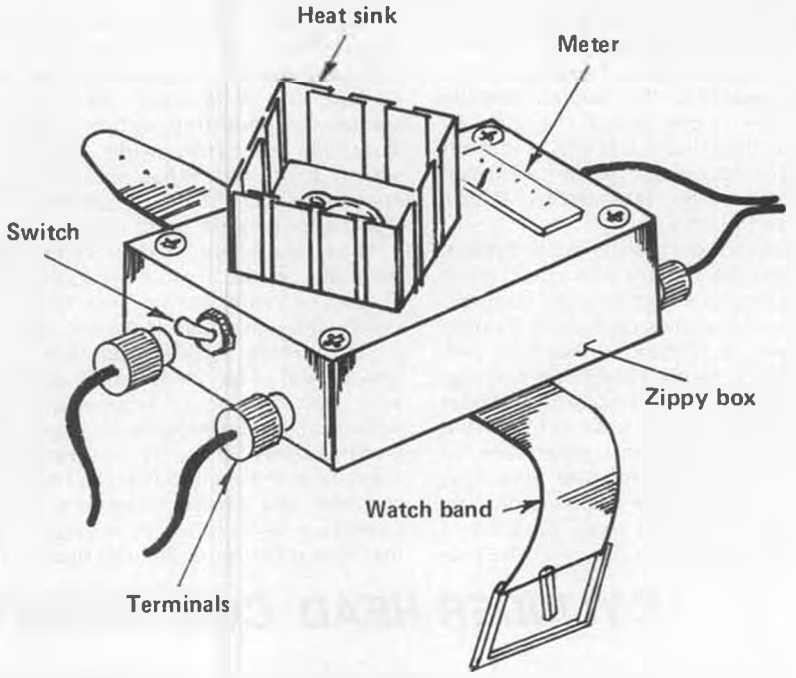
MIXING IT UP

Have you noted how R/C technology seems to sort of feed upon itself? Our more precise and more reliable radios now permit us to build much more sophisticated models, which soon require more of the R/C system, as in the example above. The more sophisticated radio then becomes available, allowing further development of the model, and on and on!

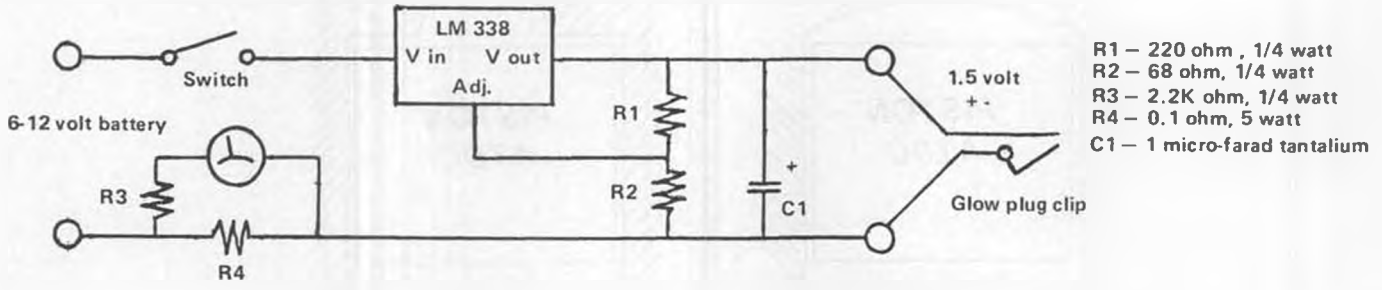
Another example of this is the many model designs now available that require mixing of the controls. One company that has recently introduced equipment to handle this without the mish-mash of mechanical couplers and levers in the model, is Airtronics. Its CS7P transmitter can be plug-in module equipped to handle most any mixing need you may have. Actually, the CS7P transmitter deserves your second look on its basic merits alone. As you may gather from the nomenclature, it is a seven-channel transmitter, and is available on all assigned frequencies, AM or FM, all changeable via internal plug-in modules.

But I started to tell you about its mixing capabilities. Also with internal change-

Continued on page 96

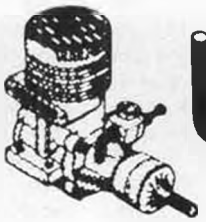


The Aussie LM-388 glow plug driver, shown here made for wrist mounting for control line combat. More information in the text.



Circuit of the LM-388 driver. All parts, with the exception of the meter, are readily available in the U.S.

FUEL LINES



JOE KLAUSE
P. O. Box 2699
Laguna Hills, CA 92653

"TRICK STUFF" EXPLANATIONS

Guys, the correspondence has been steady ever since last October's column. As you may recall, the major portion of that article described a custom head insert for the Fox Combat MK IV engine, but this also generated a lot of interest about head design in general. The questions I've had the last several weeks were mainly concerned with the squish band portion of the head. So, this month, I'll have a go at explaining the "squish band." Please note the style of that last sentence. Must be due to the letters from Aussie, British, Canadian, and New Zealand readers. Whatever, let's get on with it.

THE SQUISH BAND

What is it? Take a look at the accompanying drawing. The head on the left has a more or less dome shaped combustion chamber. It's sometimes called a hemi-head. The one on the right also has a hemispheric type chamber, but it also has a peripheral band that fits close to the piston at-top-dead-center (ATDC). That's the squish band . . . so named because it squeezes the fuel/air mixture towards the center under the glow or spark plug. Neat huh? But why is it used? Is it really necessary? To better understand the answers, let's review a little physics and history.

The physics part deals with detonation. Remember? That's when the fuel/air mixture reaches a high enough temperature to spontaneously ignite with a rather abrupt bang or "knock" rather than with a relatively smooth, controlled burning. It happens when radiation heat and heat due to compression combine to exceed the critical self-ignition temperature for the particular fuel/air mixture. Typically, this occurs when the flame front, initiated by the glow or spark plug, has a relatively long way to travel in the process of burning all the mixture. The further the distance the more the radiation heating of the yet-to-be burned mixture.

Today, detonation in the typical automobile engine is unusual. But during World War I, it was very common due to the poor quality of the gasoline . . . low self-ignition temperature. To alleviate this problem, an English gentleman by the name of David Ricardo developed the squish band head. Simply stated, he shortened the distance the flame front had to travel by squeezing the mixture towards the plug. Thus, there was less time for radiation heating and detonation.

Take another look at the drawing. On the left, the distance from the plug to the edge of the chamber, at the cylinder wall, is considerably farther than the head on the right. Here, the edge of the chamber is effectively where the inner edge of the squish band begins rather than at the cylinder wall.

Guys, that's what a squish band does. Obviously, it's a nice "trick" to use on high performance engines that have high compression ratios and attendant high fuel/air temperatures. Natural follow-on questions are: How wide should the squish band be? What should be the spacing between it and the piston ATDC? What about squish band taper?

Let's take them in their order. As a general rule, the area of the squish band should be equal to the area under the combustion chamber. However, as much as 60 percent squish bands are sometimes used. The ideal percentage will vary from engine to engine, and also with fuel and atmospheric conditions. Unfortunately, there is no convenient formula in this regard. Practical test data provides the answer, and it's usually close to a 50-50 ratio. So, if you want to machine a few experimental heads, try a 50% squish band "for starters."

The second question about head clearance or spacing likewise has no convenient formula for an answer. However, here are some general guidelines that have been pragmatically developed over many years. Very low or no-nitro fuel . . . use about three to five thousandths clearance. For very high nitro, 15 thousandths is a good starting point. Scale these figures for in between nitro percentages. As an aside, head spacing is also often called deck clearance.

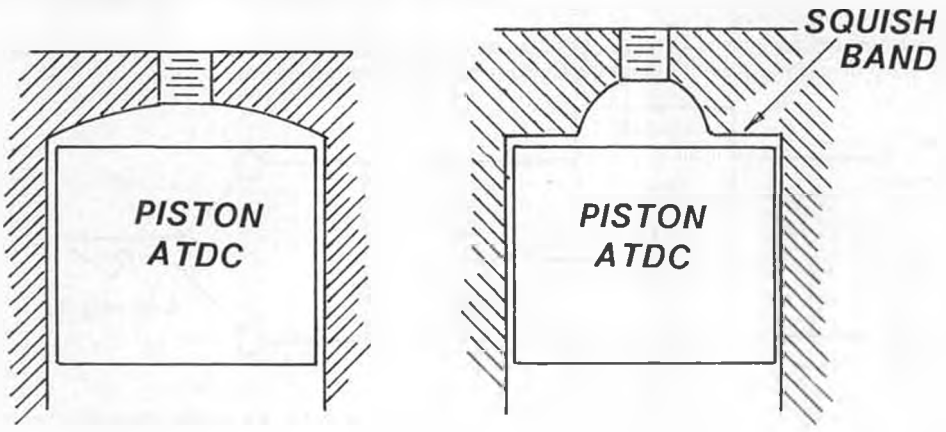
If all that sounds reasonably straightforward, let me muddy it up a bit. Moist or humid air generally calls for more clearance. Further, ideally, for given atmospheric conditions, a five thousandths spacing would be fine for all two-cycle engines up through .65's with any percentage of nitro! Instead of increasing head spacing, it would be better to increase the combustion chamber volume as you increase nitro content. However, as a practical matter, it's a lot easier to shim up the clearance than to machine another head with more chamber volume.

The last question concerns squish band taper. The reason it is used is to make the engine less critical to needle valve adjustments. A flat squish band abruptly jams the fuel/air mixture towards the center. In effect, it causes a shock wave that tends to disrupt the flame front, which begins moving away from the plug before the piston reaches top-dead-center. Complete burning then becomes more critical to the ratio of fuel to air. To get around this problem, a tapered squish band moves the mixture more gently towards the center. Stated another way, the amplitude of the shock wave is diminished, and the wave energy is spread out in time. Think about it a minute, and you'll see that it makes sense. Just like ocean waves down at the beach.

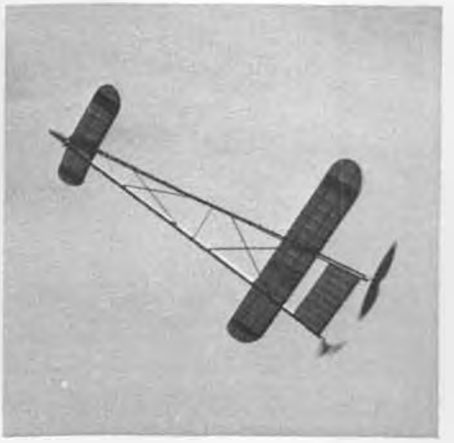
OK, those of you who have read this are now official, pseudo-experts on "squish bands." The next time you want to squish a band, go to a concert-in-the-park or parade, and just suck a lemon right in front of the tuba players.

P.S. A one to two-degree taper on the squish band is about right . . . •

CYLINDER HEAD CONFIGURATIONS



1. Jim Persson and Don Wrench at their usual station, running the Original Stockton Old Timer Annual.



2. A Carl Schmaedig Twin Pusher launched by Charlie Werle at the Stockton Annual.

PLUG SPARKS

By JOHN POND

This columnist's penchant for writing up contests will be even more noticeable this time, as his favorite O/T free flight meet, the Original Stockton Old Timer Annual, in its 24th year took place on September 29th and 30th.

Not enough credit can be given to SAM 32 (the AMPS) (Antique Model Place Society) for continuing this most delightful of all meets. Photo No. 1 shows the two main driving forces, C.D. Jim Persson (left) and President Don Wrench running the meet. Please note the background. This is the field that will host the SAM Champs. Neat, huh?

The Stockton Annual is run over two days, with the modeler's option to fly any of the events on either day. Saturday was a gorgeous day while Sunday was the direct antithesis, windy! Saturday did give this columnist time to check out his new stagger-frame twin pusher. Really goes, but like all twin pushers, the glide needs a hydraulic jack to keep it in the air.

Photo No. 2 shows Charlie Werle launching his Schmaedig "Skyscraper" Twin Pusher on its maiden flight. (Elevator was later moved back and an amount of incidence removed.) This design appeared in the 1935 Zaic Year Book and later in the Model Aircraft magazine in 1936. Popular twin!

This writer has always thought that a Playboy Senior powered by a hot Super Cyclone was about the best Class C combination going, but after viewing Tim Keppler's Ohlsson 60 powered Playboy, he had to admit this was also a good flying combination.

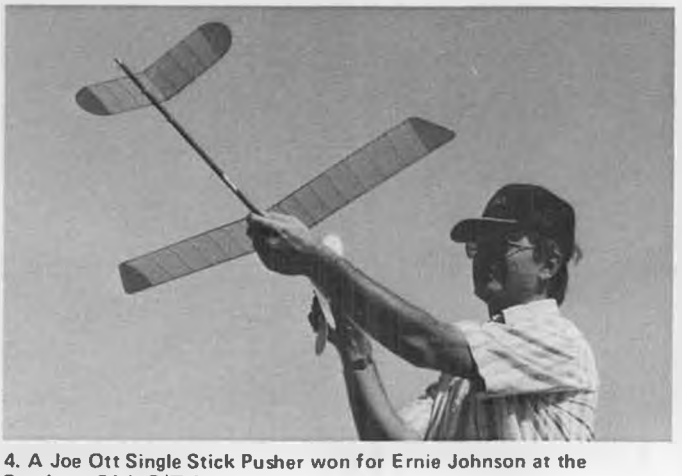
As can be seen in Photo No. 3, Tom is right proud of this flying machine, as it has won three times in the last three times out. Can't do much better than that! Talking about Playboy Senior models, bad news is that Tyro Models, headed up by Barnet Kernoff, is no longer producing these fine kits. From now, scratch building will be the order of the day! *(Not quite! Check Hobby Horn's ad in this issue! wcn)*

Might also mention that regardless of whether you are flying this design free flight or in the R/C events, the results are the same . . . winnah! A real tough design to beat.

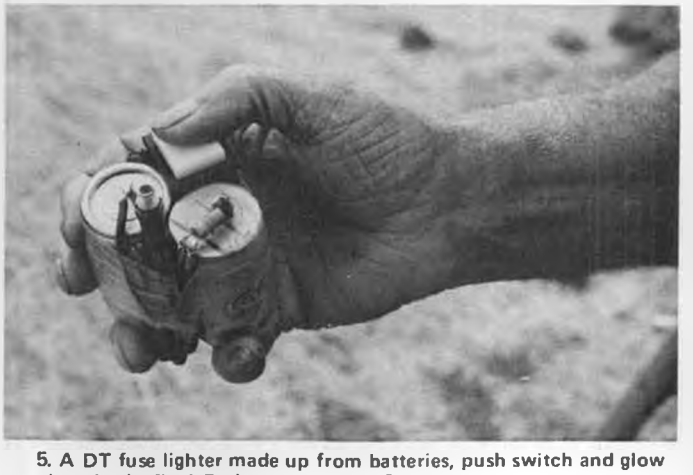
Some of the best darn rubber flying was done in the early morning by Ernie Johnson, with a Jot Ott single-stick pusher. As seen in Photo No. 4, this lightweight model flew almost like an indoor type model. Of interest is the underslung rudder that Ott designed into the model to keep it from spinning in the glide.

3. Tom Keppler with potent flying Ohlsson 60 powered Playboy Senior.

Single-stick pushers, in spite of their rather unpresupposing appearance, are the easiest models in the world to adjust. The only problem is in the glide when the propeller free wheels . . . sometimes jam-



4. A Joe Ott Single Stick Pusher won for Ernie Johnson at the Stockton 24th O/T Annual.



5. A DT fuse lighter made up from batteries, push switch and glow plug. Works fine! Brainstorm by Jim Persson.

10. Another gorgeous flying Gas Bird, by Bill Burleson, winner again!

7. Gordon Codding sent this shot of a beautifully reworked Ohlsson Pacemaker at Western & Rosecrans, 1939.

8. Al Staben with his winning Ohlsson 60 powered Lanzo Bomber. Three maxes!

ming and causing a spiral dive.

There has been considerable discussion among the experts (including Frank Zaic) that the existence of a rearward rudder does not prevent spins. This may be true, but a pusher properly flying is very tough to beat!

Ever try lighting the fuse on your dethermalizer setup in the wind? Sometimes you are lucky you don't burn off your tail feathers in the process. Jim Persson has solved this problem very neatly, as can be seen in Photo No. 5. The dethermalizer fuse lighter is simplicity itself, with two C-size batteries, a spring loaded push switch, and a glow plug. When the plug glows like a good plug should, the lighting of the fuse becomes a simple process. If you don't like carrying one of these, drop down in battery size. However, be ready to change batteries more often, as the glow plug does drain the batteries quickly.

While wandering around the field in search of a good subject, this writer ran across C.E. Roth, as can be seen in Photo No. 6, with his Earl Stahl "Hi-Climber." Here is a model that has plenty of performance, yet its size doesn't require that amount of rubber that costs an arm and a leg. Although he didn't win, Chuck had a real good time at the 24th Annual Stockton Old Timer Contest. And speaking of that, here are the results:

.020 Replica

1. Dick Lyons (Alert)	7:48
2. Bill Langenberg (Dodger)	6:37
3. Wes Funk (Foo 2U2)	5:17

9. A Lackey Zenith for Texaco, by John Pond. O.S. 40 four-cycle.

Scale

1. C.E. Roth Tiger Moth
2. Don Wrench Miles Arrow
3. Ron Booth Nesmith Cougar

Class A Ignition

1. Larry Clark (Miss Valiant/OR 19)	8:13
2. Don Wrench (Interceptor/ED)	6:24
3. Dick Lyons (Gas Bird/Hornet)	6:12

Class B Ignition

1. Dick Lyons (Kerswap/OR 23)	8:41
2. Art Watkins (Alert/OR 23)	6:34
3. Sal Taibi (Dodger/OR 29)	6:32

Class C Ignition

1. Tom Keppler (Playboy/OR 60)	15:00
2. Larry Clark (Albatross/Cyke)	8:17
3. Cliff Silva (Playboy Cabin/Cyke)	5:56

30 Second Antique

1. Lee Norcross (Powerhouse/McCoy 60)	1:36

Rubber Combined

1. Ernie Johnson (Ott Pusher)	8:43
2. Terry Thorkildson (Lamb Climber)	8:42
3. Bill Langenberg (Lamb Climber)	8:07

SWEEPSTAKES WINNER: TOM KEPPLER

SAM CHAMPS 1985

Just received a letter from Jack Jella, SAM West Coast Vice President, who is acting as SAM Champs Contest Manager. He informs this columnist the dates of the Champs at Madera have been set back one week to accommodate the requests of several groups who regard the original dates as a hardship.

Better paste this in your hat. The new dates are now June 24 to 27. Headquarters have been set up at the Madera Valley Inn (a Best Western Motel) with all 90 rooms reserved for SAM members. Incidentally, if you mention you are from

6. Good flying Earl Stahl "Hi-Climber" as created by C.E. Roth. Stockton Annual.

11. Eut Tileston scaled Lancer 72 design with a big OS 90 four-cycle neatly cowled in.

12. Mel Anderson in 1936 with a Bill Atwood X-44 model, at Lake Muroc. Photo provided by Bill Simpson.

13. Taken by Bruce Lester at the '38 Nationals, this photo shows Stott's original design.

14. Joe Percy, SAM 29, Ft. Worth, TX, at the West Coast SAM Champs, Merwin dichondra ranch, with scaled Riser Rider.

SAM, a discount (about 10%) will be given.

In the event you are unable to get a reservation at the Madera Valley Inn, another Best Western Motel, known as the Gateway, is also in the town of Madera. However, it only has 28 rooms.

Jella is working in conjunction with Russ James on motel reservations. No doubt, several motels in Fresno will also be reserved for SAM. The distance to the field from Madera and Fresno is only about ten miles difference, so no big problem on motels this time on the coast.

ENGINE OF THE MONTH

For this month's subject, we are pleased to present the Buzz 60, through the generosity of William Burleson, Editor and Publisher of the *Gridley Herald*, who became an instant engine collector by purchasing the engine collection of Guy "Speed" Hughes.

In 1947, Ohlsson and Rice dropped a bombshell on the model engine manufacturing industry when they reduced the price of all their engines to less than the dealer's discount. This, of course, forced many a manufacturer to fold up under such intense competition.

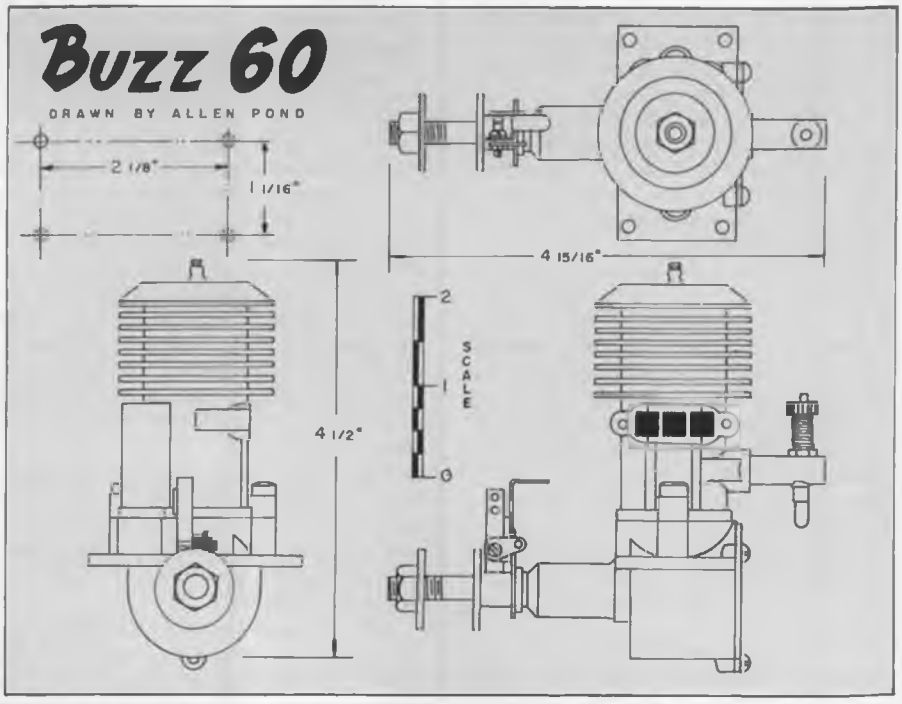
America's Hobby Center, of New York, had been marketing the Rodgers engines under the name of Genie, Ram, and Thor, at very attractive prices ranging from

15. In 1942, R.B. McKenna, now of Los Angeles area, built this Berkeley Buccaneer B Special. Ohlsson 23 power.

$4.95 to $8.95. To combat the Ohlsson prices, the AHC people, in conjunction with Judson Co., came out with a complete new line of engines known as the Buzz. These were made from a special aluminum alloy (probably a lead aluminum alloy), very much like the foregoing "slag" engines.

Announcement of the Class A, B, C, and D engines first appeared in the July 1948 issue of Model Airplane News. The first three engines (A, B, & C) were identically priced at $4.95. This was possible as all three engines used the same crankcase and stroke. The Class D version was another story, being much larger and priced at $9.95.

All Buzz engines were made of pressure die castings to obtain a smooth finish of the aluminum alloy. This idea of using close fitting parts made of aluminum alloy was developed during the war,



18. Frank Schinn, of local Winnipeg radio station, interviews Art Cooke in '38 about his winning Bunch powered Tlush Inspirer.

16. In 1952, there were two outstanding control line fliers in Australia, Monty Tyrell and Tony Farnan. Note matching tie and plane!

17. Walter Bungert, West Germany, built this pretty Joe Weathers "Mystery Man".

and Rogers, in conjunction with the Judson Co., was the first to use this low cost material.

To keep things as cheap as possible, the crankcase had no bearings, simply relying on the alloy itself. The piston and cylinder were finished to .0002 inch by a method called Ball-Sizing Process.

Of course, to use such materials in close fits, the piston had to be lubricated with gas and oil at a 2:1 mixture. Despite this, the engines did wear out very quickly.

Also worth mentioning, is the use of 24ST aluminum for the connecting rod, with no special bushings at each end of the machined bearing surface. The only real steel part was the crankshaft, made in two pieces, a crank pin forged in place, and the counterbalance and main shaft, all machined in one piece.

The Buzz 60 was the only engine to come without a tank, another attempt to save money, as a special tank would have been required for the larger Class D engine. (All other engines came with the same aluminum tanks.)

The Buzz 60 specifications reveal the engine had a bore of 1.00 in. and a stroke of .77 in. giving a displacement of .610 cu. in. The manufacturers claimed 9,000 rpm using a 12-inch propeller to give 1/4 h.p. All up weight was 9 ounces.

Flying Models' personnel, in their analysis of the Buzz 60, used an 11-inch Flo-Torque propeller to obtain 12,600 rpm, a rather remarkable figure when most of us thought 6,000 rpm with a "slag" engine was putting out good power. With the conventional 14-inch free flight Flo Torque, the FM people obtained 8,250 rpm.

This compares favorably with the manufacturer's claims of 9,800 rpm with a 12-inch propeller, 9,500 rpm using an 11-inch "Hi-Ball' prop, and 7,000 rpm with a 14-inch "Hi-Ball" prop.

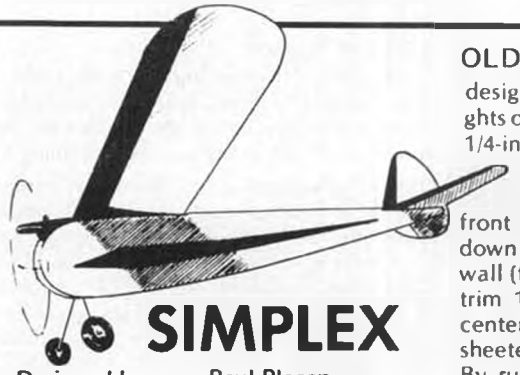
The most surprising feature of the Buzz 60 was the spring steel timer with tungsten steel points that gave no flutter. The timer is simplicity itself and looks so simple, one would not expect good results for rpm ratings as high as 12,000 rpm.

The Buzz engine, despite its being produced as cheaply as possible, wasn't a bad running engine for the price. If one followed the practice of using heavy oil ratios in the fuel mixture, a modeler could expect the engine to last at least one season of competitions.

Later on, America's Hobby Center, who was the exclusive distributors for the Buzz engines, came out with a glow version. However, this proved to be a real dud, as the glow fuel caused even more wear and, of course, a shorter life for the aluminum mating parts.

With the passing of the Buzz engines, another era of cheap, inexpensive engines was closed, to be reopened in the 1/2A

Continued on page 72



OLD TIMER Model of the Month

SIMPLEX

Designed by: Paul Plecan
Drawn by: Al Patterson
Text by: Bill Northrop

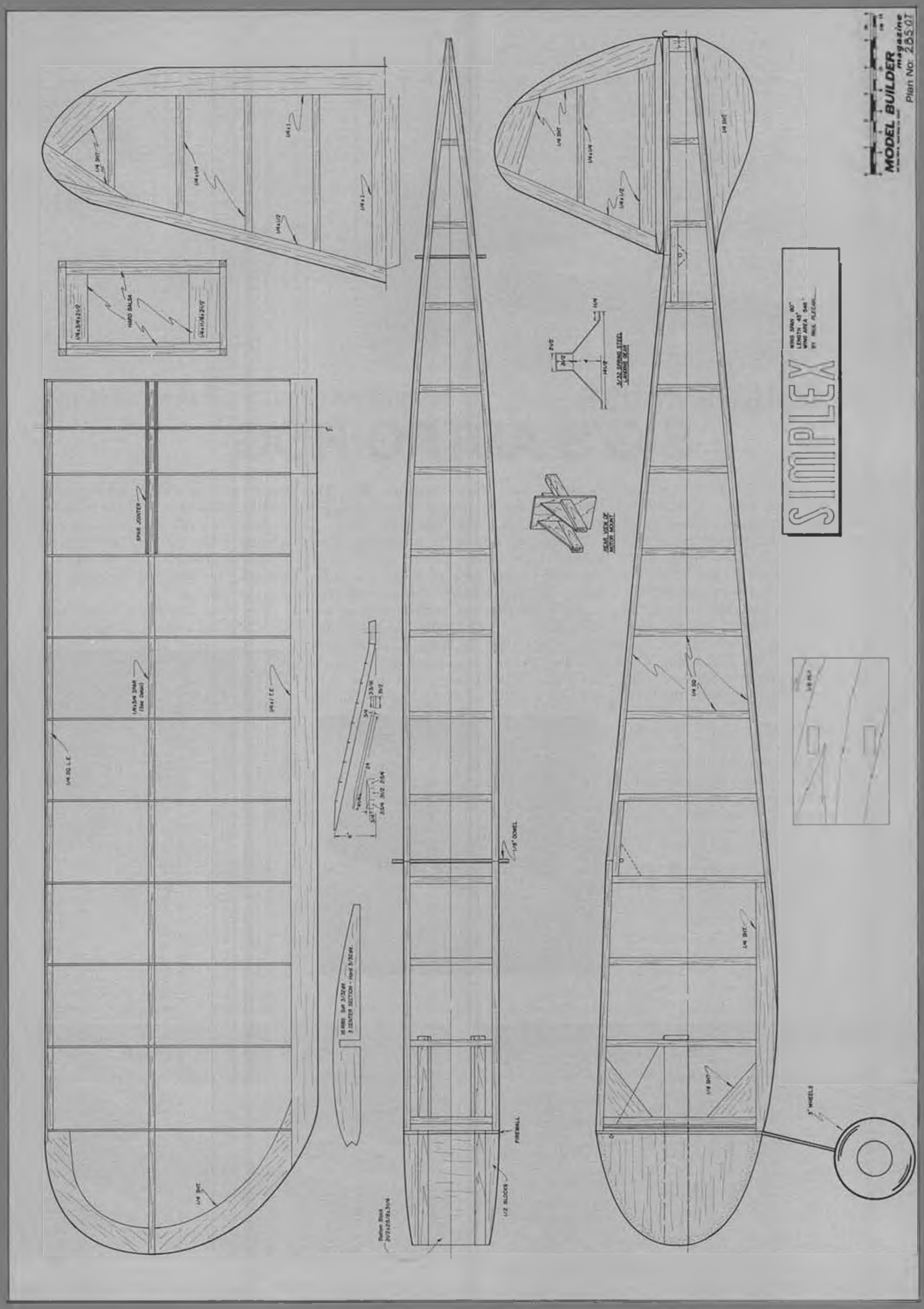
When Paul Plecan named this Old Timer of the Month, he couldn't have made a better choice. The "Simplex" is your basically constructed model airplane. The fuselage is four longerons with verticals and cross-pieces perpendicular to the centerline. The wing is a 10 by 60-inch constant cord, straight dihedral structure with a sturdy spar, leading edge, and trailing edge, with sheet wingtips, based on the old reliable Clark-Y airfoil. Stab and fin are built from various sizes of 1/4-inch thick strip. Plans appeared in the February '41 issue of *Air Trails*.

The unique thing about the Simplex is that as simple, traditional, and "Plain Jane" as the structure may be, it doesn't look klutzy. Functional, clean lines have a way of coming out on top in the appearance category.

Of course, every modeler (as compared to a parts assembler) has some "improvement" ideas for every design. I would suggest only a few thoughts on Paul's Simplex. Add a triangular 1/4-inch gusset that will surround the rear wing hold-down dowel (something to stick covering to) and add a front hold-down dowel about one inch down and just ahead of the plywood firewall (through the side cowl blocks). Also, trim 1/16-inch off the top of the three center section ribs so that area can be sheeted with 1/16 balsa (grain spanwise). By running your wing hold-down rubber bands criss-cross, you'll now avoid any damage to open covering material from the rubber tension.

By the way, as sturdy and light as this five-footer will be, it is an excellent choice for electric power. And if you wish to prevent loss of the model (the original flew away on its first day of testing, 33 minutes O.O.S. on a 15-second engine run!), radio can be added quite easily. For the rudder, measure in three inches from the trailing edge at the fin base and install two vertical 1/4-square spars, spaced 1/16 apart, from bottom to top. Trim away existing pieces to fit. For the elevator, you'll have to split it in two pieces to clear the rudder, beginning at the first stab rib out from the center. On the other hand, we've seen several models where only half an elevator is used...one side only. Much simpler (Simplex?) and works fine, with no side effects. A two to two and-a-half inch elevator chord should be sufficient.

Oh yes, Paul did mention the balance point. It's at the main wing spar. Again... Simple. Huh? •


MODEL BUILDER magazine
Plan No. 285.07
SIMPLEX

PRODUCT$ IN U$E

By DEWEY NEWBOLD and JAMES CUMMINGS

SIG'S ASTRO HOG

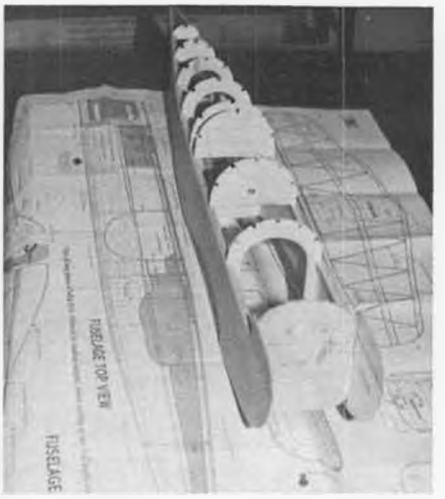
Recently, Al Novotnik asked if I would be interested in doing a kit review article for **Model Builder.** Sure, I said, and reminded him that my interest areas are pattern and sport scale. A few nights later, Al called and asked me if I would like to review a very new, but very old pattern airplane. Having noticed ads recently for Sig's Astro Hog kit, I knew immediately what he was referring to. For those of you who are not aware, the Astro Hog is a bona-fide, contest-winning pattern ship, having placed 1st through 4th at the 1958 Nationals.

Designed by Fred Dunn, of California, the Astro Hog was the first really successful low-wing, aileron-controlled R/C model. (*The name came from an equally famous, but earlier design, the Smog Hog, by Howard Bonner, who was also a manufacturer of one of the early proportional radios. wcn)* An Astro Hog kit was produced by the Berkeley Company, but production ceased in 1961 when that company went out of business. Sig Manufacturing Co. now owns the old Berkeley kit line, and today's version of the Astro Hog is a faithful reproduction of the original with a few updates. The most visible changes are the switch to tricycle landing gear and strip ailerons in place of the original "barn door" ailerons and tail-wheel on the prototype. A tail dragger conversion kit is available if desired.

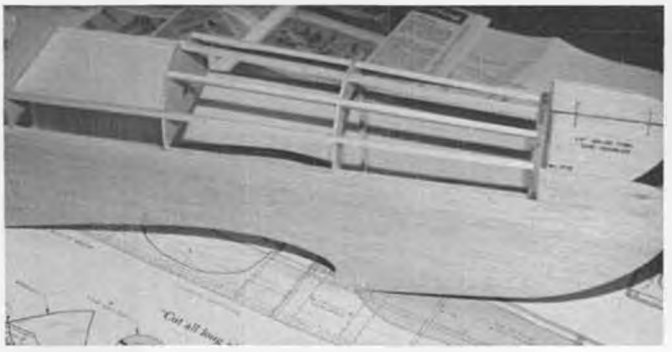
If you are not yet a proficient flyer, don't let the word "pattern ship" scare you. the Astro Hog is a far cry from today's guided missiles. The qualities that made it the first successful low-wing design, make it an ideal first low-winger for the novice flyer of today. The original ship had to carry larger and heavier radio equipment than today's and do so with only a K & B "Torp" .35 for power! This required a thick airfoil, light wing loading, and lots of dihedral. These features make it about as stable and forgiving a plane as anyone could ask for, yet it will still perform any maneuver in the book . . . although not with the precision of more modern designs.

The Astro Hog has a 71-inch wing span and 824 sq. inches of wing area. Sig

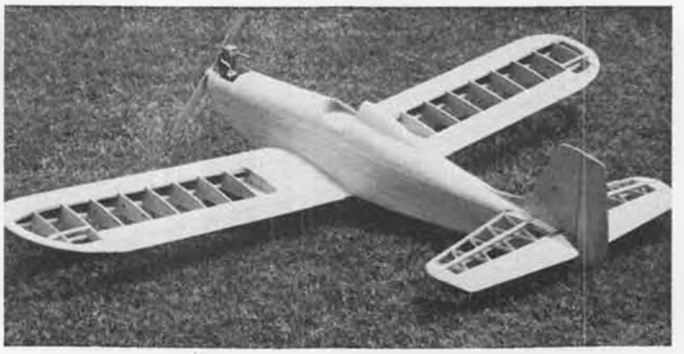
OS 90 four-stroke sticks out a little too much, but nose was not modified for kit review.



Fuselage in early stages, shows basic construction. Note clarity of plans. A Sig trademark.



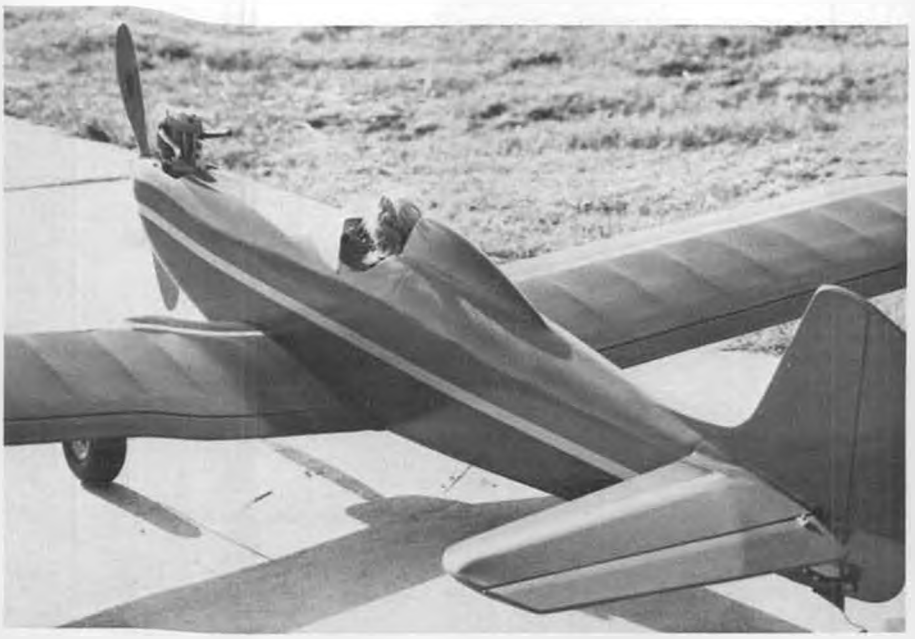
Stringers have been added, sheeting comes next. Printing on balsa parts is a great aid during construction.



For pride in workmanship there's nothing so inspiring as a nicely sanded out balsa airframe. Very few changes from original "Hog."

recommends a .45 to .60 two-stroke, or a .60 to .90 four-stroke engine. A non-schnuerle .61 two-stroke such as the Webra Blackhead .61 or K & B .61 would be an excellent choice for the Astro Hog, and these are quite reasonably priced. We opted for an O.S. FS-90 because we were anxious to try a four-stroke and it seemed in keeping with the Astro's Hog's character and purpose. *(A dieselized .45 to .61 would also do a nice, quiet, powerful job. wcn).*

James Cummings, who built the kit used for our review, is part owner of Texas R/C hobbies and an experienced and prolific builder. He is constantly turning out beautiful airplanes for himself and a few lucky clients. James was attracted to the Astro Hog because he likes airplanes with slow, graceful flight characteristics and his business and building schedule had left him little time for flying in the last several months. The Astro makes an ideal airplane on which to limber-up one's thumbs.



All decked out in Koverall and Skybright, the Sig Astro Hog looks every bit the classic that it is. For more authenticity, you can install "barn door" ailerons, but the strips are easier.

GENERAL DESCRIPTION

The first thing one sees upon opening the kit box is a 32-page, photo-illustrated instruction manual that has become a hallmark of Sig kits. Everything is described, including minute details of the radio installation, covering and finishing, and flying. The clear and concise text is complimented by excellent photos of each stage of construction. Sig put a lot of effort into this part of the kit and they deserve a pat on the back for it. For the sake of nostalgia, there is even a reprint of the original Astro Hog construction article from *Model Airplane News* (April, 1958). I can honestly say that if you follow the instructions to the letter, you are virtually assured success.

Along with the usual sheet and strip balsa, there are fifteen sheets of die-cut parts and five printed balsa sheets. The hardware package is very complete, with many items not routinely found in kits. This is one plane that won't nickle-and-dime you to death when it comes time for final assembly and radio installation. Control horns, hinges, clevises, and bolts are all there, plus aluminum engine mounts Some die-cut plywood parts and a molded ABS plastic headrest complete the package.

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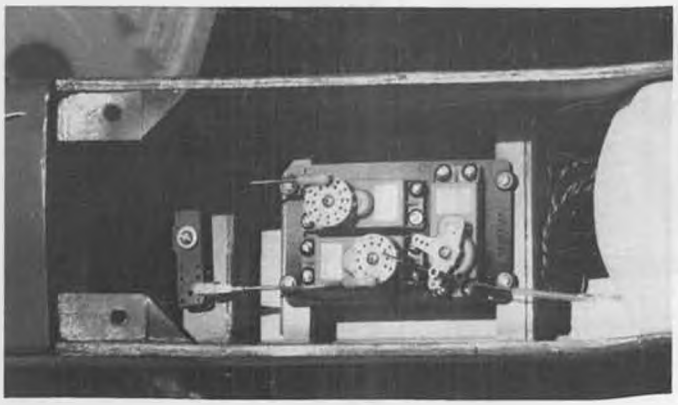
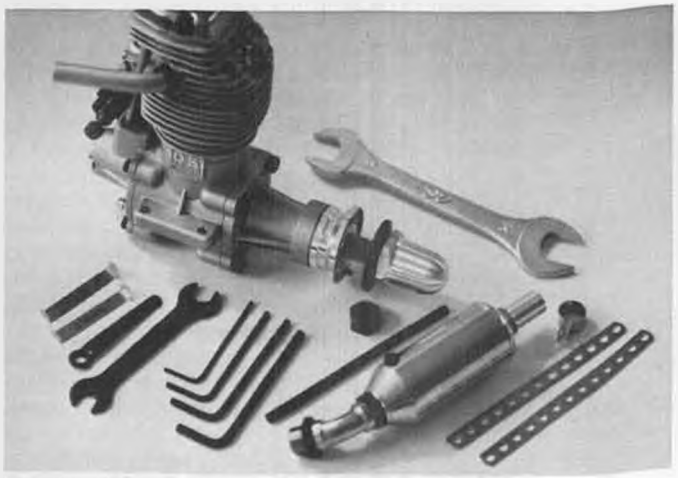
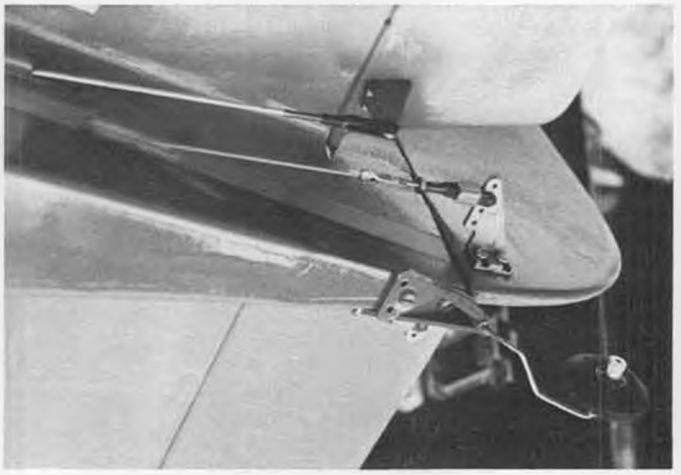


Loads of room for today's radios, where it used to be crowded with the old reed systems. Dowels and rubber bands are gone, too!

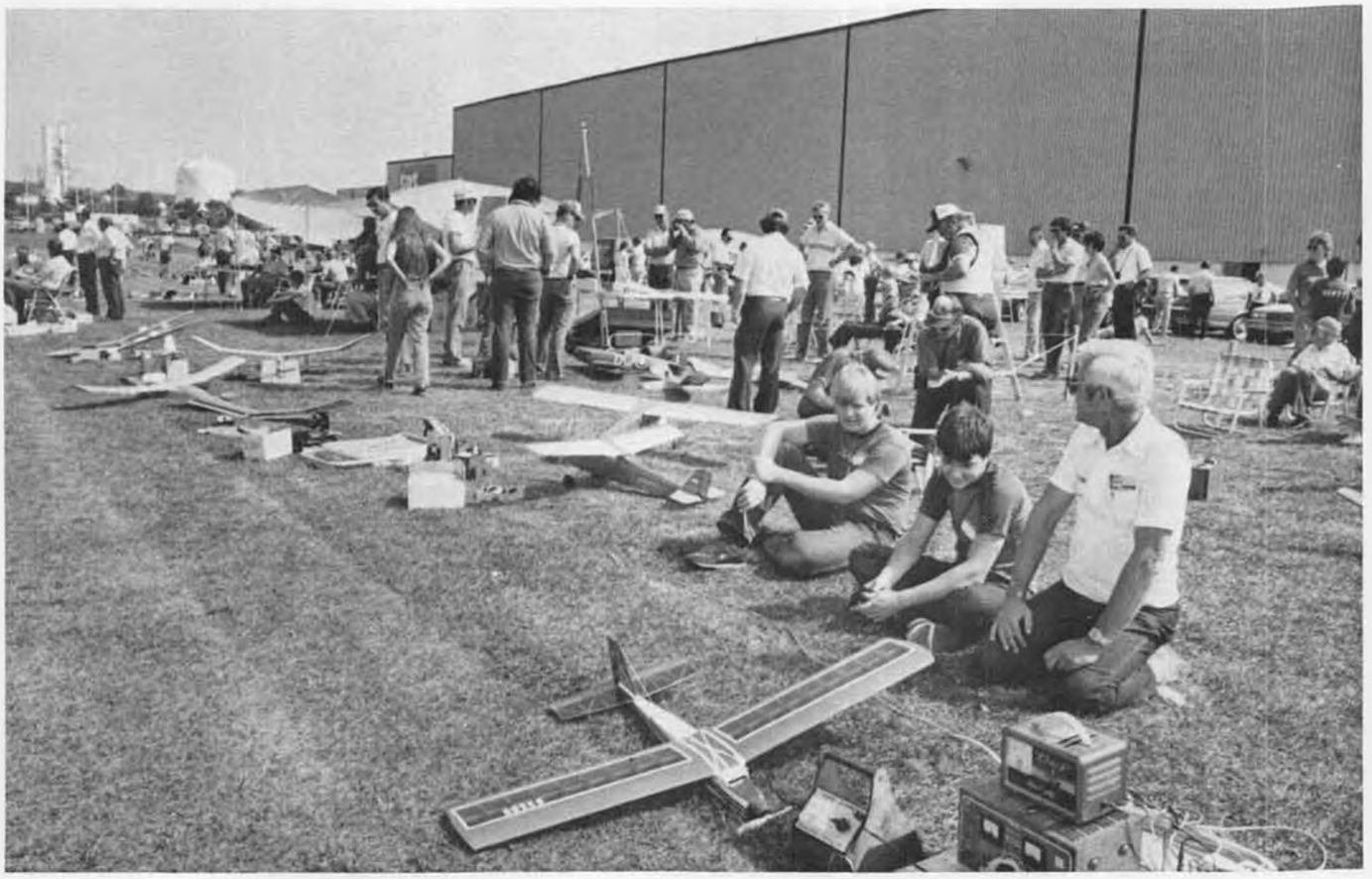
Who could be more appropriate to occupy the cockpit of a Smog Hog than "Miss Piggy?!" Now to find a helmet with ear pockets!



The O.S. 90 four-cycle engine and its tool kit. Truly a deluxe power package for whatever model it will fly.



Rudder and elevator control linkages. Note that the rudder is operated by cables, and linked to the tail wheel for ground handling.



View of the pit area at the Fifth Annual KRC Electric Fly. Note the contest-furnished battery charger station. There were four such stations, all chargers supplied by Robbe Model Sport. Photo by Charlie Spear, whose complete report on the event begins on page 43.

ELECTRIC POWER

By MITCH POLING

Bob Kopski was kind enough to send me an account of the KRC Electric Fly held September 22 and 23. However, as **Model Builder** had already scheduled a complete contest report, appearing elsewhere in this issue, we'll just summarize the results.

In order, first through fourth, for *All Up-Last Down;* Brian Bailie (Drifter II), Frank Heinrich (Robbe ASW 17), Adrian Koerner (Olympic II), Bob Boucher (Challenger). The Challenger is a new kit by Astro Flight, and should be available by the time this column is out. For *Best Looking,* in order, Keith Shaw (Spitfire), Vic Walpole (Saggita) and Ellis Grumer (Grandpa), Keith Shaw (Zombie) and Les Adams (modified Malibu). *Most Aerobatic:* Keith Shaw (Coulumbia), George Watson (Wasp) and Charlie Hampton (Wasp), Don Belfort (Wasp) and Charles Sylvia (Merlin). The Wasp is available as a kit from Leisure Electronics. *Longest Flight:* Brian Bailie (Drifter II), Adrian Koerner (Olympic II), Ted Davey (Prophet) and Bill Hale, Bob Boucher (Challenger). These listings are for both days, if only one person is listed, it is because he won both days! Overall meet high times were Brian Bailie, then Adrian Koerner.

Ax Man 05/075 motor, certainly worth a try at only $2.50 each! See text for more info.

Now for details on a few planes. . . Charles Sylvia of Middleboro, MA., won third in aerobatic with his original Merlin. This is a handsome low winger, weighing 5-1/4 lbs with an Astro Cobalt 25 on 14 1.2 Ah. cells and a 9x4 prop. It looks very good, and an aerobatic electric of this type is not available at present. There is a need for it! I think there would be a market for a kit of this type. Keith Shaw's (Ann Arbor, Michigan) semi-scale Horten II-M provided much entertainment. The crowd was delighted by expert piloting, a dazzling white streak in the air, and the penetrating saweeeeee scream in the dives and pullouts! The Horten is 82-inch span, 850 square inches, NACA 0012 airfoil, 37 ounces. The power is a Leisure 05 direct drive on a 6x4 prop. Walt Kessler (Afton, NY), had a fleet of five planes, including a scale "Woodhopper" ultralight. I think an electric model ultralight would make a natural ready-to-fly electric. How about it, manufacturers? Bob Boucher (Astro Flight) did well with his very clean Challenger, this features simple construction and excellent performance. It is kitted by Astro Flight. Bob's was powered by an 05 Astro Cobalt with gear drive turning the smaller Geist folding prop. Seven 800 mah cells supplied the power. This plane looks good for both sport and competition flying.

Thanks, Bob, for the report and photos! I reported on the Boeing Hawks elec-

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A one-man electrical storm, Keith Shaw, Ann Arbor, Michigan, dominated nearly all of the fun-fly activities: in scale, with his original design Spitfire, in aerobatics with his "Coulombia" (Dave Brown color scheme), and his flying wing was a complete show stopper!

KRC 5TH ANNUAL ELECTRIC FLY

By CHARLIE SPEAR . . . The most prestigious electric event of the year, the one which summarizes the ever-increasing interest and activity in radio controlled, electric powered model aircraft.

"Hello, Triple A? I would like a set of trip maps from Mocksville, North Carolina to Hatfield, Pennsylvania. You say you don't know where Hatfield is located, well, don't worry, I had to find it on the map myself and discovered it was just a tiny community north of Philadelphia." Hatfield may be a dot on the map, but it was once again the site for the largest event of its kind east of the Mississippi.

I'm speaking of the Keystone R/C Club's Fifth Annual KRC Electric Fly held last September 22nd and 23rd. As in past years, it was again billed as a meet that promotes only electric flying, so it was not your usual run-of-the-mill type contest. As advertised, any type of aircraft would be welcome, just as long as it was electric powered. It is intended to be strictly a fun fly with a definite emphasis on fun!

I had been reading that this event had been growing in popularity each year, but even so, I was completely unprepared upon arrival to find that 52 contestants had registered from 13 different states, along with several entries from Canada. At one time, just for my own curiosity, I counted over 98 different types of electric powered models in the pit areas and on the flight line. These ranged from sailplane types, old-timey free flight models, sport airplanes, aerobatic designs and scale models, all fitted out for the quiet power, the wave of the future, as I once heard it expressed.

As it had been in past years, there was no real serious "tooth and nail" type competition. Although there were awards given each day for "Best Looking," "Most Aerobatic," and the longest flight, which they traditionally call "All Up and Last Down." Brian Bailie of Robbinsville, New Jersey won the awards for the longest flight on both Saturday and Sunday. I did not catch Brian's time for his Sunday flight, but his time on Saturday was a whopping total of 46 minutes and 26 seconds. Brian easily out-flew his competitors with a Drifter II equipped with a 7-6 prop on a MRC 05 ferrite race car motor powered by six cells. Of course, Brian's uncanny ability to skip from thermal to thermal did not hurt him one bit. Keith Shaw, of Ann Arbor, Michigan, took all of the first places in the rest of the competition on both Saturday and Sunday. Keith took the honors for "Best Looking" with his Mark 1A Spitfire, and for "Most Aerobatic" with his Coulombia (remember your physics).

Keith's performances just had to be one of the highlights in the two days of

Dwight Holley, Bethel, CT, former FAI soaring world champ, with his cobalt 05 powered original design. Span is 40 inches.

Ellis Grumer, Phillipsburg, NJ, with his Smith Mini-Plane "Granpa", and Porterfield. Both are excellent fliers.

Heinz Koerner, North Wales, PA, with Astro 075 powered Partaenavia twin, and 02 four-motored original design.

Les Adams, Arlington Heights, IL, with his 72-inch span Porterfield, Astro powered with 2.7 to 1 belt drive. Uses his own speed control.

Old flying buddy of MB's Editor, Nelson Whitman, Simsbury, CT, with floatplane collection that flew just fine without water!

Robbe Model Sport's Frank Heinrich (left) with Robbe "Argo", and Jeff Surgnier with his Robbe ASW-17, both with electric power units.

Jeff Surgnier checks some of the Robbe Automax 8 chargers that were supplied for free use by the contestants, courtesy of Robbe.

flying. Keith dazzled the crowd with his very scale-like Mark 1A Spitfire, complete with retracts. The Spitfire is an original design, scaled up to a span of 63 inches from a small 3-view. This very accurate looking reproduction was powered by an Astro Flight Cobalt 40 motor and an 18-cell battery pack. The total weight of the Spitfire was 5-1/2 pounds, but it flew with completely incredible aerobatic precision. As an encore, Keith brought out his old stand-by, the "Coulombia," which looks every bit just like a miniature pattern ship. In fact, Keith flew many of the new turnaround pattern maneuvers to the delight of the rest of the contestants. Just to prove that Keith is an electric flier extraordinary, he also flew his old timer "Zombie" in each day's "All Up and Last Down" event. Keith's "Zombie," with its beautiful transparent blue Monokoted finish just had to be seen in the air to be appreciated. Sandwiched in among these performances, Keith introduced his new flying wing. The model, which spans 82 inches and with an overall weight of 37 ounces, was very similar to the old Horten II-M design. Its 850 square inches was pusher driven by a Leisure LT-50 (05) direct drive motor, powered by a six-cell battery pack. The incredible speed and maneuverability of this flying wing had everyone completely electrified (no pun intended) including contestants and spectators alike.

As an old sailplaner, another one of the highlights for me especially was the outstanding performances by the factory representatives from Robbe Model Sport, Frank Heinrich and Jeff Surgnier, of Plainsboro, New Jersey. Frank had converted Robbe's high performance

Ted Davey, Davey Systems Corp., with his latest kit, Curtiss Robin, and the Prophet glider. Prophet plans now show electric mods.

Larry 'SR Batteries' Sribnick and his Kodak Disc/Olympic 650 photoplane. Larry is also a columnist for *Popular Photography*.

Bob 'Astro Flight' Boucher with his new Astro Challenger. Span 72 inches, 39 ounces, geared Astro 05 cobalt with seven cells.

At the KRC Electric Fly Clinic's motor home (l to r); CD Bob Kopski, Dwight Holley, Heinz Koerner, and Adrian Koerner.

Jay Gerber, photog for NFL Films, was there to shoot some material for a future AMA film on electric flight.

sailplane, the "Argo," to fully electric power, while Jeff had done the same, only to Robbe's stand-off scale sailplane, the "ASW-17." Both were equipped with their folding banana prop, their Elt-Max 30G geared motor, and their Speed-Max Controller. These conversions turned out to be excellent performers with a seemingly long motor run, in addition to being very good looking sailplanes. Frank and Jeff are to be commended for their contribution of almost an unlimited number of Robbe Automatic Chargers for free use by all of the contestants.

I could go on and on about the quality of the airplanes seen and the flying capabilities of all of the electric powered models entered, as I never really did see a bad flight from any of the contestants. Maybe all of my readers could watch for a new film on electric flying. Seen at the meet was Jay Gerber, famed cinematographer of NFL and AMA films, busily recording all of the varied models and activities of the day.

The annual KRC Electric Clinic, whicr again this year was managed by Heinz Koerner of North Wales, Pennsylvania, provided all kinds of technical assistance, tools, supplies, and especially conversation with anyone either interested in electric flying or seeking help. Throughout each day, informal seminars were held at Heinz's motor home. Both Larry Sribnick of SR Battery fame, and Bob Boucher representing Astro Flight, Inc. graciously joined in the spirit of the large crowds attending the seminars. Both Larry and Bob offered tips and advice based on extensive experience and certainly fielded many tough questions.

Large crowds of spectators attended both days to near perfect weather. Most everyone attending could not believe the summer-like conditions with just a gentle breeze. The Keystone R/C Club's flying site is very well laid out. They have a very active membership and run a very well organized model airplane meet. They had, in addition to on-field refreshments

Ken Stinson, Telford, PA, with semi-scale American Eaglet. Span 80 inches, 40 ounces, Pittman cobalt, six cells. Launch with care!

(very reasonably priced), door prizes, surprise events and an all day long raffle. Prizes for the raffles included battery packs, speed controllers, battery chargers, kits, complete electric outfits and an Airtronics XL Four-channel FM radio. The raf-

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Arthur Garzon, Lester, PA, with his Partaenavia Victor P68. From Astro kit, twin Astro 075 motors, eight cells.

Brian Bailie, Robbinsville, NJ, with his very unusual computor designed sailplane. Its 36 solar cells produce 36 watts.

INDOOR ELECTRIC — '84 NATS

By MITCH POLING . . . Originated at the IMS Model Trade Show, Pasadena, California, in 1979, and demonstrated at the show every year since, indoor electric powered R/C competition now comes to the AMA Nats, starting at Reno in 1984. The author was involved in that first meet, and tells you all about it.

The Nats for the first time ever had an indoor R/C electric event, and the location was fantastic, the Centennial Coliseum in Reno. The room for the indoor flying was available all hours of the day, and it had no obstructions, an area 300 x 300 feet, and a 40 foot ceiling. This was luxury compared to the area at the IMS show, where such events were first introduced to modeling. The duration events were on August 8th, from 5 to 9:30 p.m., the scale event was on the 9th, same time. The rules were quite simple: for duration, maximum span eight feet, maximum weight 24 ounces, maximum wing loading three ounces/square foot. The plane had to fly a figure-eight course. For scale, the maximum wing loading was 3-1/2 ounces/square foot, maximum weight 28 ounces, maximum span eight feet. All planes had to have an independent on-off control. My experience with these rules is that they work very well indeed, and all the planes at Reno qualified.

There were three entries in the duration event; John Evan's EIO-1 (electric indoor-outdoor number one), Tony and Addie Naccarato's Astro Turtle, and my Electric Easy Bee. John lives in Reno, and had tested his plane both in the Coliseum and outdoors. His plane was immaculate, excellent in workmanship and design. It is built on the lines of a conventional glider, with an 88-inch wingspan, a flat center section, and dihedral tips. It flew on an Astro 035 turning a 6x3 cut to 5-1/4 x 3. Three sub-C Ni-Cds brought the weight to 21 ounces on a wing area of 880 square inches, or 1035 square inches including the stabilizer, which was allowed under the rules. John covered the tops of the wings and the fuselage with Japanese tissue, and the bottom of the wings with Micafilm. The Micafilm makes a very strong wing and is quite light. It allows the plane to be used both indoors and outdoors. The plane was lightly sprayed with

The author with his Sopwith Tabloid, which first appeared at IMS Show competition.

Indoor duration fliers (l to r): Addie and son, Tony Naccarato, Mitch Poling, and John Evans. Addie holds Unlimited type R/C rubber ship.

Electric powered Sorrell "Guppy" by Addie Naccarato. Similarity to Hiperbipe and Hiperlight is obvious. Note all the lightening holes.

Addie's electric powered Farman as seen in flight in the lead photo. Plane has been star performer at IMS Show for several years.

Addie and Tony with "Astro Turtle". Pic taken at IMS pre-trials. Ship holds unofficial endurance mark of 1-1/2 hrs plus, during show!

Turtle flew into wall after radio failure. Addie had it back together in an hour, thanks to Hot Stuff, and it went on to win contest!

Addie and her "Little Arc" electric ukie. Designed for beginners. Can't *some* manufacturer realize the potential of this combination!?

Rubber powered Farman flew just as well . . but not as long, as electric version. Carlo Godel gives Addie a hand . Note prop size.

Aerogloss clear. The receiver, servos, and receiver batteries were the Tower Hobbies mini-flight system used with a Cox four-channel transmitter. The Tower system performed perfectly in the steel framed building, which is a good test! Everyone I know who has a Tower mini-system has been quite pleased with it.

My Electric Easy Bee had not been tested; it is a new direction in indoor R/C for me. It is a "minimum" plane, much like an Easy B indoor. It was made of 1/8 stick balsa and Japanese tissue. The total airframe weight was 1.5 ounces, with a span of five feet. It had an area of four square feet, and an all up flying weight of 9 ounces (that's right! Nine ounces!). It used a VL 101 with three AA GE Ni-Cds, and the Cannon micro radio system. The receiver battery was the 60 mah cells from a GC-9 nine-volt rechargeable transistor radio battery. Controls are via thread cable, which is very positive and reliable. On-off was with a servo and toggle switch.

Addie and Tony Naccarato's Astro Turtle is a well tested plane, it has flown for several of the IMS shows, and holds the unofficial indoor R/C record. It is in the more traditional glider style, with a straight center wing section and dihedral tips. It has an eight-foot span, and eight square feet of area, and an all up weight of 24 ounces. It is powered by an Astro 020 turning a 5-1/4 x 3 prop on four sub-C cells. The Cannon micro radio is used.

Now on to the flying! John Evans started out with his EIO-1, and it flew very well indeed, with just the right amount of power for steady flight with the motor on. The EIO-1 is quite impressive, John has done it right. He also made it look easy! I know it isn't! John did several test flights, finishing with an excellent 18-minute flight on constant power (no motor on-off). John did not do a figure-eight course, just a circular one, in order not to risk the plane. A figure-eight is quite difficult indoors, again, I know! I think John could have gained at least 30% more time with on-off, which shows that he has a very efficient design.

I tried my Electric Easy Bee, but it was an untested design, which meant I had problems! The wing was too flexible, and it would distort in flight, so no lift! The best I could do was a glide to the floor from launch. However, I think the concept of small and light is a good one, and with a better wing this plane should fly. I'm going to keep working on it! My goal is a plane that can be flown in an ordinary gym without any difficulty.

Tony flew the Astro Turtle in his usual flawless style. Tony makes indoor flying look easy, and he did the figure-eights with ease, no easy feat. However, potential disaster struck, he had a receiver failure, and the plane struck the wall. That shattered the wing, but Addie got right to it, and did a very complicated repair in less than an hour! Tony flew the repaired Astro Turtle with a new receiver to the best time of over 24 minutes, which included the figure-eights. Tony has a very special way of flying the figure-eights, which is very efficient. He flies the plane into the loop of the figure-eight with power, climbing as he does so. At the top of the loop he is also at max height, then he lets the plane descend in the last half of the loop and cuts the power as it goes into the straight crossover part of the horizontal eight. Power goes on again as the plane leaves the crossover, and it again climbs into the loop of the eight. This is all very smooth, and the plane is under power about 2/3 of the time, which lengthens the flight time considerably. Tony took a well deserved first place, John second, and I took third (by default!).

Two things impressed me especially about this first day of flying. One was how efficient the EIO-1 and the Astro Turtle were, both flew on direct drive Astro 020's and 5 or 6-inch props with only three or four cells, and they did it easily, at Reno's 5000 foot elevation. This says a lot for the "classic" type of glider design. The other was the enthusiasm of the audience. They applauded every flight and every effort; you had the feeling they were rooting for you! They also waited quite patiently for each flight, even though there were often delays. I definitely got the feeling that indoor R/C has potential as a spectator sport!

The next day was scale, I entered my Sopwith Tabloid, and Tony and Addie entered their Farman Moustique (they brought along their Sorrell Guppy too, but it was not flown). The Tabloid is 1/6th scale, with a five-foot wingspan, all up weight 24 ounces, with a Cannon micro radio and an Astro 035 on six AA Ni-Cds and belt drive. At sea level I use an 11x4

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A keen competitor, even as pit man, "Da Dirt" (Dan Rutherford) gives his driver a head start (car disappearing at far left). Other pit guys (l to r) are: Roger Moore, Gary Evert, Tom Peterson, and Bill Amick. It was the start of a heat race in Seattle.

R/C AUTO NEWS

By DAN RUTHERFORD PHOTOS BY AUTHOR

It seems as if we have a problem. Not a huge problem, mind you. Not even a big deal within the relatively limited numbers of hobbyists here in hobby land. The problem: 1/8-scale, gas-powered, off-road cars are not being raced in any great numbers here in the U.S.

That's crazy! Modelers here started the whole RC thing with model airplanes. A number of years ago RC cars got their start right here, first with the 1/8 road cars, then 1/12 gas-powered road cars which evolved into the popular electrics now seen world-wide. While the 1/10 off-road electrics were imported as a product, as far as I know it was here in the States the vehicles were first utilized for get-down, get-dirty competition, and that whole thing has now spread across the land and is being picked up in many other countries.

However, for some reason that I truly cannot understand, the 1/8 off-road critters, powered by a wide variety of mean, nasty .21's are very rarely seen here.

And these guys are super trick! There are any number of two-wheel drive numbers available. In fact, I have a very early version dating back to about '79 that a fellow was planning to import from Japan. It is crude, too crude to even play with anymore; even when it was new we took it to a school-yard once, a dirt pit twice, and then decided its only mission in life would be to blast meadow muffins to smithereens in the horse pasture behind our house. While it has proven to be very well suited to muffin-blasting (and you think your race cars are a pain to clean?!) it really isn't that good for any serious dirt running. So we won't judge the newer cars by this one, as the five-year old 1/8 off-roader just barely resembles, in appearance as well as function, the current crop of mud-slingers.

To illustrate, there are several featuring four-wheel drive that really work. At least a couple of these cars feature three(!) differential units: one in the middle to split the toque between the front and rear drives; and diffs front and rear, again to split the torque up, only this time between right and left drive wheels. If you are a car nut, the setup is much like that pioneered by Audi, first used in their Quattro rally car, a very serious race car indeed. Today you can even drop in on your local Audi dealer and buy the street version and in the near future it would appear that any number of street-going enthusiast cars will be offered with a knock-off version of Audi's system.

(The whole point of the above, in case you missed it and you certainly cannot be blamed for that as I am presently operating in the "free association" mode, is that we can buy a miniature version of what may be the most radical, definitely the most successful, rally car in existence . . . the full-scale racers have nothing on the model world here.)

And yet 1/8 off-road racing still hasn't taken off. Don't tell me the vehicles aren't available, 'cause they are. Robbe is advertising a couple, I see World Engines important 2WD and 4WD models, and were I to pick up a copy of RCM, I'll bet their all-consuming discy ads would

Continued on page 85

Things get hectic when a motor has to be replaced during a race. Bob Welch (rt.) slips in last hood pin as Jeff Belcher puts on wing.

How do you like that portable official's stand!? Enduro race operator, Ed Hagen, gives Larry Imbeau some "pointed" instructions.

Free Flight Scale

By FERNANDO RAMOS

For the past 32 years, the FLIGHTMASTERS have been synonymous with F/F scale. The past few years the membership has dwindled from 300 plus to a scant 50 or 60. The reason is not totally clear to those of us who still remain active, as to the lack of participation. Granted, we are spread throughout Southern California, but that has pretty much been the case all along. There's no question that the newsletter has been irregular of late, and too often members do not know when various events are taking place.

The first thing I would like to do, is to let those know who read this column, and live in the L.A. area or Orange County, that we meet the fourth Wednesday of each month in Anaheim at Loara High School (Rm 15) at 7:30 p.m. The school is located at 1765 West Cerritos, and we meet September through November, and January through May. In other words, when school is in session. We encourage participation by anyone and everyone who is interested in F/F scale modeling.

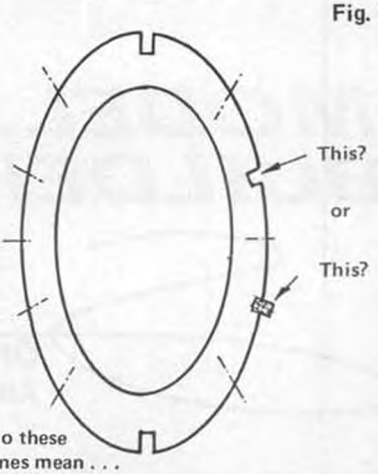
Next, we have changed the format of our newsletter, in that it will once again be mailed out on a regular basis every other month. We have eliminated the strain of letting one person be responsible for nearly everything associated with putting together the newsletter when their turn comes up. Hopefully, this will help revitalize the club into action.

Mid-September, the Flightmasters held their 32nd annual Scale Contest, and personally, I was very disappointed with the number in attendance. This, I know, is due in part to the fact that the event was not publicized at all. Naturally, people aren't going to show up if they do not know when something is happening. In the frustration of trying to get my own models to fly, I did not take a single picture. For this, I apologize to those stalwarts, who through thick and think, attend all of the contests.

However, all was not lost. Saturday evening, after the judging of the models was over, about forty of us attended a banquet, which was a salute to Bob and Sandy Peck, of Peck-Polymers. It was very touching to hear several club members reveal some of the lesser known virtues of these fine two people. All in all, it was an extremely enjoyable evening.

One other bit I would like to share with you, is that Bill Noonan and Bill Hannan have for several years been the weekend guests of my wife and I during the Flightmasters Annual. This year, Warren Shipp also joined us. Let me say, that there is nothing more rewarding than to sit around the breakfast table with these formidable gentlemen and merely chat. During a contest, there is usually very little time to talk with friends. So, those moments one can capture, as previously mentioned, are on the other side of "Contesting" I enjoy most!

Fig. 1



O.K....on the lighter side! Plans, plans, more plans! As I've said before, F/F scale modelers have never had it so good. There is an abundance of excellent plans available, and for the past several months, I have mentioned these plan sources. Another new service is Bell Model Aircraft Co. The two plans I saw are very nice, one being the P-51H Mustang and the other a Spitfire MK-XIV. I especially like the Spitfire, and plan to build this one fairly soon. Both drawings have all the information necessary to build one nice flying model. One service that I would like to see from those who draw up these magnificent plans is to

Continued on page 82

Fig. 4

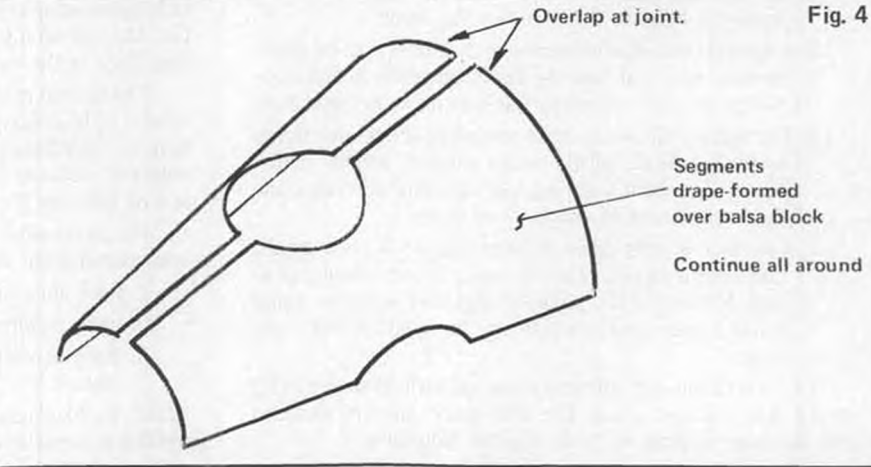


Fig. 2

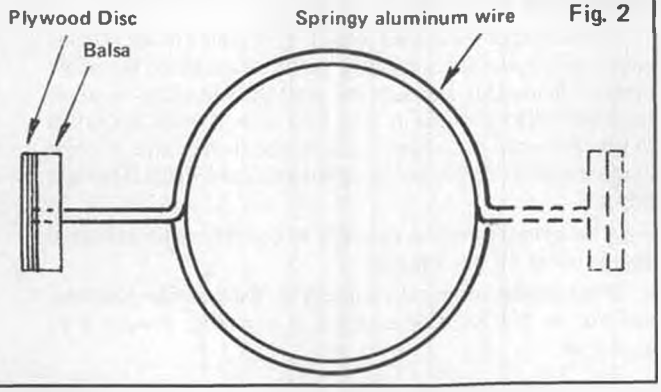
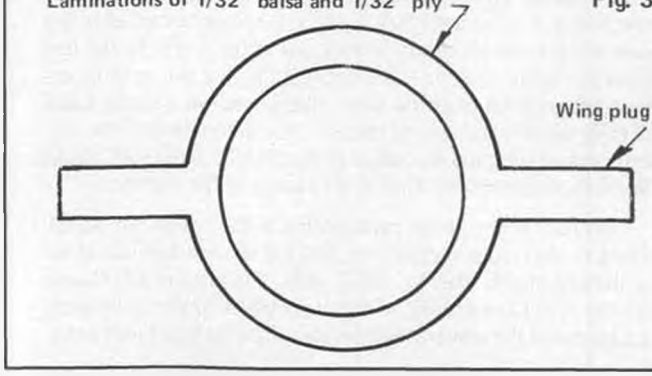


Fig. 3



MODEL BUILDER

Sorrell AIRCRAFT COMPANY, LTD.

WORLD WIDE MODEL HIPERLIGHT POSTAL CONTEST!

Sponsored by Sorrell Aircraft Co., Ltd. & Model Builder Magazine

OVER TWO THOUSAND DOLLARS IN PRIZES — MANY WINNERS!

CONTEST RULES:

Entrants must build a model Hiperlight from the construction article on pages 51 and 52 of the February 1985 issue of *Model Builder*, from which full-size plans are available. Ordering the plans automatically places the entrant on the official registry of eligible participants, and is the only "entry fee" required.

Upon completing the model, entrant must accomplish all of the following four requirements, and mail the results to Model Builder Magazine:

1. Get a Hiperlight model flight, optional R.O.G. or hand-launch, of not less than 20 seconds indoors or less than 30 seconds outdoors. Our required duration time is moderate because this is a Fun Fly event!
2. A second person, whose name and address is to be given, must witness and time the flight, enter the actual duration in seconds, and verify this over his or her signature.
3. The builder will write a brief statement about such things as special details of the model entered; weight, rubber motor data, flight trimming and flight characteristics, and the environment in which it was flown.
4. Have two or more different *black and white* photographs taken of the model, of which one is in static display position. Pictures of the model in flight are welcome. Color prints may be sent in addition to the required black and whites.

The entry form sent with the plans will include spaces to fill out the data requested above. The photographs must be included *with* the entry mailing to *Model Builder Magazine.*

Completed contest entries must be received in the mail at Model Builder's office as soon as possible, obviously, but the contest does not close until May 1, 1985. Entries received after this date will not qualify to win, even if any of them may be the first from an eligible area. In the event that the first two or more entries are received from the same eligible area in a single batch of mail, the first and second places will be determined by the normal random selection procedure of the Model Builder staff. Model Builder's decisions are final in all phases of the contest.

In order to encourage participation in the consts, the $5.00 minimum plan order normally required will be waived on all orders for the Hiperlight, Plan No. 2852, **only.** The price of $3.00 also includes First Class mailing, *of this plan only.* A contest entry form and reprint of the construction article will be included with every Hiperlight plan order.

All initial plan orders and the subsequent return of completed contest entries are to be sent by regular post office mail of the countries involved. Within this framework, special expediting methods, fees or stamps regularly available at the entrants' post office may be used to hasten delivery of the completed entry. *Model Builder* will send the Hiperlight plans only by First Class mail.

PRIZES:

The first entry received from a qualified, eligible area will receive a ten dollar check, U.S. funds, from Sorrell Aircraft Co., Ltd., manufacturers of the Hiperlight. In addition, Sorrell Aircraft Co., Ltd. will send an Award Certificate attesting to the entrants' first place in the event.

The second entry received from a qualified, eligible area will receive a $10 gift certificate toward Model Builder plans, subscription, or Uber Skiver knife products. In addition; *Model Builder* magazine will send an Award Certificate attesting to the entrants' second place in the event.

Places considered as eligible separate areas in which a first and second prize will be awarded are as follows:

1. Each state of the U.S.A., and its possessions
2. Each province of Canada
3. Each recognized country of the world (other than the above).

NOTE: No handicapping for variable mailing distances around the world is required, as each contestant will be competing only against other contestants from his same state, province or country. There could be well over two hundred winners!

At the end of the contest, May 1, 1985, three of the winning entries will be selected as the best, overall Grand Model Hiperlight winners! Remember, although you are only competing on a time basis with other contestants from your area, it is still important to get your entry to us before anyone else in your area in order to win and to be eligible for the additional Grand Model Hiperlight prizes!

The sponsors reserve the right to possibly make additional awards based on other factors.

Photographs become the property of *Model Builder Magazine,* and may be published or exhibited in any other manner at its discretion.

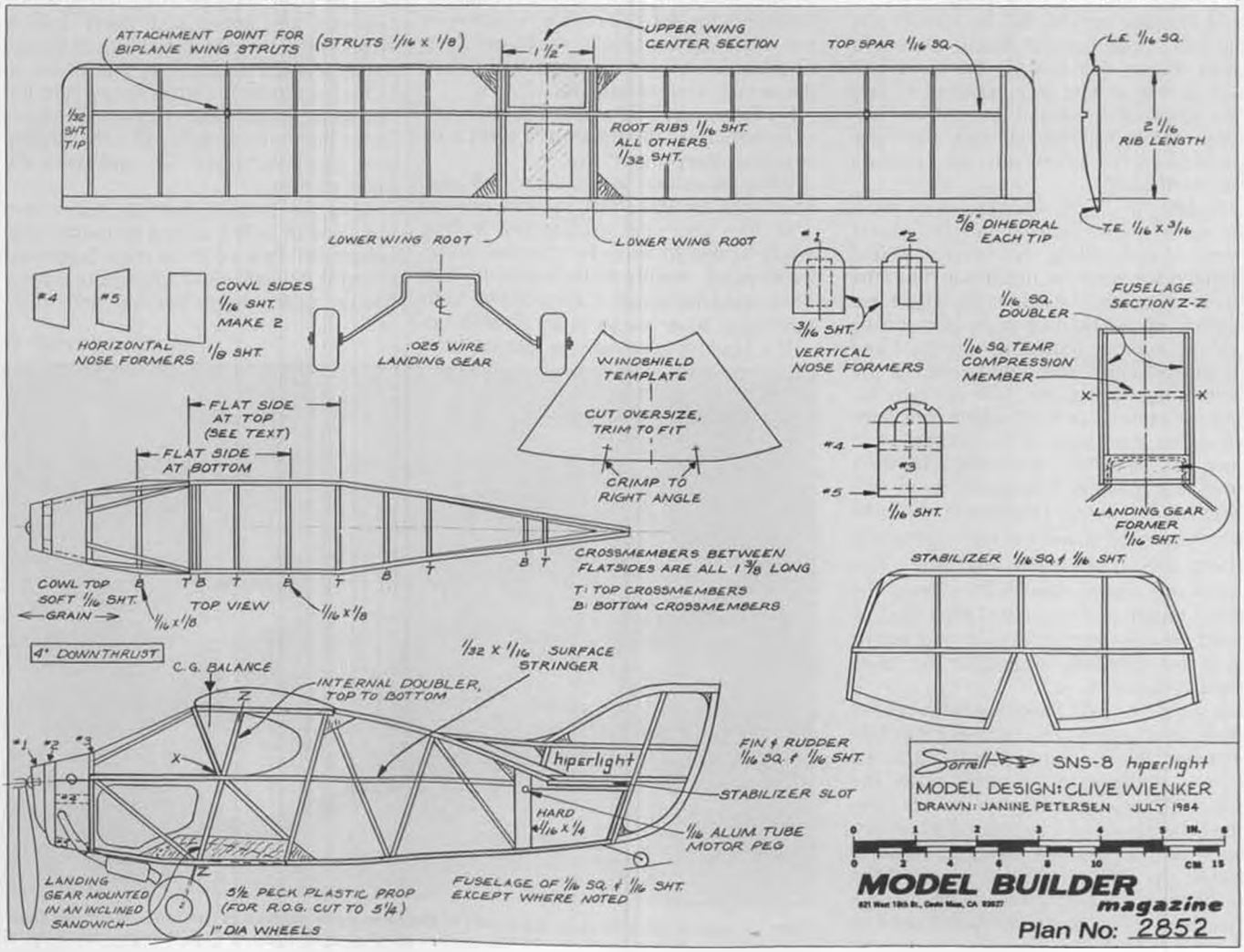
Sorrell hiperlight

By CLIVE WIENKER . . . Build this model Hiperlight and join in the fun of our worldwide postal contest. The pleasing lines of this little biplane should make your fingers itch to start construction. Pass me the uber!

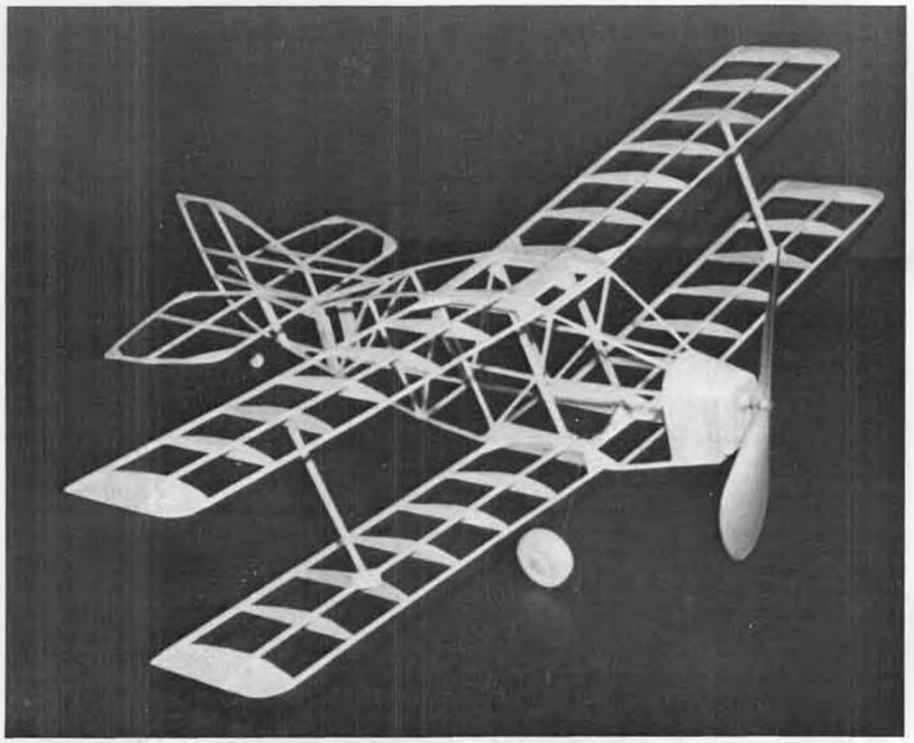
Seeing the Hiperlight at Sorrell Aircraft Co., Ltd's field was not only love at first sight, the universally common reaction to this sleek ultralight, but also the spark that jolted me out of a one-third century hibernation from model design. Voted the "Outstanding New Ultralight Design" at the 1983 Oshkosh Fly-In, the Hiperlight has accumulated so many additional awards that the Sorrell office is beginning to look like Sal Taibi's trophy room.

In the Sorrells' own words, the model flies well and realistically, so let's get on with this authorized semi-scale version intended for the pure fun of sport flying.

Fuselage construction is, as Walt Mooney might say, strictly conventional except for all the unconventional places. Built two sides of firm 1/16 square and 1/16 sheet inlays, one over the other, to insure an accurate match, as the correct wing incidence depends upon fuselage preciseness. Glue together at the tailpost and then add the indicated top and bottom crossmembers. Upper and lower fuselage sides must be flat and parallel between crossmembers that relate to the leading



FULL SIZE PLANS AVAILABLE – SEE PAGE 106



The Hiperlight model shown on these pages was built by Dick Howard, of Lake Havasu City, Arizona. Here we see the assembled "bones". Hope he took it apart to cover it!

and trailing edges of the respective wings. Due to the negative wing stagger, these areas do not coincide vertically and their location is shown on the plan.

At fuselage section Z-Z, be sure to add the 1/16 square internal doublers, the 1/16 sheet former that will be the fixed rear face of the landing gear "sandwich," and the *temporary* internal crosspiece between points X-X that will take the compression forces when you are installing the windshield.

Finish the basic structure with nose former #3 glued between the 1/16 square uprights and adding the two windshield stringers run from the notches in #3 to the upper corners of the cabin. Then the fixed portion of the built-up nose is made by adding, in order, horizontal formers 4 and 5, the two cowl sides (which start at the bottom fuselage line), nose former #2, and the curved cowl top which runs from #3 to the front edge of #2. Immersion in very hot water will make the 1/16 sheet cowl top pliable. Obviously there will have to be some preparatory inclined beveling of the round top nose formers to effect the proper cowling line. The removable nose former #1 carries the thrust button and has a 3/16 thick plug affixed on the rear that keys to and retains it in the matching rectangular cutout in fixed nose former #2.

It should be explained that the propeller drive arrangement in the real Hiperlight dictated the perhaps slightly unusual built-up structure of the model nose. The Rotax 277 engine is inverted and its drive shaft, by means of a belted reduction system, turns a propshaft mounted above it, tucked up closely in the high curved top of the nose cowling. Therefore the model's nose had to be an unobstructed shell at the top in order to maintain the realistic high thrust line. You skilled wood carvers can make the nose from a solid block, suitably hollowed, if you wish. Celluloid should be cemented to the perimeter structures for the cabin side windows in the areas of the pilot's head and feet. Overlaid covering tissue later will define the actual window outlines.

Horizontal and vertical tail surfaces are of conventional 1/16 square and sheet construction. Keep them light.

Wing structures are standard; all outboard ribs are 1/32 sheet, the root ribs are 1/16. Trim and sand leading and trailing edges lightly. To allow for dihedral in the lower wings, slightly tilt the top of the root ribs toward the wingtips. Dihedral for both upper and lower wings is 5/8 at each tip.

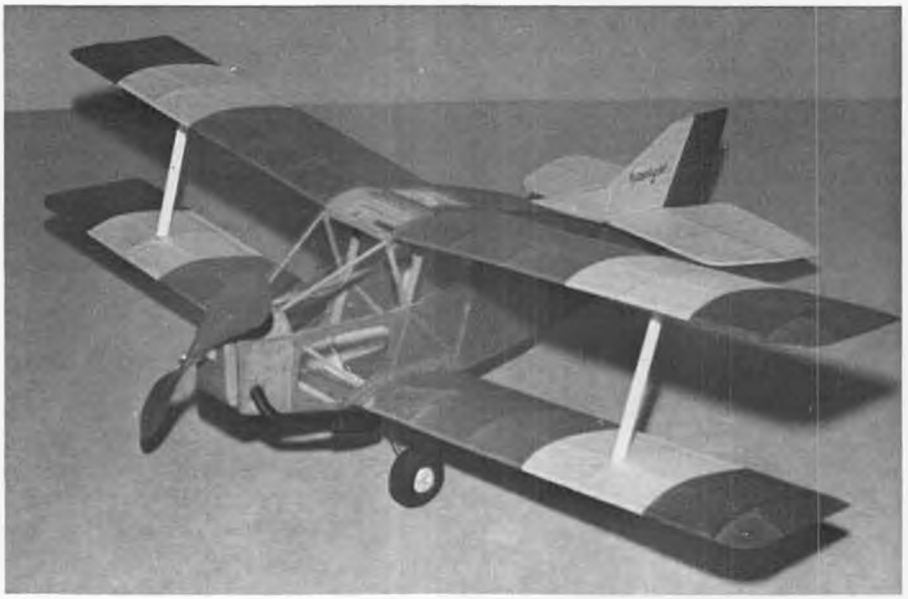
The landing gear may be formed from .025 wire at this point, but note that it will not be glued on, sandwich style, until the lower wings have been attached. Wings, tail surfaces and fuselage are tissue covered, watersprayed and shrunk, and given two coats of well-thinned plasticized dope...less if you have an indoor lightweight in mind. Do not cover the bottom of the fuselage from the landing gear to the nose at this time, as it will facilitate mounting the landing gear and plucking out that temporary fuselage crossmember at point X-X.

Assembly is now begun by placing the fuselage upright on a flat, wax paper protected surface. Hold it in place by weighing it down with something like a box of jello (any flavor) on the cabin top. Scrape the tissue from the areas the root ribs will cover. Glue on the lower wings with the tips blocked up 5/8 for dihedral. The incidence setting is of utmost importance. The trailing edge should rest right on the deck at the bottom of the fuselage and the bottom of the wing at the leading edge should coincide with the top edge of the fuselage longeron at that point. As the longeron in your precisely built structure is slanting upward toward the nose, this leading edge incidence represents a mite more than 1/16 above the base surface, right?

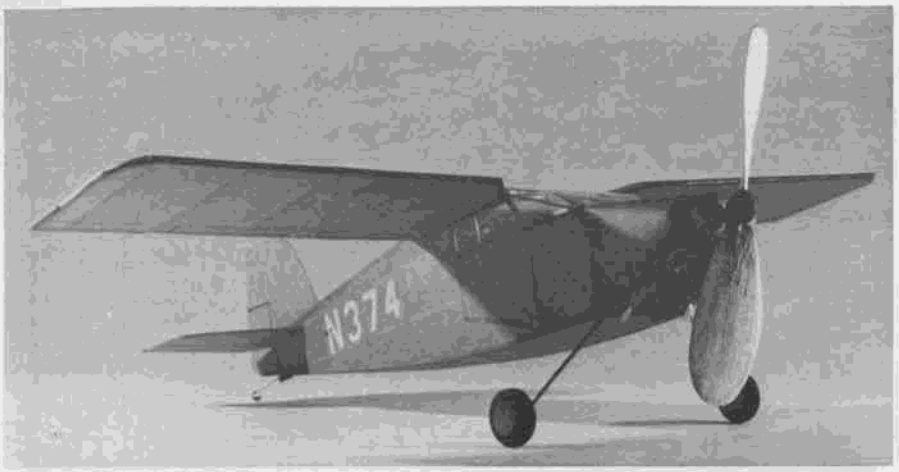
After the upper wing is attached, cut the 1/16 x 1/8 stock wing struts to the proper length by trimming down overlengths until your ruler indicates that the distance between the upper and lower trailing edges is the same from fuselage to tip rib. Make a slight incision in the tissue in order to cement the struts firmly. Add the tail surfaces and your version tailwheel, lining them up carefully; affix the landing gear, pluck out piece X-X, and cover the open section.

Bring the balance point to near where indicated by at first adding temporary clay ballast well forward in the nose. Suggested power is four strands of 1/16 square rubber, twelve inches long, braided and lubri-

Continued on page 95



Wasn't it nice of Dick to cover his model in the same color scheme as the full-size aircraft that appears on the magazine's cover? This airplane just *has* to be done in R/C. Wonder who'll do it?



PEANUT WHITMAN TAILWIND

By SIEGFRIED GLOCKNER . . . Second Peanut to be published by this West German modeler, it's well known and a good flier.

The Wittman Tailwind was designed by Steve Wittman as a fast, two-place cross country aircraft. Its small size enables it to cruise at 150 to 160 mph on 100 hp. Steve got a lot of experience as a racing pilot. The "fat" fuselage and straight lines should not confuse you, concerning the aircraft's performance. Steve knows where to streamline effectively (see also Sport Aviation July 1980, story of "Big X").

The model shows Steve Wittman's own aircraft, as flown in the sixties and seventies. Plans of the Tailwind are offered to the homebuilder market. Dozens of Tailwinds are flying, which proves it to be a well designed aircraft, also one the average homebuilder can construct. I liked the aircraft when I saw the first photos of it in a magazine, and I knew, someday I'd have to build a model of it. With Peanut models it is easy to realize your dream of a certain model aircraft. I built the model after a three-view, published in **Model Builder,** January 1975. The model is easy to build and suitable as a first Peanut to be built from scratch.

FUSELAGE

The fuselage framework and nose section are built separately, and glued together after covering. Build the fuselage sides in the common manner, one side on top of the other. The tailposts go up to the upper longeron, and are cut to length after covering to enable the installation of the stabilizer. The covering is not suspended by a balsa stick above the stabilizer. This makes it easier to change the stabilizer incidence on trimming. Glue the fuselage sides at the tailposts together and join the sides by the means of the cross braces. Note that the lower cross brace F4 at the fuselage front end of the framework is larger than the other cross-braces to install, and take the loads of the landing gear. The diagonal bracing goes from the position of F2 to the front end at the fuselage sides and bottom. On the fuselage top, the diagonal bracing ends behind the cockpit glazing. Fortunately the original has some diagonal bracing in the cockpit area to give a torsionally stiff fuselage.

When the basic framework is assembled, add the covering inside the cockpit. Paint it black before installation. Add the stringers (0.7 square balsa) on the fuselage sides, top and bottom, and the cockpit framing. Join the nose formers N2 and N4 by the two parts N3. Cut N3 a little oversize to make it easier to sand it to the contour of N2 and N4. Cover the nose with 0.4mm thick balsa. The oil cooler and motor cooling air outlet at the bottom of the nose is built from 0.7mm balsa, but not yet installed. Build up the noseplug from N1 and N5, N5 snugly fitting into N2. Sand N1 to the contour of the nose, and cut the openings for cooling air and landing light.

EMPENNAGE

The vertical and horizontal tail is built from 0.7 square and 0.7 thick balsa. The curved balsa parts are bent on a form. Boil the sticks 20 to 30 minutes before bending. There is only one stick, no laminations.

WING

The wing, being of rectangular form, is easy to construct. Cut the root rib W1 a little oversize to help sanding it to a tapered cross-section. Form 12 ribs W2 as a rib block between two plywood ribs to equal shape. Shorten two ribs W2 to get the two ribs W3 afterwards. The wing tip leading edge is cut from 3mm balsa to the planform and glued in place. After the wing has been assembled, and the glue has dried, sand the leading edge, tip leading edge and root rib to shape. The aileron counterweights and position lights are added after covering.

COVERING

Cover all parts with lightweight red tissue. For the wing and tail pre-shrink the tissue on a frame before covering the fragile parts. Do not dope the covering, doping will distort the whole structure.

PROP

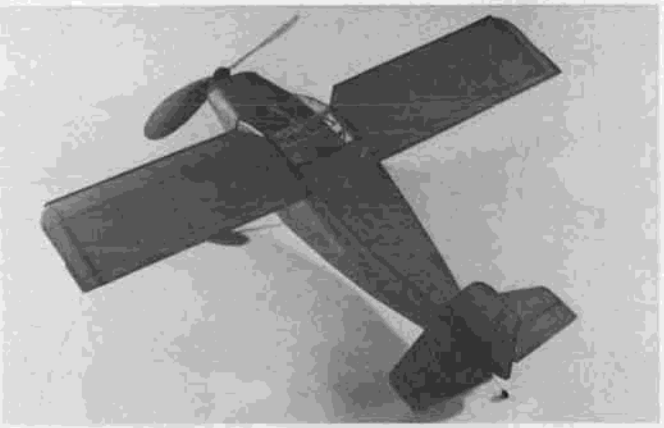
Form the prop blades on a can of approximately 60mm diameter. Cut out the roots to match the stick (toothpick) which joins the blades. I joined the blades to a pitch-to-diameter ratio of 1:4. The propeller bearing is a piece of plastic tubing (RC Bowden-cable inner tubing), heated over a flame and stretched to decrease the inner diameter to match the propshaft.

ASSEMBLY

The covering F6 and the dashboard have to be firmly glued in place. Cut out the tailpost and covering at the fuselage end for stabilizer installation. Paint the cockpit framing light grey. When the paint has dried, take the lightest available

Continued on page 76

Model developed from scale views by Tom Stark in the January '75 issue of MB. Good documentation, as pis of real plane were included.



Nice proportions of Tailwind make it an easy model to trim and fly. Lightweight construction used throughout.

red pos. light

paint black to this line

1,5 □

W4

W5 1,5 □

W3

1 □

W2

W1

wing fixing pin, Ø 0,3 wire

cut W1 to fit to top longerons

Ø 0,3 wire

green pos. light

bracing

W5

Aileron counter weight, make from 1,5 □

Wing, front view

Typical wing section

1,5 □ sand to shape

W3, this length, 2 requ.

W2, 0,5 mm 10 requ.

W5, 1,5 □ section of W3

bracing

strut fixing pin

W1, 2,0 mm

fixing pin location

N3 1 mm

Dihedral: 8 mm

strut fixing pin, Ø 0,3 wire fits into W5

Strut, 1 mm hard Balsa, sand to oval shape

position light, glue in place after covering

sheeting 0,4 Balsa

Alu tubing

F6 Covering 0,4 mm

instrument panel

N1

N2

N3

N4

N5

3,5° side-thrust

central stringer on top only!

0,7 □

these Balsa-Strips on bottom only!

scale stabilizer position

forming prop blades

15°

Ø ≈ 60 mm

epoxy paper washer to fix wheel

strut fixing pin, Ø 0,3 wire fits into F5

Ø 2 Alu tubing

plastic tubing

landing light

5"-hook, Ø 0,3 wire

section through noseblock

N3, location

N2, 1 mm

instrument panel, stiff paper

F3, filler

F2

fixing pin location

F1, 1 mm

1,2 × 1

cockpit framing 4 mm

0,5 × 1

rudder outline

0,5 × 0,7

white pos. light

trim tab location

toothpick

tank filler cap

F6

bl. l. gr.

4° down-thrust

N37L

F4, 2 × 3 mm

F5, gusset

door outline

F2, 1 mm

Ø 0,3 wire

stiff paper

2 mm

wheel hub caps, stiff paper

outer

inner

sheeting

fuselage nose

basic fuselage framing

- colours:
  red: all aircraft
  black: wing L.E., prop hub
  l. blue: "N 37 L" reg. number
  l. grey: prop hub cap, wing strut, landing gear, wheel hub caps, cockpit tubing, instrument panel.
  silver: prop blades

- all wood Balsa, except otherwise noted

- all measurements in millimeters (1 inch = 25.4 mm)

- documentation:
  3-view in 'Model-Builder' Jan. 1975 (excellent!)
  'Sport Aviation' July 1969, p. 44 (colours), p. 62

prop blade, actual size

prop blade, 0,7 hard

landing gear 2nd half

Balsa fairing

F4, 2 × 3

landing gear

scale wheel location

Landing gear, side, front view 0,5 Ø wire

N6, 0,7

N4, 1 mm

N3 location

scale outline

0,7 mm

elevator hinge line

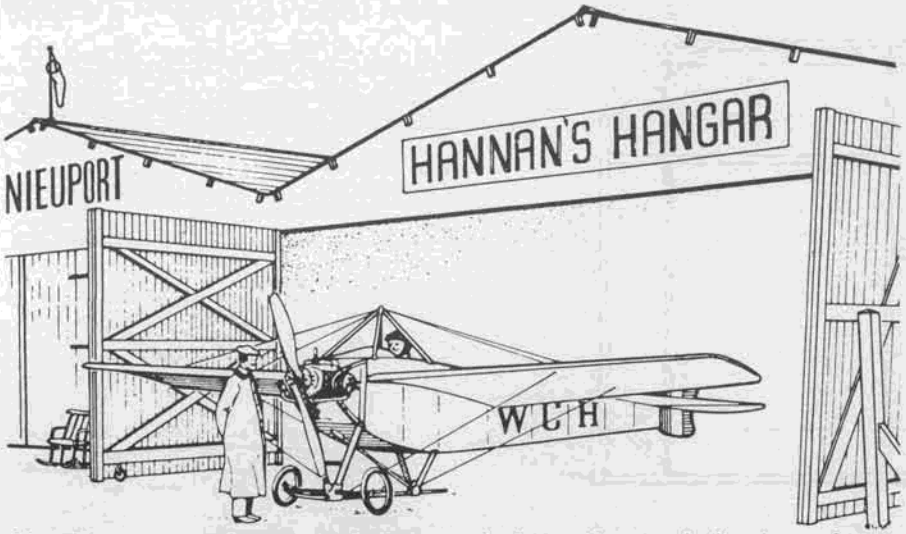
trim tabs on elevator and rudder, make from stiff paper

PEANUT SIZE, STEVE WITTMAN'S

WITTMAN TAILWIND

DESIGNED AND DRAWN BY SIEGFRIED GLÖCKNER

scale: 1:20.77



"It takes two engineers to design an airplane. One to design it, and one to hit him over the head and take it away from him when he's finished."

• This month's lead-in line was by Dutch Kindleberger, of North American Aviation, and was supplied to us by Duane "Duke" Silver, via Ken Hamilton.

QUOTES AND QUIPS

Many letters to the Hangar contain profound thoughts, philosophical insight, or just plain good humor, and here are a few examples:

"Beware when you start a Pistachio model...like Peanuts, you can't stop at just one." Dr. John Martin, Florida. But Bill Warner, of California has this response to Pistachios: "The little darlings are too small for me. I have a hard time getting a regular size model, whatever that is, to stay up much more than thirty seconds (unless it's a Lacey or some such cheatie-cheatie configuration)."

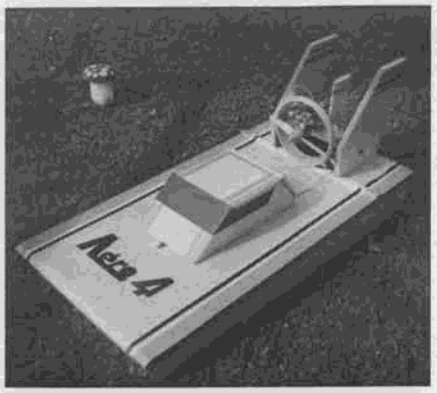
Regarding our hobby, Dick Johnson, of Texas asks: "Where else can a craftsman take a few pieces of material, massage them for endless hours, create a visual delight...and destroy it in a moment, or have it disappear forever?"

And about his scrapbox Dick wonders: "Is there really any chance of using that 3/4-inch long piece of 1/16 square? Why do I still have print wood from some ages-old Cleveland kit? If we keep scrap balsa to use at some future time, why doesn't the pile ever get smaller?"

Perhaps the most common lament among modelers concerns the shortage of spare hours: "Gee time flies, or is it that we are going through it faster?" Herb Kelley, California. Al Backstrum, of Texas, agrees: "...hopefully I will have some time soon to do some modeling. I can always seem to find ten things more I want to do than I have time for." Pete Baker, of Wisconsin, takes the direct approach: "I can't wait for (work) things to get done so I can do some heavy-duty modeling again. Sometimes you just have to stop with the every-day things, sit down and do something for yourself. Well today is the day."

MORE REFLECTIONS

After visiting the famous Shuttleworth collection of flyable antique aircraft in England, David Deadman writes: "...one of the pleasures of old aeroplanes is their sound, and at these quiet evening displays, the Old Warden Aerodrome staff try to have only one engine running at a time, so that you get all the pleasure of the engine start, through the flight, to landing, without overlaps. This doubles the joy for all involved, and I was reminded of this when I went to fly my vintage models the next day. On the busy flight line of the club field, you can't hear your own engine properly, and it is difficult to relax and really *watch* your own model. You have to watch out for the other models as well. I am sure this is why I enjoy flying most of all when it is with a small group of like-minded enthusiasts who join with you to watch your flight, while you can enjoy theirs when they fly."



R/C "Airoglisseur" hovercraft by Georges Chaulet, of France, uses 50% of engine power for lift, and 50% for propulsion. No skirt required, .60 cu in engine, one meter long.

Percival Mew Gull, CO_2 powered free flight by David Deadman, of England. Has twin fuel tanks, slightly enlarged tail surfaces, weighs appoximately 2-3/4 ounces.

Dennis Norman with his awesome rubber-powered Avro Lancaster. All props are powered, and model has exceeded 30 secs. Scott photo.

Larry Kruse placed fourth at the '84 Nats with this 3/4-ounce, 22-1/2 inch span rubber-powered Dalotel DM-165.

PRIZES FOR PAPER PLANE PILOTS

Tom Houle and Dave Gibson forwarded an article from *Minnesota* magazine, describing a paper plane contest benefiting charity. Billed as the Great Airplane Toss, the event was held in a stadium right after a baseball game. An estimated 15,000 people paid half a dollar apiece for chances to launch paper darts from the bleachers toward targets on the playing field. Among the twenty-three sponsored prizes was a $41,000 Mercedes-Benz automobile with its run-roof open as the grand prize target.

Although some 80,000 paper planes were lofted to win about $30,000 in merchandise, no one was able to claim the Mercedes. A pity. Better luck next year!

PRE-WAR READY-TO-FLYS

Ken McDonough, of England, responded to our photo of the Japanese silk-and-wire "dime store" model with this recollection: "About the same time, the Japanese produced catapult gliders finished in the markings of the Ryan, New York to Paris "Spirit of St. Louis," and the Paris to New York "Point d'Interrogation" Breguet. These gliders were superb flyers, and would perform a couple of loops, stall, and then a long, flat glide. Of all-wood (but not balsa) construction, they cost a shilling (about 35 cents) and were well worth it." Anyone in our audience still have one? We'd be pleased to publish a photo.

MORE MEMORABILIA

Gerald Myers favored us with a newspaper account about an auction of over 800 aeronautical toys and artifacts from the collection of Dr. Donald Z. Sokol, "The Red Baron of Pottstown," which was expected to attract about $250,000. Among the items were cast-iron Zeppelins, clockwork-driven aircraft, original "Smilin' Jack" comic strip art, stewardess paper dolls, letters written by the Wright brothers, Charles Lindbergh, and Amelia Earhart.

Most of us have at least small collections of aeronautica. Obviously they are growing in value and deserve preservation and care. Today's toys are tomorrow's treasures...

AERO LITERATURE

Speaking of collecting, our mail suggests that out-of-print books and magazines are in constant demand among model builders. One good source we have found for such publications is: *Aero Literature*, P.O. Box 1441, Olympia, WA 98507. A dollar bill will bring you their catalog, chock-full of reasonably priced offerings.

George Townson, veteran autogiro pilot and author of a soon-to-be-published book on the subject, examines the Hangar's Avro/Cierva C.17 model.

VIDEO TAPES TOO

If you prefer to spend your time in front of the TV instead of immersed in books, you can still attend to research: *The Moors Aeroplane Factory Inc.*, 1468 N. Larkwood Square, Ft. Myers, Florida, 33907, offers video tapes on such subjects as: Old Rhinebeck Aerodrome, Building Models For Museums, Building Full-Size Dummy Aircraft Engines, and building various museum-quality models including an SE-5a, DH-4, Sikorsky S-35, Curtiss Jenny, Nieuport 28, and a Lilienthal glider. One dollar will fetch a complete catalog, which also offers useful tips on photographing your own models.

SPEAKING OF VIDEO TAPES

Daniel Walton, of Kansas, has tried a novel approach to sending proxy-flying instructions: Employing a home video camera, he carefully *showed* the important features of his models. With this system, such things as launch techniques and critical adjustments can be demonstrated with utmost clarity. Those not owning video equipment might still employ this method, utilizing low-cost rental equipment.

NOSE JOB

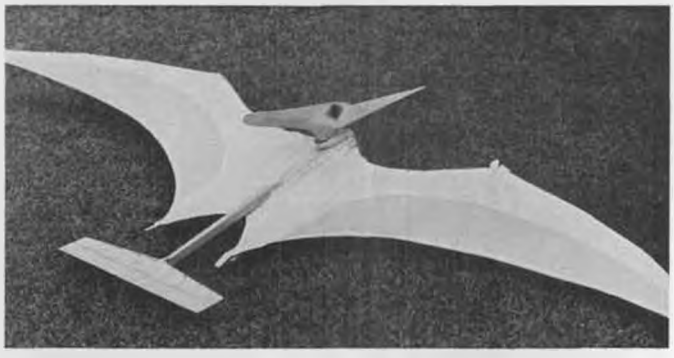
From Ralph Scott, Sacramento, California, comes this unusual tip: On rubber-powered models there is usually some difficulty in obtaining the ideal fit for noseblocks, i.e. snug enough not to fall out in flight, yet free enough to be easily removable for winding. Ralph suggests: "...it measures OK, the angles are precise, you have checked for excess glue globs and you have slightly rounded the sharp corners with sandpaper. Now for the tilt-test; the top goes into the opening OK. Also the bottom and the two sides. But can it be squarely inserted into the fuselage? No way! There is absolutely no reason why it won't go in...except friction.

"So where's the sandpaper? Forget it... before you sand away too much. Don't sand it, LUBRICATE it! Dust the mating surfaces with talcum powder and try again. This idea has saved me a lot of over-sanding and frustration, and contributes to longer wear as well."

SWAMP SQUADRON NEWS

Dean McGinnes has organized a Florida branch of the Flying Aces Club, and now offers a newsletter subscription

Continued on page 88



Pterodactyl with a modern stab is R/C model built by Hewitt Phillips several years ago. Stab for testing purposes only.

F/F Scale columnist Fernando Ramos launching his rubber-powered Arado during 1980 Flying Aces Nats, Wright-Pat AFB. T. Schmitt pic.

Control Line

By MIKE HAZEL

PHOTOS BY THE AUTHOR

• A few issues ago, we covered basic CL fuel tank operation, class 101. Now it is time to go to the "lab," and build a tank for practical experience. Before we just start bending up tin sheet, let's first determine what the exact requirements might be.

The most obvious one will be the actual fuel capacity. If the tank is to be used for general non-competitive, round-and-round type action, then the choice is pretty wide open. If the tank is to be used in a competition ship, then sizing becomes somewhat important for most applications. For stunt flying, you need enough juice to run through all the maneuvers, and yet not go over the rule book time limit.

In most racing events, where a fuel shutoff is employed, exact capacity is less critical. Tanks are normally oversized to allow for pitting strategy. Obviously the tank cannot be too small, as this would incur extra pit stops.

In some sport racing type events, fuel shutoffs are not allowed, so the capacity again becomes critical. Whatever the application will be, chances are that you know by the ounce (or cc) what the capacity requirement is by prior experience.

Another major consideration is the physical size. For most profile fuselages, this is not very critical. However, for a built up fuselage, the tank must fit into the allocated tank space (my profound statement for the month!).

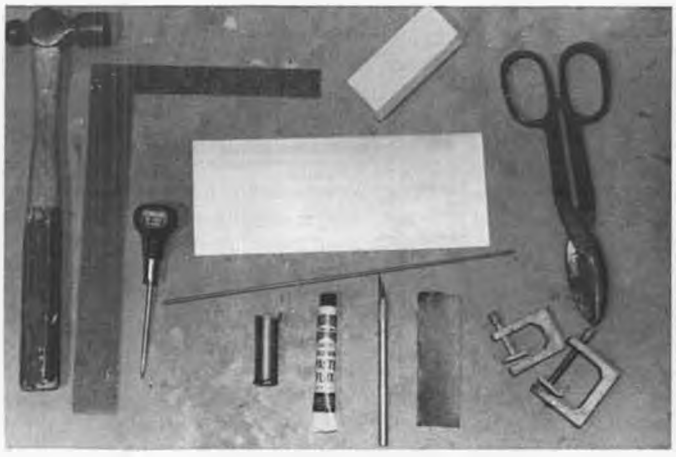
Also remember to consider the plumbing orientation. The vents and feed lines should be directed so as to avoid tight bends in the fuel line, which may kink. You will also want the fill tube(s) in a convenient location, and not interfering with any structural members.

The formula with which to determine capacity in ounces is: Cubic inches divided by 1.8. For square type tanks, this is easy to figure. For cylindrical or other odd shapes, refer to the appendix in your physics textbook.

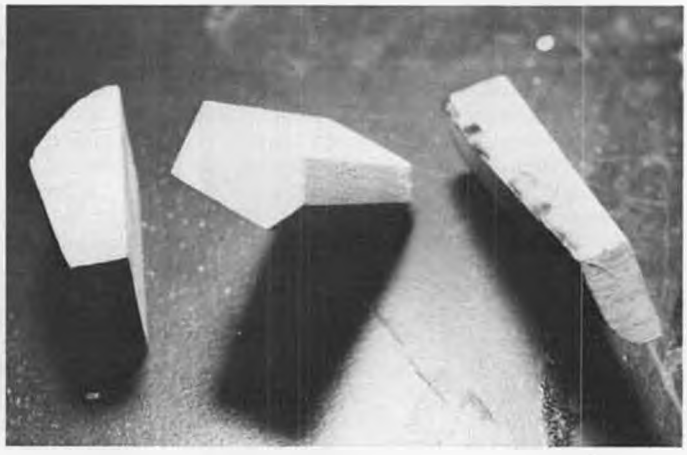
For really odd compound curve shapes, I use another method to calculate the capacity. Referring to the photo, a wooden blank of the tank size is immersed in water in a graduated cylinder. Simply take the difference between the before and after measurements to get the capacity.

The example shown is a pattern that I used to make a tank for a class D speed plane. The tank is flat on one side, but curved with a taper on the other side, to fit the countour of the speed pan. In this application I knew that 60 or 70 cc capacity was necessary. I cut and shaped the pattern to guesstimated size, and it came out slightly over-size. With one more cut and check, a pattern was had that would otherwise be difficult to accurately measure. The use of a wood block pattern is certainly not a necessity to form a simple tank, but is a personal preference.

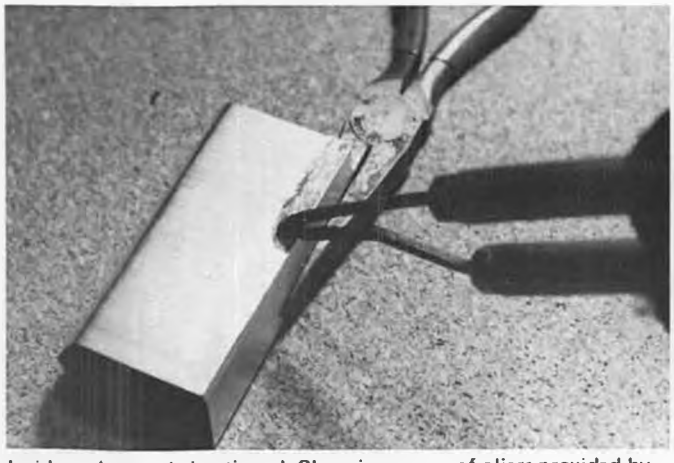
Now let's get down to some construction. First cut out a wood blank for a pat-



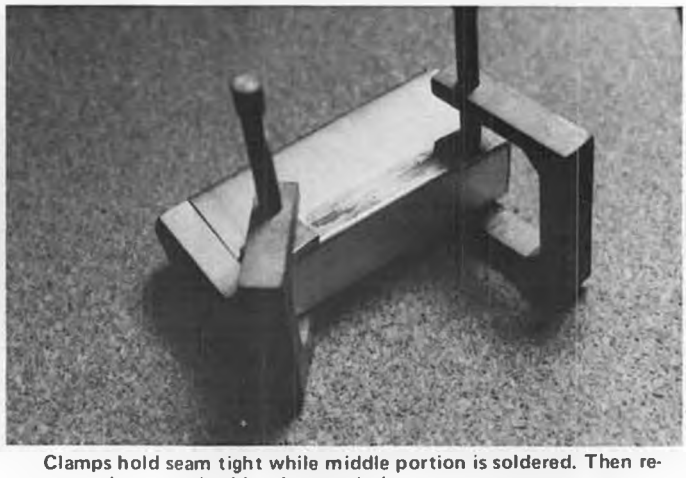
Most of the items needed to "build" a brass fuel tank. Stock tanks don't always fit the original design you created.



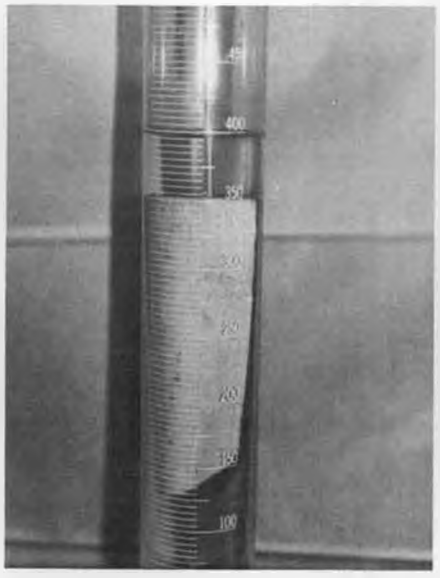
Three examples of wooden tank patterns. Center one is used to make the tank in this article demonstration.



Inside tank seam being tinned. Clamping power of pliers provided by rubber band wrapped around handles (out of picture).



Clamps hold seam tight while middle portion is soldered. Then remove clamps and solder the remainder.



Odd shaped tank pattern submerged in graduated container to check capaity displacement.

tern, after having determined the appropriate dimensions.

The finished tank that is pictured was built from .010 sheet brass, 1/8-inch O.D. brass tubing, has a capacity of 3½ ounces, and incorporates uniflow venting.

Referring to photo Number One, you will see a layout of most of the tools necessary to build the tank.

Step One. With the scratch awl, mark the metal stock to size that will make an open-ended box. Go ahead and cut the dimension necessary that will determine the length of the tank. Now we start bending.

The technique that I use is to start the bend over the wood pattern, but to finish it with a metal straight edge, such as the square pictured. Both can be used together to get an even, smooth bend. The first bend that I make is the top outboard one, which forms the wedge.

Continue making the bends all the way around. The seam will be the top inboard corner. Cut off the excess stock to allow about a 1/4-inch overlap for the seam. You will find it easier to bend up the tank body if you do not cut the excess material first. This allows you some extra stock to grip when making the final bend.

Step Two. Prepare the tank body seam for soldering, by using fine sandpaper on the surfaces that will be joined. Referring to photo Number Two, the inside surface of the seam is being tinned. In photo Number Three, the tank body is being held square and steady by use of clamps and the wood pattern. This also ensures a solid, tight solder joint. The center area between the clamps is soldered first, followed by the outer ends with the clamps removed.

Step Three. Next the end caps are formed. With the wood block inserted in the tank body, use the scratch awl to mark the outline of the tank end on the metal sheet stock. Cut out this shape, allowing about an 1/8-inch extra which will be bent over. In photo Number Four, a wide nosed pair of square-jawed pliers are used to bend the little tabs on the end caps. Note the

Tabs on end clamps being formed with flat-billed pliers.

little angled notches that are cut. Make both the front and rear caps at this time.

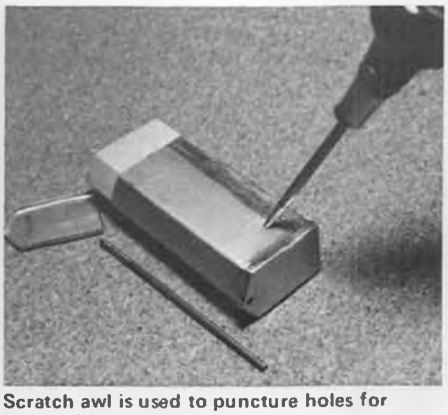
The hammer is sometimes used to "persuade" some of the fine dimensions of the end cap to get in line. This is only done with the cap on the tank body with the wood block in place to prevent crushing the body. Tap gently!

Step Four. The front end cap is soldered in place. Remember to prep the tank body as before.

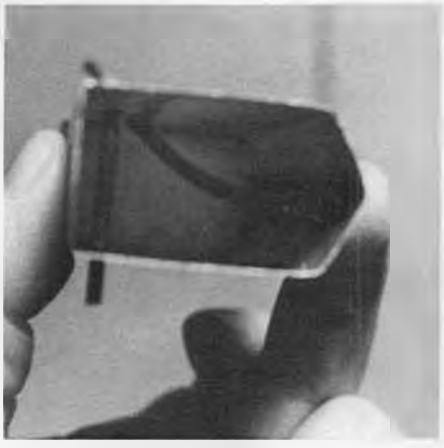
Step Five. Referring to photo Number Five, the tank is punctured to receive the brass tubing. The block inserted into the tank body will prevent any undue crushing or twisting while the scratch awl makes the puncture. Be careful not to make the holes any larger than is necessary for the brass tubing to pass through tightly.

Step Six. Install the brass tubing, and solder in place. Here are some tips that will help with this step. To cut the tubing, simply roll it on a flat surface with a model knife, scoring it. If the tubing must be bent sharply, this will be accomplished more easily by annealing it. To do this, apply a torch flame to the tubing until it is cherry red, and then let it air cool. It will then bend quite easily. Again, before soldering, use the sandpaper on all surfaces that will be joined.

Photo Number Six shows the tubing



Scratch awl is used to puncture holes for brass tubing.

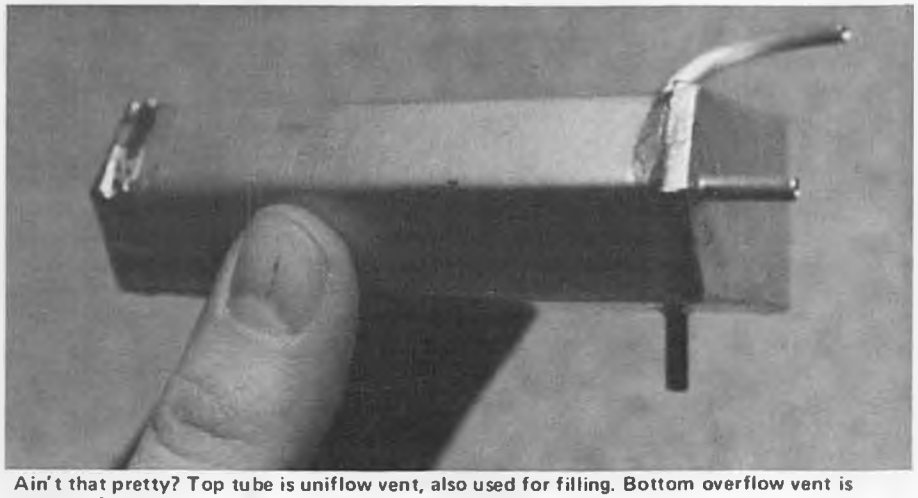


All tubing soldered in place. Note positioning of vents.

soldered in place. The fuel pickup is at the height of the wedge, about 3/8 inch from the back. The uniflow vent is just slightly below the fuel pickup, and about a 1/4 inch ahead. This tank will be filled through the uniflow vent. Note that the overflow vent goes to the top of the tank. The photo is probably not clear enough to show that the top of the vent is angled, so that it may touch the roof. Remember that the overflow vent is capped off before flight, otherwise the uniflow vent will not function properly.

Step Seven. This is very basic, but very important. Next the inside of the tank

Continued on page 78



Ain't that pretty? Top tube is uniflow vent, also used for filling. Bottom overflow vent is capped after filling.

Doug Joyce, the canard specialist, wipes the Rossi sludge from his FAI power ship. We presented a 1/2A version some years ago.

Bob Sifleet (right) and Gil Morris survey the scene and wait for the perfect time to launch at Seguin.

Free Flight

By BOB STALICK

THE DEMISE OF CELLULOSE CEMENTS

I guess I never thought about it much when I was mixing my two-part epoxies and firmly installing the firewall on my latest gas ship with this modern miracle. Even when I was thinning out some aliphatic resin and using it for planking the leading edges of the wing, I didn't recall those wonderous days of yesteryear. Of course, that blankety-blank Hot Stuff nozzle causes me no end of grief, but the adhesive inside is so wonderful, that I can build my entire wing structure in a matter of minutes. Strength and quickness are something I take for granted in my contemporary model building experiences. I suppose that if I ever got hooked using iron-on coverings, I would feel the same way about nitrate dope and silk or tissue. Fortunately, I still revere this old system.

It wasn't until recently that I bought a tube of Ambroid . . . it had been awhile. In fact, the price has raised considerably from the 25¢-a-tube days. In truth, I bought the next smaller tube because I only had a dollar with me on this occasion.

So why buy Ambroid these days? Well, I figured that a good nostalgia model deserved a little bit of nostalgic adhesive . . . not in critical places, mind you, but a little here and there would certainly be ok, I figured. It was only after I glued on the tip blocks using the Ambroid that I realized why I heralded the advent of the super glues. It was that little amber line that remained no matter how much I sanded that did it . . . that, and the fact that even after a 12-hour drying period, the joint wasn't strong enough to withstand a healthy dose of sanding block. I have to admit that I didn't double-coat the joint as indicated on the directions, but then again, I didn't do that back in the good old days either.

Then, after the session in the shop and after returning to the livingroom, I suddenly understood why I had missed Ambroid. It wasn't the superior adhesive qualities which the new adhesives far surpass; it wasn't the speed of drying, either; no, it wasn't the color or anything like that; what it was that I missed was chewing the glue off my fingers! It's only Ambroid (and to be fair, the other cellulose glues) that does it. The super glues are poor seconds to this nostalgic activity. In the years that have passed since my last tube of Ambroid until now, I had forgotten what I missed about Ambroid. I have rediscovered one of the paramount joys of my youth. I can chew the Ambroid off my fingers again. The ecstacy is back. I will never again be without a tube of trusty Ambroid . . . no matter the cost. It's the chewing of glue off one's fingers that is the true nostalgia . . . long may it live!

Our *Free Flight* editor with his "Ringer", the subject in this month's three-view. Taken at Harts Lake Prairie. Photo by Barbara Stalick.

FEBRUARY MYSTERY MODEL

So, here is a true insider's mystery model. This one appeared in a 1954 national publication and was powered by a Jetex 50 engine. Of course, it was a free flight . . . and definitely an oddity. Truthfully, this ship is such a trick answer that I wouldn't be surprised if no one tried to respond. However, the winner will be chosen by the first postmarked correct answer (using a complicated formula to provide for longer distances) sent to Bill Northrop at Model Builder. And the winner receives a year's subscription to Model Builder as a prize . . . worth the effort, right? Do it now!

DECEMBER MYSTERY MODEL . . . wch

The last Mystery Model for 1984 brought about the darndest coincidence. When "The Unknown Modeler" brought in his report (well now you know he doesn't live far away!) on the '84 Reno Nats, he included among the photos a portrait of himself, complete with the appropriate paper bag over his head, and holding a 1/2-free-flight model.

As we were laying out the various articles for the December issue, it suddenly clicked. The December Mystery Model drawing that Bob Stalick sent in with his F/F column and the 1/2A model in the Unknown Modeler's hand were one and the same design! It was truthfully about the time the caption was being written that the coincidence came to life. The caption practically wrote itself! A chance of that happening again is about as remote as seeing this month's Mystery Model flying away in a thermal. How about a million to one!

Anyway, whether the photo helped or not, the earliest correct identification of the "Half Wild Goose," designed by Ted and Mary Samuleson of Utah, came from Eugene Bartel, of Albany, Oregon.

FEBRUARY THREE-VIEW: THE RINGER 1/2A

One of the impressions that I came home with from the Reno Nats was that most of the winners in 1/2A Gas were flying larger models. Sal Taibi was flying an Orbiteer, Randy Archer was flying a big Satellite, Phil Hainer was flying his Air Express 330. Remember, this was a Cat. II contest . . . three-minute maximums and nine-second engine runs. So, what were these guys doing with their 330 or so "squinch" ships? They were winning.

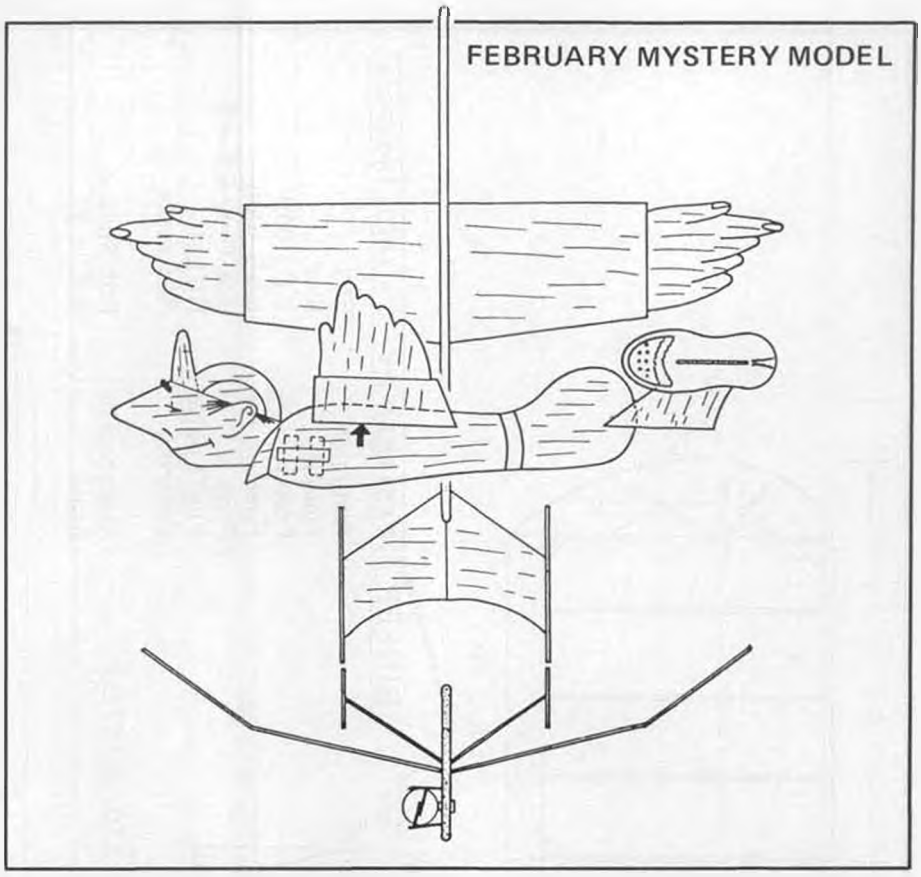
Well, sezz I, what ships do I have in the old plans collection that are in the same neighborhood . . . 350 squares or so. Orbiteer, a kit Starduster 350 (kind of an Orbiteer with high thrust), a Tempest 370 . . . this one was tempting. But, there it was, lurking near the bottom of the box . . . the Ringer by Red Thompson. Then came the search for the missing magazine article . . . the July 1966 edition of Model Airplane News. Sure enough. Red says he can build two in a weekend. I figure that I have a month before the last contest of the season here in the NW. Sure enough, it builds fast. Up to the Autumn Thrash . . . the last contest of the season. Trim it out in about five flights. Major changes include a little left thrust and reduced wing incidence. Take out the shim for right glide, because it wants to glide left. A little left stab tilt does the trick. Three flights later, a first place win in 1/2A gas! The last flight is a flyaway with the d.t. line wrapped over the stab so that it has an angle of about 10° or so . . . just enough to make it climb ever higher at the top of each stall. Away forever into the NW forrests. Sure, my name was on it . . . if anyone finds it.

So, now I have to build another one. As of the writing of this article, all the parts are cut out. I figure I've got three months before the first meet of the new season. I should finish it in time. I like the ship . . . it's a dandy. If you are looking for a good flying easily trimmed competitive big 1/2A, give this one a second look.

FEBRUARY DGA . . . THE RINGER

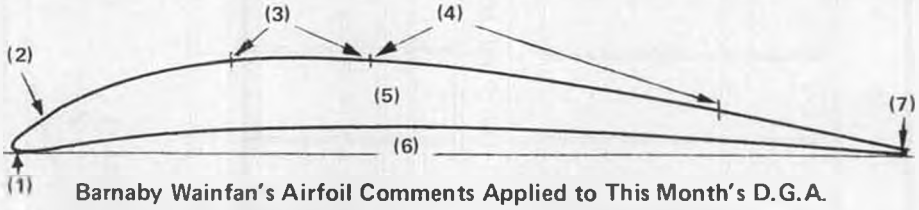
This month's airfoil is the one that Red Thompson used on his 1/2A power model. It is a section that looks more suited to an A-2 or similar all-out duration type ship rather than on a 1/2A gas ship. With an overall thickness of just at 8%, but a tip camber thickness of 10.83%, it is definitely a gliding section. It is, however, an excellent gas model section, especially when used with a 7% or thinner stabilizer. The climb speed isn't the same as the thin flat bottomed sections, but the glide is excellent.

I would think that this one would be worth trying on a glider or any model that has a higher wing loading.



THE DESIGN OF FREE FLIGHT AIRFOILS FOR MINIMUM SINK, by Barnaby Wainfan

One of the presentations at the NFFS Symposium at Reno really caught my im-

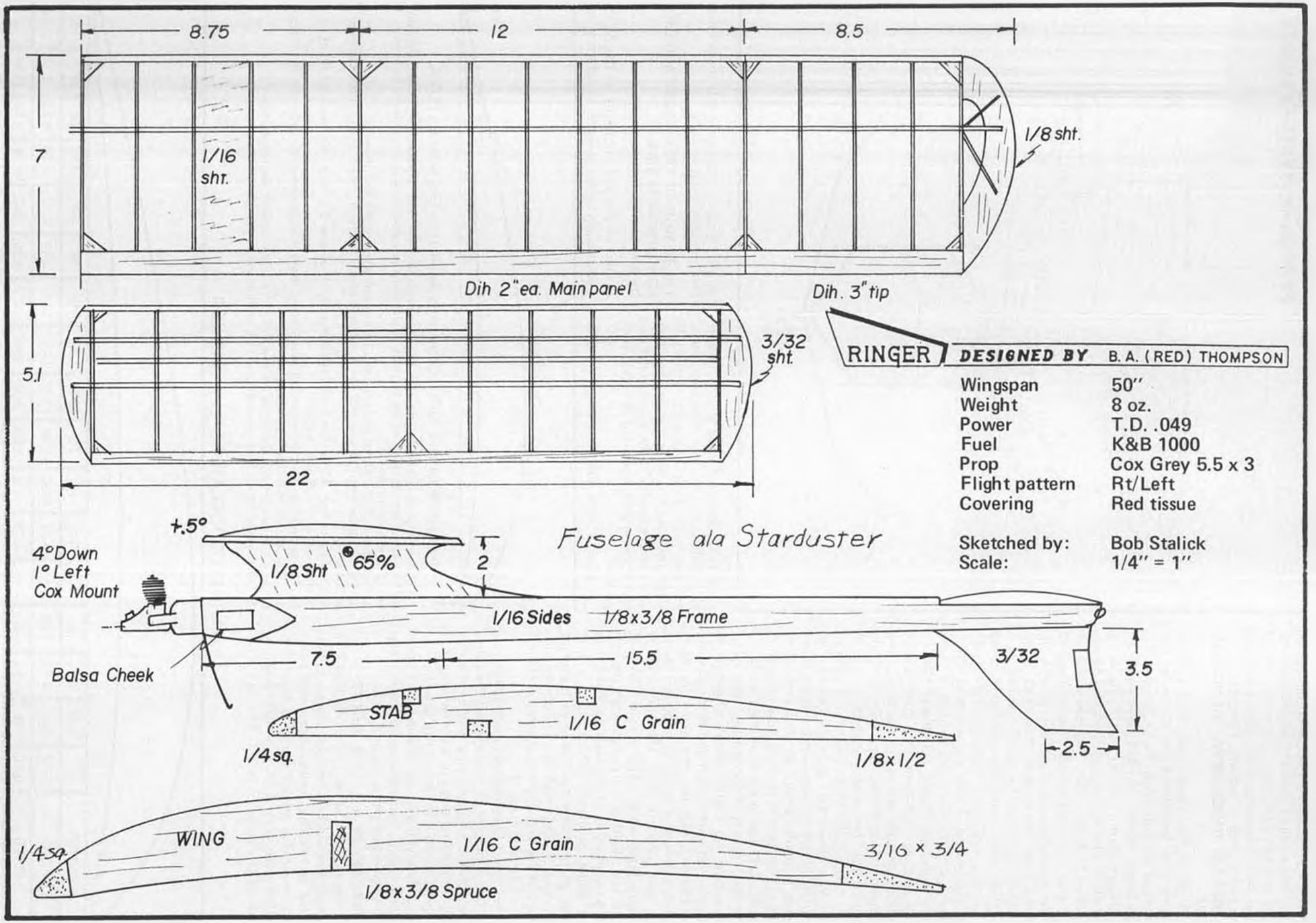


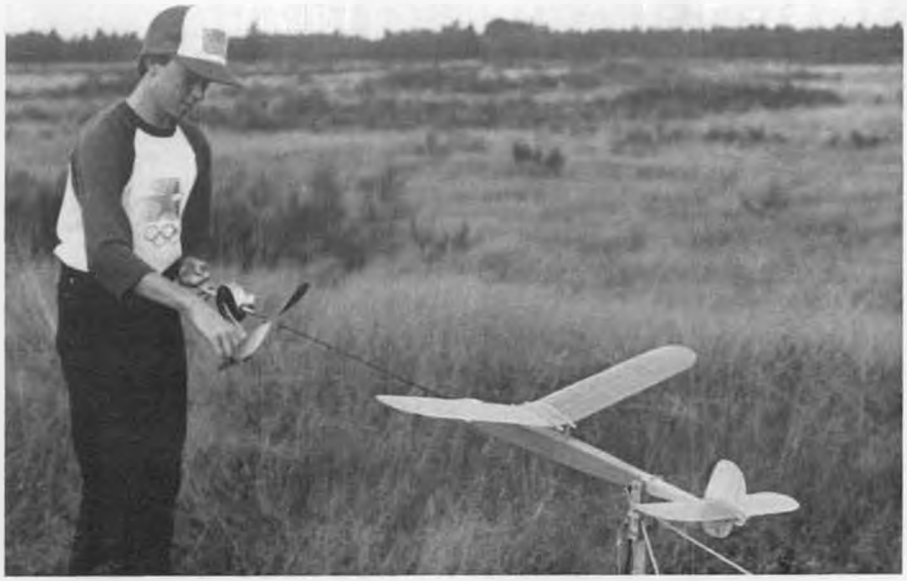
Barnaby Wainfan's Airfoil Comments Applied to This Month's D.G.A.

1. Leading edge radius should be near 1%. This example meets the requirement, except that the airfoil has a slight upsweep at the bottom. It would be better if it were right on the bottom line . . . with no upsweep.
2. Flat spot at 2-3% behind leading edge. This example meets the requirement.
3. High point between 25 and 40%. This example meets the requirement with the high point at 35%.
4. The Eppler test: Airfoil has a trailing edge drop-off of over 5%, so it fails the Eppler test, as its drop-off is 6%. (Picky - picky!)
5. Thin as possible: This airfoil is well over 9% and more than in necessary to handle the structure. The section fails this requirement.
6. Undercamber follows the mean camber line: This section meets the requirement.
7. Trailing edge at 1% with sharp edges. This section meets the requirement.

DARNED GOOD AIRFOIL — RINGER

STATION	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	100
UPPER	0.80	2.20	3.33	5.00	—	7.77	8.88	10.00	10.55	10.83	10.50	9.44	8.33	3.94	4.83	2.72	0.83
LOWER	0.20	-0-	-0-	-0-	—	1.05	1.55	2.20	2.33	2.66	2.77	2.50	2.22	1.94	1.11	0.55	-0-


8.75
12
8.5
7
1/16 sht.
1/8 sht.
Dih 2" ea. Main panel
Dih. 3" tip
5.1
3/32 sht.
22
RINGER
DESIGNED BY B. A. (RED) THOMPSON
Wingspan 50"
Weight 8 oz.
Power T.D. .049
Fuel K&B 1000
Prop Cox Grey 5.5 x 3
Flight pattern Rt/Left
Covering Red tissue
Sketched by: Bob Stalick
Scale: 1/4" = 1"
Fuselage ala Starduster
+.5°
4° Down
1° Left
Cox Mount
1/8 Sht
65%
2
1/16 Sides
1/8x3/8 Frame
Balsa Cheek
7.5
15.5
3/32
3.5
2.5
STAB
1/16 C Grain
1/4 sq.
1/8x1/2
WING
1/4 sq.
1/16 C Grain
3/16 x 3/4
1/8x3/8 Spruce



Chris Beattie, of Vancouver, B.C., shows how to wind up a Flite Rite P-30. Harts Lake is the site. Just look at all that cushiony tall grass! Photo by Barbara Stalick.

agination. It was Barnaby Wainfan's description of what makes a high duration model airfoil. For the non-theoretical types like me, his brief presentation gave me insights that I hadn't know before. If you are interested in the full presentation, you should send $10 off to NFFS Publications, c/o Fred Terzian, 4858 Moorpark AV. San Jose, CA 95129. Of course, more than Wainfan's article is in this year's Symposium Publication, but his article is worth the $10 alone.

I have taken the liberty of paraphrasing Wainfan's major points, and using the February DGA as an illustration. I have noted on this airfoil sample just where each of his major points appears. So, on to those major points:

- LEADING EDGE RADIUS: the radius should be as small as possible . . . 1% is nearly double the performance of the airfoil over a 3% radius.
- LEADING EDGE BEHIND THE POINT: a leading edge flat spot directly behind the l.e. radius at the 2 to 3% location improves turbulation.
- POSITION OF THE HIGH POINT: High point should be between 25% and 40% of the airfoil . . . with some improvement noted the closer to 40%.
- THE EPPLER TEST: Airfoils should not drop off more than 5% between the 40% and 80% positions, thereby reducing trailing edge separation.
- TRAILING EDGE THICKNESS: The thickness at the trailing edge should be in the neighborhood of 1% and be perfectly sharp to decrease drag.
- EFFECT OF THICKNESS: The airfoil should be as thin as possible, still allowing room for adequate structural considerations, 9% appears to be the maximum.
- UNDERCAMBER: (not detailed in the article but covered in the oral presentation) Undercamber improves duration as long as it follows the mean camber line. (see sketch for illustration).

I would like to note that the full article explains in more detail the highlights mentioned above. These statements apply mainly to models where glide is the paramount consideration.

DIXIELANDER PLANS

I inadvertently uncovered a great deal of interest recently when I provided a 3-view of the original Yeoman Dixielander, last September. Besides the several letters from intrigued readers, I also got a number of questions about the TMA. Please be advised, as I told you last month, that the TMA (tail moment arm) on the plans in the article is incorrect. The true TMA (from wing T.E. to stab L.E.) is 19 inches. Better yet, you might be interested in purchasing the full size plans. Such a source is: Floyd Reck, 10332 Tristan Dr., Downey, CA 90241. Floyd has the original plans available in reduction for $4.00 postpaid. He also has several other sizes: 288 sq. in. for Cox .09 for $3.00; 245 sq. in. for 1/2A at $2.00; 250 sq. in. for 1/2A at $3.00; and an 800 sq. in. for a .40 at $5.00. Floyd also carries a number of other plans, mostly O.T., in various sizes. Write directly to him for details. Plans are listed postpaid in the U.S.

BULLET BOB'S BITS 'BOUT FREE FLIGHT

Terry Edwards writes from Boulder, CO with an interesting question: "What do people do for timers? I called Mr. Tatone and found out that he no longer carries timers."

Well, Terry, there are still several sources for engine timers . . . assuming you don't want to make one up yourself from a camera timer. I'd suggest you write to Kustom Kraftmanship or FAI Model Supply. Both of these businesses are advertisers in Model Builder. At last look, both of them also sell KSB clockwork engine and d.t. timbers (*surprisingly enough, so does Circus Hobbies! wcn*) You may wish to consider a Seelig Timber, which is heavier and costs more, but it is a premium piece of equipment. Doug Galbreath sells them for $25.00 at last advertisement. Doug is at 707 2nd St., Davis, CA 95616

Terry further queries, "Are any of the new covering materials light enough for free flight use?" I understand, Terry, that Micafilm is an excellent free flight product, particularly for larger models. My preference is for the old standbys . . . dope and tissue. Terry does pass along this tip for builders who are traveling salesmen: "One note about building in hotels. I have found that the bottoms and backs of dresser drawers make good building boards. I usually leave a tip for the housekeeping people and a note to please do not disturb the building area. I take great pains to get all of my shavings in a waste basket and keep my mess to a minimum. Sanding is a problem. The Dixielander was sanded over the bathtub. I washed it down the drain and had no mess."

CHAMPION RUBBER

George Schroedter, proprieter of Champion Model Products, recently wrote to inform that a new and better batch of rubber is now in stock. George reports this is the best he has had in over two years, with an energy return of between 3479 and 3600. Price is unchanged at $11.50/lb postpaid UPS. Drop George a line and get in on the good stuff . . . 880 Carmen Court, LaVerne, CA 91750, is the address.

THE FLAMING OF THE FREE FLIGHTS OR FLASHING THE TRASH.

I thought I would end this month with a story. In fact, this is a true story . . . the best kind.

It all started a couple of years ago at one of our contests. I noted a bright and brief fire in the field. Standing near was Bill Giffen with his hand over his heart. I thought little more about it. Then at a subsequent contest, the scene repeated itself . . . I got there too late for a good picture. Sure enough, it was Bill again. In the funeral pyre were the charred remains of a couple of his broken free flights.

This year, at our Annual, I decided to join Bill. The stack of broken models grew . . . containing a 1/2A Spacer, a RamRod 432 and the silked wing from a Playboy Senior. The flames were bright and over quickly. All those gathered around placed hands over hearts in honor of the departed glories . . . A new tradition has begun.

Until next month, build like crazy, dream good maxes, and wait for the good weather . . . it's an FAI year, so plan on winning.

Thermals . . . •

"I think it needs some of that stuff that makes it go up."

★ ★ ★

Diesel engines for models probably hold the record for being a highly acceptable item that has been almost totally overlooked by U.S. modelers for longer than any other product available. For sport flying, which especially in R/C constitutes about 90% of the flying activity, diesels are hard to beat. Try this: no batteries, coils, condensers, or spark plugs (ignition engines), no starting battery or burned out glow plugs (glo-engines), quiet running and capable of turning bigger props with higher torque (four-cycle). And the diesel exhaust smell? The basis for most bug killers is kerosene, diesel fuel's main ingredient, so it keeps the flies and mosquitos at bay. In fact, if you want to "improve" the smell, use scented hurricane or patio lamp oil in the mix!

What are we leading up to? One of our small but continuous advertisers is Eric Clutton, purveyor of the British-built P.A.W. (Progress Aero Works, Macclesfield, England) diesel in the U.S.A. He now carries a line of 16 P.A.W. diesels ranging in size from .049 to .35, including assorted R/C types and competition (Schneurle ported) types, with prices ranging from $23.50 up to $72.00. Also in stock are many spare parts. Send Eric an SASE for his list; 913 Cedar Lane, Tullahoma, TN 37388, phone 615-455-2256.

When you mention diesel, most modelers comment that fuel is hard to find at your local hobby. Understandable in a way, as there's not much demand . . .right now. Bob Davis, of Davis Diesel Development (see ad in this issue) is about to market diesel fuel concentrate . . .everything but the largest ingredient. . .kerosene, or that scented lamp oil. Buy the concentrate from Bob and mix as you need it. Don't forget, diesels consume fuel at about half the rate of glow engines, so they're more economical!

Tell ya one thing they're worth . . . they're worth looking into. Ought to be great on OT's. . . .and you don't need fuelproof dope!

★ ★ ★

The 17th issue, or volume of Paul Matt's *Historical Aviation Album* series is now available. If you've had anything more than a passing interest in aviation over the years, and as a modeler, have a special interest in scale model aircraft, you've no doubt already known about this classic series. Each volume has taken several specific aircraft, ranging in an era from early post WW-1 to post WW-2, but mostly from the Golden Era 20's and 30's, and thoroughly recorded each one with many photographs, detailed historical information, carefully compiled statistics, surprising first-hand pilot commentaries on flying characteristics, and best of all, from the modeler's point of view, excellently detailed scale views in a clean and uncluttered style that has become Paul Matt's easily recognized trademark.

This latest volume features the Standard J-1, to the casual observer often confused with the "Jenny," but considered a better aircraft in many ways; everyone's concept of the bush pilot's airplane, the Fairchild FC-1, FC-2, and FC-2W monoplanes; the famed military twin trainer, the "Bamboo Bomber," "Bobcat," Cessna T-50; and good old "Dumbo," the consolidated PBY-5A Catalina.

In all, Volume 17 contains 96 pages, 193 photos, and 15 pages of scale drawings, in an 8-1/2 x 11-inch, perfect bound, soft cover format. Price is $10.00 each, postpaid in the U.S.A., and as the address is Historical Aviation Album, P.O. Box 33, Temple City, CA 91780, California residents must add 6% sales tax. Once you get this one, you'll be unhappy to know that Volumes One through 14 have become collector's items (that is to say, they're out of print). However, Volume 16 ($10.00 P.P.) and Volume 15 ($8.50) are still in stock.

Modelers are a little more fortunate. All scale-views presented in all volumes are still available in full-size prints in varying scales of 1/8, 1/4, 3/8, 1/2, 3/4, 1-1/2 and 2-inches to the foot. Send 50 cents and an S.A.S.E. for the complete list of 114 subjects (Grumman J2F-5 "Duck," Aeronca K, Waco UMF, Howard DGA-4 "Mike," Curtiss-Wright CW-1 "Jr.," Curtiss R-6 Racer, Laird LC-DW-300 "Solution," Vought SBU-1, Waterman "Arrowbile,"

Counter . . . . *Continued from page 9*

ed hull, deck, and several awkward shaped parts. Cabin is built from die-cut ply. Boat can be outfitted with revolving radar antenna, lights, foghorn, and siren.

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Engines . . . . . *Continued from page 19*

necting rod meets the piston in a "ball-and-socket" fit, like small Cox engines.

Although the "Johns" have now been produced for several years, the two TUNED PIPE variations are new in 1984. The non-tuned pipe version is the "John" Normal, the piped version complete with pressure tap is the "John" Racer, and the version with R/C controlled compression for speed adjustment is the "John" R/C... which is the ultimate in watch-like design and manufacture in its variable compression assembly...this is the one we chose to run and it IS a screamer...just over 18,000 RPM's full bore with throttling varying somewhat around 8,000 RPM's for the low end...slow enough for a small R/C model to descend...on a Cox 4.5 x 2 gray prop (not supplied).

"John" engines come without printed instructions...they are fitted into a carefully cut pair of styrofoam sheets and are shipped in a sturdy carton in which twist drills are normally packed in his country.

RATINGS

The "John" R/C version earns a *PERFECT* "10" for design appearance, a *PERFECT* "10" for manufacturing excellence, and it also earns a *PERFECT* "10" in performance...for a grand total that rates this as one of the finest model airplane engines in the world! The "John" Normal costs $95, the "John" Racer costs $125, and the "John" R/C costs $150...all prices postpaid, and I can help you make proper contact. •

Europe . . . . . *Continued from page 18*

I'm not sure this name is used in the U.S.A. too.

Anyway, Charly comes in an "almost ready to jump" kit, with the most important part, the parachute and its many lines, ready made. The two servos that must be fitted, each control one of the arms. Those arms are, in fact, screwed directly to the servo output discs. The hands are connected to the steering lines, with which the trailing edge of the parachute on either side can be moved. If the left hand pulls the line, the left trailing edge is pulled down proportionally, and extra drag is generated. A turn to the left will follow. If both lines are pulled simultaneously, both forward and sinking speed will bleed off. As the lines are pulled further, then Charly will quit going forward and, after a brief near-stop, he will sink very rapidly. This stall condition can be used to make a very soft landing, but watch out, if your timing is wrong and you flare too early, Charly will not like it!

As the picture shows, I take Charly up hanging belly-down under my 9 ft. Piper Cub workhorse. The chute pack on Charly's back fits into a recess in the bottom of the airplane. At about 700 or 800 feet I let him go, and after that he is in Henk's hands. If he decides the free fall has been long enough, he moves both arms of the doll forward and the chute will open. If all goes well, Charly will be very controllable and can land at your feet.

It really adds an extra dimension to our hobby, and, as we experienced, attracts a lot of attention at meetings and airshows. There is another side to it, and that is the aspect of competition. Several contests have been held during the last few years in Germany, and last autumn there even was an open European meeting in Belgium. It was organized by Peter Blommaart (of F3B and F3E-fame). In short, the rules were as follows:

A free fall of at least 5 seconds; for every second less one gets 100 penalty points.

A target landing; landing in the center circle (one meter diameter) means 0 points. Landing in the outer circle (40 meter dia.) gets you one point for every centimeter distance from the center point. If one lands outside the outer circle, the punishment is 3000 points. So he who gained the least number of points will be the winner.

The two-day event in Belgium saw 35 competitors in action, and it was such a success that Peter Blommaart is going to take the necessary action to have this type of competition officially sanctioned by the CIAM, the model airplane organization of the FAI. A very interesting development, and I'm sure we will hear more of it.

See you again next month!! •

Simply Scale . *Continued from page 31*

glued blank reinforcing strips made from file folder stock on the covered surface at the rib positions, marked the locations of the stitches, and applied dabs of RC-56 for simulated stitches. I then make "pinked" tape and apply using the same basic method as Tommie. I've found the RC-56 "stitches" are more resilient under the pinked tape and "give" a little when you're cleaning the model, preventing wearing off the paint on the stitches.

Don't forget, the pinked tape is usually applied around the perimeter of the flying surface (leading and trailing edges) and along "wear points," such as stringers on

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fuselages.

Tom's stitches were spaced 1/4 inch and his pinked tape was cut 3/8 inch wide based on his 1/5th scale model. If you're building a 1/4-scale model, your stitches would normally be spaced 1/2 inch apart and would be about 5/32 inch wide, the same as the reinforcing strip. The pinked tape would normaly be 1/2 inch wide on the stitches and stringers and 3/4 inch wide around leading and trailing edges.

"Cutter bars" of various lengths, depths and teeth size can be found on waxed paper, plastic wrap, and aluminum foil containers. Look around for the one that best suits your purpose. I use an 18-inch long cutter off an aluminum foil container. I've also found tracing paper to give me a better defined "pinked" edge than other materials. To each his own! Experiment on a scrap wing (we *all* have *those* laying around!).

Tom continues in his letter with a very neat idea on simulating piano hinges on your model. This is the method he used on his PT-19.

"Buy some solid 1/32 inch picture hanging wire at your local discount department store. Tie one end of a 24-inch piece to something solid and 'pop' it gently with some pliers, crack-the-whip style." (Oh really? cjt) *This will straighten the wire. Cut off a piece the length you need and gently roll it under your pen knife blade at 1/8-inch divisions. Don't push the blade too hard or you'll cut the wire. The 'piano hinges' can now be glued on your model using thin C/A."*

Great ideas Tommie, and I really thank you for sharing it with us. I'm sure there are lots of readers out there who also have some good ideas and techniques that would prove interesting and beneficial to other Simple Scalers. Let's hear from you! Once again, my address is: Cliff Tacie, 49404 Michelle Ann Dr., Mt. Clemens, MI 48045.

★ ★ ★

In case you pick up an issue of **Model Builder** in the future and you don't see my *"Simply Scale"* column in it, please don't panic! You'll probably find me changing to a bi-monthly (every other month) frequency due to my present increased workload at my regular job. This column does require a considerable amount of time and effort. but there's a lot of satisfaction as a reward, especially when I hear from readers or see them at events. What fuels my fire is receiving letters from "Simple Scalers" such as one I received recently from William "Bud" Martin of Roanoke, VA. Bud wrote simply to let me know how much he enjoyed the column. It's a shot in the arm for me Bud, and I thank you.

I've also found it necessary to resign as Secretary/Treasurer of NASA, the National Association of Scale Aeromodelers. Please address any correspondence for NASA to the President: John Guenther, RR #1, Box 715, Borden, IN 47106.

If you just have questions regarding scale, please feel free to direct them to me. I'm not out of business, just cutting back to a manageable level!

Until next time, when we'll probably discuss a simple way to make your tail wheel assemblies more realistic, and present abbreviated notes and observations on the 1984 U.S. Scale Masters and the Hamilton Hawks Four Stroke Rally....

Keep it scale and simple!

Four-stroker . . *Continued from page 22*

produce satisfactory results. *But do not* equate low r.p.m. full throttle settings with low r.p.m. *low* throttle settings.

Heat is a by-product that is closely related to power developed and claims of higher power with less heat should be carefuly scrutinized. As a general rule, higher power (higher heat) plus a cooler engine can only become possible if more *heat dissipation* is occuring. Unless you water cool the engine, or add more fin area or pressure cool the engine, the only practical way I know of achieving this miraculous condition is altering the fuel with more nitro and oil.

Now let's talk about using the mixture control device. If you are deaf to engine sounds this can prove tricky, but for those of us who listen to engines, here's a technique which works.

1. Select a muffler or pipe setup which gives you the desired noise level. The big mufflers are very quiet.
2. Establish a slightly rich, full throttle setting before taking off.
3. Fly the plane and listen to it while slightly adjusting the mixture control rich, then lean, back and forth, etc.

You will probably quickly learn to recognize a slight crackling sound when the model is climbing, as a too lean sound. You may have trouble recognizing a too *rich* setting because low power plus misfiring can also be indicative of lean settings. The trick is to set your ideal mixture at a mid-level setting and when in doubt...go rich, *then* go lean! Once you have learned the "ear" setting technique, you will probably not fiddle with the mixture except after changing fuel cans.

What about claims of very low oil content fuels? Frankly we are reserving judgement, as some excellent new lubricants are coming on the market. My chief concern is not the lubrication qualities of these products, but their temperature control abilities, especially in low percentages.

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If any of you have some solid data on this, write me and let's print it. So far I have heard only unsubstantiated opinions and have yet to see a low oil fuel which wasn't peaky. This peakiness I attribute to poor temperature control. Any comments? •

Seguin . . . . . *Continued from page 13*

shaped aircraft which flew at the event. Their F-16 Thunderbirds team flew a duo, but without a doubt the show stopper was a demonstration by Don Muddiman and Tommy Veloskey with their Firebird KFIR's. They put their jets through their paces with near precision. The two aircraft did side-by-side take-off rolls, one rolling clockwise, the other counter-clockwise. They did four-point rolls, knife-edge flight, side-by-side loops, opposing maneuvers, as well as a side-by-side low pass with one aircraft inverted over the runway. Had you been a cameraman operating a video, from take-off to landing, except for opposing maneuvers, both aircraft would have been in the viewfinder throughout the flight. The apparent ease with which this was done makes one wonder *how* it was done. The Cloud Dancers have been performing shows of this type for the last four years. However, this was their first attempt to do the maneuvers with ducted fans. The results were outstanding and perhaps are a testimony that there are no longer mysteries to them. This performance certainly dispels the myth that fans are only for "experts." A word should be mentioned about the accomplishments of Tommy Veloskey. He competed in the 1983 U.S. Scale Masters with a Blue Angel Cougar at the ripe old age of 16! As noted, he is also the No. Two pilot with the Cloud Dancers Show Team. The Baron's Outstanding Flying Skills Award goes to the Cloud Dancers for their demonstration.

Sunday dawned less windy but a great deal grayer than Saturday. The clouds never broke, and the rains came and never went. So by 1:30 p.m. the Greater Southwest 2nd Annual Fan Fly In was declared officially ended.

At the conclusion, there were a few token awards hastily and informally presented amid the raindrops. As previously mentioned, Bob Walters received the award for the Fastest Speed. In the category of Vertical Performance, the only two entrants were both Byron F-16's, which shared the award. Balloting, which was done on Sunday when fewer airplanes and fewer people were in attendance, determined the Best Overall Plane to be Tom Cook's F-4 Phantom and the Technical Achievement Award went to a BD-5J powered by a Byrojet and Rossi .81. Only aircraft which were flown were eligible for the awards. Tom Street's 737 was given the C.D.'s Award for putting on the best show. The Baron overheard quite a bit of controversy regarding this choice.

As the rain increased, Baron Luftwing Wolfgang von Jetski left the flying site. The weekend and the event had been, by all accounts, a successful one. The greatest need for improvement was out of the hands of mere mortals...for it was the weather! Through rain, or shine, or sleet, or hail, the show did go on . . . and the Baron returned to his homeland yearning for one of these two-holers without a propellor. But all he could find was a windmill in Holland! Oh well . . . better luck next year! •

Indoor Electric . *Continued from page 47*

Top Flight wood prop, which goes good ROG and will fly the plane at half throttle in cruise. I used micro switches to switch in a resistor for half power. The plane is built of 1/8 square balsa and Japanese tissue, with one coat of Sig Lite dope (clear). The ribs are all built up, and this caused problems in the dry Reno air, the tissue shrank even more, and caused the wings to warp some. If you build a model in a high humidity part of the country and plan to take it to a low humidity area, it is best not to shrink tissue at all, otherwise the shrinkage will be far too much. The wheels are made from styrofoam turned on a drill using a model knife for shaping.

Addie and Tony Naccarato's Farman is a real veteran of indoor flying, this is its fourth year, and it flies beautifully. It is 1/4-scale, built of 1/8th square balsa, and Japanese tissue. The wheels are built up from balsa, the radio is the Cannon micro. It uses an Astro 035 for power with belt reduction and a five-cell 550 mah GE pack turning an 8x5 prop. Motor control is just on-off. The span is about 80 inches, weight 24 ounces. In addition to the electric Farman, they brought a rubber powered one! It is identical in size and construction, but weighs more due to thirty loops of 1/8th inch rubber, at 26-1/2 ounces all up.

Now for the flying! My attempts went poorly, I did not have enough power to climb, and the best I could do was a single circuit of the hall. I tried props up to 11x6, but with no improvement. This is still a mystery to me, everything was the same as at sea level and it flew well there. Oh well, it did fly, though only briefly! Tony, on the other hand, showed how it should be done, with beautiful flights using the Farman. He did the figure-eights, and even touch and goes! This was all

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done on the same prop as at sea level, so I really don't know what the problem was with the Tabloid. The Farman is beautiful to watch in the air, very smooth, and a real crowd pleaser. Tony got plenty of well deserved applause for his flights. The really amazing flights were with the rubber powered Farman, it had an excellent climb, and could fly for over a minute, making about 1-1/2 circuits of the hall before landing. Congratulations, Addie, that's quite an achievement (Addie is the designer and builder)! Tony got a well deserved first place for his flying, I got second for "being there!"

Besides R/C, there was indoor CL scale. The Black Sheep Squadron, from Burbank, showed up in force, their planes are beautifully made from Guillows kits and powered by Astro 020's. These are displayed, in action, at the annual IMS show in Pasadena. These planes fly from self-contained Ni-Cd packs, no "battery at the belt" stuff. In open, Lon Tar Dis won first with his Corsair, Addie got second with her Airbonita, and Tony was third with his Skyraider. In Jr., I neglected to get the exact placings, Frank Godel, John Godel (Hellcat), and Robert Mehmen (P-26) placed.

The star of the show, though, was Addie's Little Arc, a fun 020 U/C just especially for kids. Addie designed it as a learner's plane, and there were lots of kids volunteering from the audience to fly it! They all had complete success, and big smiles! This plane is a little gem, it weighs eight ounces and is powered by an Astro 020 FF system. It will fly no matter what a kid does to it, if they hold in full up elevator it will go around with its nose way up in the air, but it will not stall. If you lower the nose, it accelerates nicely and will do wingovers with no problem at all. I wish I had had a plane like this when I was a kid! It is an ideal way to start the kids in models, those who flew it attested to that. It is all sheet balsa, and quite easy for kids to build. Addie says that it takes less than a day for the kids who have built them. The Little Arc will appear as a construction article, I would certainly like to see it available as a kit.

My overall impression of the electric indoor flying was that both the spectators and the participants had a lot of fun, and that these events are ideal for the Nats. I think there will be more of them at future Nats, and everyone will have more fun electrically! •

Plug Sparks . . *Continued from page 38*

glow engine craze.

FORTY YEARS AGO, I WAS . . .

Gordon Codding, of 3724 John L. Avenue, Kingman, Arizona 86401, has a veritable plethora of information on the old days (1935 to 1939) on flying at the old Western and Rosecrans area in Los Angeles County. Those were the days when it was commonplace to see over 200 competitors and loads of spectators.

Gordon was fortunate in that he kept most of his old negatives of the models of that day. As time and space permits, we will gradually use up his priceless shots.

Photo No. 7 is one of those shots of a customized model. Modelers in those days would take, in this case a Pacemaker, using an Ohlsson Gold Seal, and put on a hand-hammered aluminum cowl that extended to a racey windshield done in teardrop outlines. Add a set of wheel spats and you had the makings of a custom-made model.

Not content with that, Gordon reports this particular modeler straightened the trailing edges on the tail, then proceeded to give the model a beautiful red lacquer and silver paint color scheme. The model was built before WW-II, strictly for the GMAASC (Gas Model Airplane Association of Southern California) Precision Type Contests that were often held at night to take advantage of the calm air.

"In those days, you made your takeoff from the center of chalked concentric circles. You stated loud and clear how many circles of climb and glide it would make. Then you hoped for a landing inside the center circle. All this with a spark ignition free flight model!

"Along came WW-II, and the owner/builder carefully stored the model away. Came the end of the war and the model was brought out again, somewhat bleached and dusty. It had dried out, but cleaned up nicely.

"The usual hand crank starting procedure, to try and recall the proper needle

valve setting, position of the timer. The motor popped a few times, then a few backfires, and then, horrors . . . it was on fire! Apparently fuel had collected inside that tight cowl and a backfire did it in. The gentleman had just about enough time to kick the engine and front end loose, thereby saving the valuable parts, before the whole model went whoosh! This was real sad, as it left only a blackened area on the CMAASC Flying Field."

All of this happened before Gardena started expanding. Another field lost to "progress."

"TUFURONE" CONTEST

Yes, just like it says, the Marin MAC and SAM 27 teamed up to run two contests on one day at the SAM 27 Annual, held October 7-8 at the Olive Ridge Tennis Club grounds near Novato.

Both days were devoted to flying of O/T R/C models and O/T rubber models. This, of course, required two Contest Directors, Don Bekins and John Gomez (drafted from SAM 32). To show the amount of activity of these two days, there were eight R/C events and six of the free flight events. Needless to say, the field was quite busy with models.

In the rubber events, this writer continues to be amazed at the number of Modelcraft Pacific Ace 30" models that enter and fly! A year ago they had 28 entries. This year had 14 official flyers. Seems like they all fly, just some better!

To spur interest in pre-registration, a modeler could enter all gas and F/F events for $16.00!! Talk about a bargain! Late entries were charged $5.00 per radio event and $2.00 for F/F events. To boot, for $9.00 you had a picnic dinner at the Olive Ridge Tennis Club.

This king-sized gazebo turned out to be one of the most pleasant Saturday evenings this writer has spent in a long time. Not enough credit can go to Jack and Mrs. Tatum (particularly!) for the excellent buffet supper. If you didn't get your fill that night, it was no one else's fault!

Saturday morning was a terrific day with the rubber powered models filling the skies. As it turned out, this wasn't necessary, as the wind never did come up in any sort of strength. Real good times were put up by both types of models.

A new gimmick, the Ohlsson powered event, made its debut. This new event restricted the use of any size Ohlsson engine to the three-port type, as no front rotor types were permitted. Although a little late in announcements, four actually made official flights!

As can be seen in Photo No. 8, the winner, Al Staben, is seen with his Ohlsson 60 powered Lanzo Bomber. As Al said, he never had it so good, making three perfect flights to win the event. This event looks like the fun we have been missing of late. The restriction to side port Ohlsson engines only will help cut down that horsepower race.

Also seen on that day was Pond's latest, a Lackey Zenith, as depicted in Photo No. 9. In the rush to complete the model for the Texaco Event, the white sunbursts (typical of Pond models) were left off; otherwise, the model has the standard Pond color scheme, red, white, and blue.

This six foot model weighing four pounds was powered by an OS 40 four-cycle engine. Despite the fact the fuel allotment was only 16 cc, the engine ran between 3-1/2 to 4 minutes. That put it as high as any of the competition. It is noted that a good flying big model will always beat a good flying small model and so it was: Big models were doing from 16 to 20 minutes while the smaller model was only approaching 14 minutes. In light lift, this discrepancy is quite pronounced.

On the other end of the scale, Photo No. 10 shows Bill Burleson, of SAM 30, with his huge Gas Bird, OS 60 4/c powered. This model has been extremely successful in the last few meets by consistently winning first against some real tough competition.

After registering two excellent flights, Bill banged up his model flying it in the Antique Event. Bill should have the model repaired in time for the SAM 30 Annual several weeks hence.

After the sensational showing by Eut Tileston with his Elfin diesel powered Lancer 49, Eut has built a Class B version and now a large scaled version of the Lancer 72 as seen in Photo No. 11. Powered by an OS 90 four-cycle engine, the performance of this model is absolutely sensational, as the climb approaches 70 to 80 degrees. With such a clean frontal area, this model will glide with the best of them. We ought to know, we have seen it go!

It might be well to reflect at this time, the advent of the .90 four-cycle engine making itself felt in the old timer R/C events. Because of the AMA ruling that four-cycle motors are to be considered 60% displacement of a comparable two-stroke engine, this places the .90 in the .54 cu. in. category.

This follows a trend to larger size models, as small models are quite difficult to see at the altitudes Texaco models normally attain. This writer looks to find the average (not the unusual) size to be around ten-foot wing span. With power like the 90, there is a definite need for visibility, something only attainable with large models.

The writer has rather mixed feelings as to whether big models are good or bad (or is it beautiful?). The only limiting factor would be the mode of transportation. Can you get these large models in your vehicle?

The next problem is color visibility. Experiments have shown that fluorescent orange is the best for vision but this does not seem applicable against a blue sky where white is shown to advantage. However, white has the disadvantage of disappearing into hazy or smoggy areas. Perhaps the solution is the multi-color scheme the author employs. Claims for black, a la buzzard, are great on a cloudy day, but reflection is practically nil on a clear day. Maybe we should have a color expert expound on this problem. *(We had such an article many years ago. Maybe it's time to recycle it. wcn)*

As pointed out before, this contest was one of the best, with prizes running well past sixth place in each event. To say the least, no one went home empty handed. Let's take a look at the results, but only to third place. We have too many events to list!

R/C O/T EVENTS

Ohlsson Event

1. Al Staben	(Lanzo/OR 60)	21:00
2. John Pond	(Turner Spcl/OR 60)	12:41
3. Nick Sanford	(Scram/OR 60)	1:38

Class A

1. Jim Kyncy	(Kerswap/K&B 19)	18:39
2. Eut Tileston	(Lancer/Elfin 2.5)	18:01
3. John Pond	(Playboy Jr/Torp 19)	3:21

Class B

1. Jim Kyncy	(Kerswap/K&B 21)	21:00
2. Ed Solenberger (Playboy Jr/Torp 29)		20:52
3. Eut Tileston	(Lancer/Enya 46 4C)	19:25

Class C

1. Ed Solenberger (Playboy Jr/McCoy 60)		20:37
2. Monty Pate	(Dallaire/OS 90 4/c)	19:58
3. Eut Tileston (Westerner/OS 90 4C)		19:22

Texaco

1 Bill Burleson	(Dallaire/OS60 4C)	54:40
2. Eut Tileston (Western/OS90 4C)		52:40
3. Dave Bruner (Lanzo Bomber/OS40 4C)		43:38

1/2A Texaco

1. Tom Vincent	(Playboy Jr.)	30:00
2. Jim Kyncy	(Anderson)	28:39
3. Kerry Lance	(Mike)	28:07

Electric .05

1. Jim Ogg	(Mike/Astro 05)	13:37
2. Ted Kafer	(Playboy/Leisure 05)	12:43
3. Steve Roselle	(Panther/Leisure 05)	11:39
4 Nick Panagitou (Playboy/Leisure 05)		11:39

Antique

1. Stan Lane	(Anderson/OS 60)	39:30
2. Jim Kyncy	(Anderson/Rossi)	36:26
3 Monty Pate	(Dallaire/OS 90 4C)	28:05

MAC F/F Results

Joe Ott Scale

1. Jack Little	(Stinson SM-1)	:97

Rubber Scale

1. Tex Newman	(Corben Super-Ace)	2:34
2. Jack Little	(Stinson SM-1)	:97
3. Don Wrench	(Miles)	:79

C02 O/T Replica

1. Jim Harrison	(Interceptor)	2:04
2. Jack Little	(Red Ripper)	:10

.020 Replica

1 Jim Harrison	(Mercury)	4:58
2. Bruce Augustus (Strato Streak)		3:54
3. Dave Lewis	(Strato Streak)	2:21

Werle Profile

1. Ernie Johnson	(Baby Ace)	6:58
2. Tex Newman	(Ross Flyer)	4:02
3. Bob Lee	(Ross Flyer)	3:79

Pacific Ace

1. Bob Lee	4:94
2. Ernie Johnson	4:39
3. Tex Newman	4:02

EPILOG

Of course, everyone has their share of crackups but it remained for Nick Sanford to put on the best demonstration with his Anderson pylon. Immediately after take-off, we were treated to a horrendous noise that had the crowd scrambling. Would you believe the model missed everything but the ground!

Perhaps the weirdest thing happened to the writer who had three models parked by the back of his car with less than two inches separating them. Over came a red hot Zipper and plowed right into the middle of the models. Amazingly, not a scratch on any of the parked models, but the Zipper was definitely hors de combat.

SPECIAL ANNOUNCEMENT

Based on the sensational success of the Modelcraft Pacific Ace 30 rubber event over the past three years, this columnist will offer three trophies for a Modelcraft Black Bullet Event. There will not be the restriction to the 30-inch model, but will allow all sizes of the Schlueter series of Black Bullet models. We are hoping Dave will also donate to the event prizes. Don't say we didn't tell you about this new fun event!

READERS WRITE

In 1983, Bill Simpson, of Rancho Palo Verdes, sent this columnist ten photos of the early modeling days of Mel Anderson when he was working at the Grand Central Terminal for Major C.C. Moseley, turning out Baby Cyclones and later, Super Cyclones.

Photo No. 12 shows Mel Anderson in 1936 at Muroc, where they hoped to set an endurance record (which they later did with a different model). What makes this "X-44" model different is that it was built by Bill Atwood, with an all aluminum engine made by Anderson.

We have other photos sent by Bill that we will feature in future issues. In that same line, it has been quite some time since we have run an old time photo by Bruce Lester.

While at the 1938 Nationals, Lester snapped Photo No. 13 showing a model he believes is Stott's model from Staten Island, New York. We would appreciate hearing from anyone else who has a different, or more complete identification.

Dr. James "Bo" Buice sent in Photo No. 14, showing Joe Percy, from Ft. Worth, Texas, at the West Coast SAM Champs, Merwin Ranch (the dichondra field) in 1982 with a scaled Riser Rider designed by Ray Marquadt. This 60 powered version is a real tough model to beat!

We have received numerous photos from R.B. McKenna, of Los Angeles, but unfortunately he seems to have the propensity for getting shadows in all his pictures. However, we did recently receive a series of photos taken in black and white back in 1942.

Photo No. 15 shows R.B. McKenna in his younger days with a Berkeley Buc-

caneer B Special powered by an Ohlsson 23. As can be noted, the wing slots originally specified have been covered over. Many modelers did this with the wing design, as the wing slots did little or nothing to improve the glide. Perhaps models fly at the wrong Reynolds number?

AUSTRALIA

In the last trip to Australia, this columnist picked up more than one interesting photo. Inasmuch as we featured the Nats O/T Controline Events as the lead article in the December issue, it seems only appropriate that we show those two friends (and rivals) when they were young.

Photo No. 16 is a shot taken back in 1952 with the writeup on the backside noting that the modelers were involved in the hobby business. Farnan had a dual business going, with a small hobby shop in Camberwell, plus being a comptroller for the Myers group (one of the largest department store chain systems. Tony later retired from Myers as a Director and set up the O/S Engine Distributorship). Tony used a biplane design of his own powered by a Torpedo 29. Please note the checkered color scheme matches the tie! Nothing like going first class!

On the left is the redoubtable Tyrrell with his Spitfire powered Super Zilch. He loved to terrorize the crowds with his death defying climbs and dives. At that time, Monty had just put in his time with Hearns Hobbies (later of Model Aircraft Industries, and Australian Hobby Center of Adelaide. This encompassed fourteen years and at this time has taken a position with C.F. Barnes, one of the leading plastic toy importers).

The photo was taken at Queens Park, Geelong (across the bay from Melbourne). Photographer called these modelers young boys and said "No comment" Couldn't have put it better myself!

GERMANY

Again, another photo from Gerhard Everwyn, this time one of a Joe Weathers Mystery Man built by Walter Bungert. Gerhard concedes that old timer activity has been slow in developing, but in conjunction with Dave Baker of SAM 35, England, it appears that an European SAM Champs may not be too far away.

Noted in Photo No. 17 is the lack of a landing gear. This droppable gear caused a considerable furor when Weathers first brought out the design amid the cries of "no droppable parts allowed!"

Despite the fact that Weathers produced photos to prove the wheels never left the ground (therefore were not dropped) he was literally burned at the stake as a heretic by the Rules Committee. If you build one, make sure the gear is permanently affixed. *(If it hadn't flown so well, probably no one would have complained! wcn)*

THE WRAP-UP

While looking through the old correspondence, this writer ran across a letter from Arthur G. Cooke, R.R. #1, Site 3A, East Road, Port Moody, B.C. V3H 3E8 Canada, that seems to fit the bill nicely for wrapping up this column. Art has the following to say:

"I was a prolific gas model builder from 1937 until 1942 (Photo No. 18 shows Art with his winning Bunch Tiger powered Tlush Inspirer, being interviewed by Frank Schinn on radio at Steveston Air Field, Winnipeg, Manitoba, in either May or June of 1938). I built such models as Sadler Low Wing, Zipper, Ranger and several of my own designs.

"After a sojourn as a pilot with the RCAF, I built a Rocketeer, Cuff, my own low wing design, and a Ranger with an Ohlsson 23 that I lost at Branden, Manitoba in the Summer of 1950 after a 4-1/2 hour chase in the car covering 25 miles!

"I thought I would write because the Inspirer plan you have is similar to the one I built in 1937-38. The plan shows no center section or method of fitting the Vee dihedral to a flat top fuselage. I remember I built a taper section 4 inches on the bottom and closed off the top 4 inches to give a flat surface.

"The model flew well with the Bunch Motor on 1/4 ounch per pound, but even better with a Brown Jr. I lost the model three times, but luckily it was found each time. I used the Brown in a Zipper (wotta climb!) getting a flight of 50 minutes on a 30-second engine run. I only got the fuselage and motor back after a year!

"I returned to model building in 1981 after an absence of 30 years. The last model I built was a polyhedral low wing with cockpit for radio installation. The dog ate the wing and I gave the fuselage and tail assembly, including the Ohlsson 60, to a model shop hoping they would find a 'deserving modeler.' I also donated three Rocket 46 engines and various bits and pieces. Needless to say, all has since been forgotten, the model shop defunct and no one knows where anything is. Familiar story?"

You said it, Art, if I had a dollar for everything that I lost or gave away, I would be owning this magazine. *(If you gave me a dollar for every word in this column, you could almost buy it! wcn)*

Tailwind . . . . . *Continued from page 53*

plastic material for cockpit glazing. Glue the oil cooler/cooling air outlet (N5, N6) and exhaust stacks in place. Glue the fuselage nose to the fuselage framework. Build and paint the wing struts. Glue together the wing halves and struts mainly by the means of the 0.3mm wire pins. The pins give strong joints which, if they come apart will not tear off great areas of the covering. Install horizontal and vertical tail.

WHEELS, LANDING GEAR

Build the main wheels from 4mm balsa. Before gluing the wheel halves together, drill the holes for the outer wheel halves. When the glue has dried, sand the wheels to shape. No bearing for the wheel axle was installed. The balsa of the inner wheel half was hardened by soaking it with CA glue (drill first). Bend the landing gear wire and fair the wire with balsa to the shape of the Wittman type landing gear. Cut the balsa oversize and sand it to shape after it is glued to the bent landing gear. Glue inner wheel hub caps to the wheels and fix the wheels to the axles (see plan), add outer wheel hub caps. Build up the tail wheel. Glue the complete landing gear in place.

NOSEBLOCK

Glue the prop bearing into the noseblock. Bend the "S" hook to the propshaft. Install the prop shaft into the bearing. Install the washers and prop onto the front end of the propshaft. Bend the front end of the propshaft as shown on the plan, and push the wire into the joiner stick. Glue the front wire end firmly to the joiner stick (CA glue, epoxy). A hollowed-out prop hub covers the joiner stick and teflon washers. Because I designed the Tailwind mainly for indoor use, no freewheeler is installed.

For winding the rubber, you have to hook the winder directly onto the rubber loop. After winding, the winder is unhooked and the propeller-hook installed to the rubber. When the rubber is wound and the noseplug fitted into former N2, the model is ready for flying.

FLYING

My Peanut Tailwind weighs 5.5 grams without rubber. With a loop of 1.4×1mm rubber, 450mm (17-3/4") long, the model performs consistent flights around 70 seconds. The model is a stable flyer, easy to trim. I trimmed the model to right hand circles, the vertical tail had to be bent slightly for some right rudder. For first flights begin with about 500 turns. Raise power in steps of 300 turns and trim as required.

I wish you a lot of fun with your Tailwind, a model that flies as clean as it looks.

Electric . . . . . *Continued from page 42*

tric fly in the November issue, and I got the manufacturing donation list goofed up! My apologies to SR Batteries and the Boeing Hawks, as their support is appreciated and they didn't get listed.

In the same issue, I reported on the new Astro Challenger 15 (cobalt) and the Super Ferrite 15, and, again, I goofed! There are TWO versions of the Challenger 15 and

the Super Ferrite 15; the aircraft and the marine motors. The aircraft motors and the marine motors are both new. The Challenger 15 armature has 11 turns in the aircraft motor, and 13 turns in the marine motor. The Super Ferrite motor has 13 turns in the aircraft motor and 15 turns in the marine motor. I reported on the Challenger 15 and the Super Ferrite 15 marine motors, which I use on my seaplane (that is appropriate!). At the time I did not realize that there were two options available, and I mistakenly gave the impression that these were the motors you would get if you ordered the aircraft system. Not so! The marine motors are stock numbers 6815 (cobalt) and 6315 (Super Ferrite). If ordered as a system, these numbers are 6715 and 6215, and come with 12 sub-C cells. The aircraft motors are stock numbers 6615 (cobalt) and 6315 (Super Ferrite). The aircraft systems are 6515 and 6015, and come with twelve 800 mah cells.

I have just gotten an aircraft cobalt 15, and it is definitely a "hotter" motor than the marine motor. On a Top Flight 8x4 nylon prop, the aircraft motor turns 12,500 rpm at 27 amperes, the marine motor turns the same prop at 11,900 at 18 amperes, both on Sanyo 1.2 Ah cells. A Rev-Up 8x4 prop turns 13,600 rpm at 22 amps for the aircraft motor, and 12,500 at 14 amps for the marine motor. The Top Flight prop has a much wider blade than the Rev Up, and is, I think, too much of a load for the aircraft motor. On a full charge, the aircraft motor runs three minutes (static, on ground) with a Rev-Up 8x4 prop, starting at 13,800 rpm (the battery had warmed up). The readings were 13,000; 12,600; 10,300 after the end of each minute. The motor was hot at the end of the run; I recommend cooling for this motor. The marine motor will run four minutes turning the Top Flight 8x4 prop, I have not yet tried the Rev-Up on it. Hopefully, in the next month or so, I can do some flying tests on these motors to compare them and give you my impressions. My feeling is that competition fliers will favor the hot motor (aircraft). I think sport fliers will favor the marine motor, as it offers long flight times and load hauling ability due to its being able to turn a larger prop.

Several months ago I talked about bargain cells and motors. I mentioned the Ax Man motor, at $2.50. Tim Engel very kindly sent me an Ax Man motor, and his data on it. I did my own runs as well, and to put it in a nutshell, I am impressed. This is a good motor, solidly in the 05/075 class on either six or seven sub-C cells. My runs on a Cox 7x3-1/2 gray prop and seven SR Batteries, 1.2 Ah. cells, were as follows (readings at start, then each minute): 13,430 (initial); 13,000; 12,950; 11,500; for a four minute run static). On six Sanyo sub-C cells and the 7x3-1/2 prop, I got 13,220 (initial), 12,920; 12,640; 12,400; 11,350; 10,000 (4-1/2 minutes). This compares very well to any 05 or 075 on the market, and should give flight times of over six minutes or better with a sub-C pack. I did try a 7x4 Top Flight prop, but it is too much of a load on seven cells, at 24 amps. I recommend a 6x4 or 7x3-1/2 prop, or a narrow blade (Rev-Up) 7x4. I was impressed enough to order several motors, the address is: Ax Man Surplus, 1639 University Ave., St. Paul, Minn. 55104. They do not take phone or charge card orders, so send a check. Charges are $2.50 per motor, $1.00 handling fee, and $1.60 per pound postage. Figure each motor will weigh 8 ounces as shipped, so it would be to your advantage to save by ordering two motors, which cuts shipping and handling per motor in half. You will need prop adapters; these are $4.00 plus $1.50 postage from Astro Flight, or $3.95 from Electric Aeronautics (Box 602, Flint, Michigan 48501). I have not yet flown the motor, but it should do well if the bench tests are any indication. Thanks, Tim, for the info and for inspiring me to do the testing!

Several months ago I mentioned the *Ampere Flyer,* edited and published by Peter Blommaart. This is THE way to keep up with electric events in Europe. Looking at the May issue, there is a list of over two dozen contests for electrics, including the first meeting of solar powered models, and of electric helicopters! By the way, the EH-1, sold by Condor Hobbies, is a fine electric helicopter, if you want to try it. I wish we had such a list of contests, it sure looks exciting! This issue covers electronic speed controllers and switches as thoroughly as I have ever seen it done, with just about every U.S. and European controller listed. Subscription is $25 for

one year (12 issues), to Peter Blommaart, Rue Wauters 28, B 6200 Gosselies, Gelgium. Charge cards or checks are OK. If editing the *Ampere Flyer* isn't enough, Peter has produced the *Ampere Flyer Compendium 1984,* a reference book for electric flight; over 120 pages of information for beginners. It covers everything from speed controllers to props, planes, motors, designing electrics, voltage peak charging, a review of the Robbemax 21 autocharger, and on and on! It is $17, including postage, and well worth it. Send to the above address. I think you will find the information and events in Europe exciting. I sure would like to hear more about the electric helicopter and the solar plane meets! Thank you, Heinz Koerner, for sending me copies of these so I could pass it on to the readers.

One more item, then enough! Last time I talked about Hobby Horn's catalog, which is $2 from Hobby Horn, 15173 Moran St. (B), P.O. Box 2212, Westminster, CA. 92684. This catalog is fun to read, and full of electric goodies! Well, till next time, enjoy the New Year, make it electric! •

Control Line . . *Continued from page 59*

must be thoroughly cleaned. Use a toothbrush or similar, and scrub with solvent to remove any loose specks of solder and soldering flux.

Step Eight. Solder on the rear end cap. After this is completed, you should run some solvent through the tank, in the event that some flux seeped inside during soldering.

Step Nine. Pressure test for leaks. The only acceptable way of doing this is pressurizing the tank while it is under water. Any leaks, no matter how small, will affect the engine run, so fix it now.

Step Ten. Install tank and use! One precaution to take is to check the fuel filter regularly during the first few flights. Any remaining gunk that may be hiding inside, and any solder specks that may break loose, will generally do so on the first flights.

It wasn't mentioned earlier, but make sure you appropriately neutralize the solder joints. That is, if it is necessary. I exclusively use hobby type silver solder, which is not prone to corrosion like some other solders, if not neutralized. It is quite a bit more expensive, but is so much easier to work with.

★ ★ ★

It's that time once again, to be sifting through rules proposals for competition, and trying to make some order of it all. By the time you read this, the Contest Board's initial vote will have already taken place. This will have hopefully weeded out the proposals of general less merit.

We certainly cannot take time or the space here to review all of the proposals, but there are some which should be given some scrutiny. Please refer to recent issues of *Model Aviation* for complete details.

First and foremost, is one that could have serious ramifications, and most people will likely pay it small attention.

It is proposal GEN-86-3, which is titled "Define supercharger restriction." This proposes to amend paragraph 4.1 of the AMA rule book by adding a new subparagraph.: "1.1 Paragraph 1, above, shall not be interpreted to prohibit turbocharging or supercharging."

The proposer notes that in using four-cycle engines in RC (for noise reduction), the use of supercharging becomes a viable option, and that it is permitted by FAI rules.

(This proposal has been withdrawn, but we'll let Mike have his say, anyhow. wcn)

Well excuuuuse me, but since when do such possible far reaching rules modifications that will affect so many modelers rotate around the belly buttons of FAI RC pattern fliers?

Let's take a more clear look at this proposal which could open up a real Pandora's box of performance spiral.

First of all, the first flaw is that the proposal does not adequately define supercharging, it merely says that it is OK.

If you will refer to page 117 of the September issue of *Model Aviation,* you will find that an interpretation was made of what constitutes a gaseous boost. That interpretation was that AMA general section 4.1 does not apply to supercharging, and simply restricts the use of pressurized oxidizers.

Interestingly enough, I also see a contradiction in print. The above section states that the CL speed rules carry a separate rule on supercharging as a result of a previous interpretation that a gaseous boost is not the same as supercharging. Oh yeah?

Refer to AMA section 23, CL Speed, #2, general. "...Supercharging or turbocharging, whether it be engine driven or by gaseous boosts of *any* type shall also be prohibited. Only naturally-aspirated engines shall be allowed in the speed events."

Unless I don't know how to read, I see this as saying that if the air is at above normal atmospheric pressure, it is supercharging. Just that simple, or am I wrong?

Please also note that part of item number seven of the official AMA safety code deals again, "normal atmospheric pressure." Keep reading and see how ironic it is to allow superchargers in regard to safety. But first of all, let's look at the performance aspect.

The proposal does not give any definition or restrictions of supercharging, so anything goes, right? So just imagine a "blower" in conjunction with the carburator. An engine-driven unit of this type can mean the following: 1. Current competitive equipment could be made obsolete because of higher power available with supercharger. 2. Makes the engine more complicated (more to break). 3. Also makes the engine more expensive. 4. Engines will be heavier. 5. Engines will make more noise with corresponding higher performance. 6. In the competitive spiral for more performance, engine life will be reduced, and correspondingly

higher costs to compete will be the result. 7. There could also be safety concerns with ultra-high rpm turbocharging devices.

These are the concerns right off the top, perhaps there are additional valid ones. To summarize, this is a bad proposal because not only is it not definitive, but is narrow sighted, focusing only on a particular segment of modeling activities.

If GEN-86-3 makes it through the initial vote, then May 1, 1985 is the deadline for the contest boards to vote it down. Please pass on your opinions to the appropriate individuals.

There are other proposals that I would like to comment on, but I think enough space has been allotted for that sort of thing with just this one. Maybe next time.

★ ★ ★

As you receive this issue, a new year will be commencing. I hope the holidays were happy, and Santa brought that new engine that you needed. Now it's time to get on with the New Year's resolutions, or could we say, revolutions.

Control line is alive in '85!

Mike Hazel, 1073 Windemere Drive NW, Salem, Oregon 97304 •

Playboy . . . . . *Continued from page 20*

The radio used in the Playboy project is the Kraft KP4KB System. The Kraft, with its list price of $229.95, is complete with transmitter, receiver, battery pack, four servos, a dual-output charger, switch harness, servo trays, and frequency flags. One of the special interest items in the system is the servo reversing and travel adjustment feature on all four channels.

The transmitter is an all new design, seven inches wide by seven inches high by two inches thick, made of a molded plastic material, with a weight of just under two pounds. Adjustable control stick heights, a slide switch that operates in side-to-side motion, and a removable panel on the front of the transmitter that lets you do your servo adjusting.

The receiver measures 2-1/4 x 1-5/8 x 3/4 inches, with a weight of 1.5 ounces. The crystal is removable from the outside of the receiver. Sensitivity is in the order of 25. microvolts.

Servos are very similar to the existing K-line KPS-25's. They have a new connector and they measure 1-1/2 inches high by 1-1/2 inches long, and 3/4 inch wide. The weight is approximately 1.5 ounces each. Full 90-degrees rotation takes a scant .35 seconds. With a case gasket and degree ring on the output shaft, the servos should be good for boats and off-water flying.

Four 500 mah AA batteries are supplied for the airborne power. The entire weight of the airborne system is 12 ounces.

With the radio system installed in the Playboy, the moment of truth is fast approaching. Ready to fly, the Playboy tipped the scales at 37 ounces.

Getting ready for the first flight I used the Leisure Auto Charger to top off the batteries. This unit uses the car battery as a power source and permits monitoring of batteries under load. It also has a cutoff timer that virtually eliminates the over charging possibility.

With the full charge in the batteries, we're ready to give it a go . . . Advance the throttle and the electric motor comes to life. The Playboy was off and climbing with just a touch of up elevator. When I reached an altitude that I thought would be good for soaring, I shut down the motor and began gliding around, just like a glider. The Playboy became a new flying experience; nice slow flying and no noise. The entire flight lasted about fifteen minutes. On the landing approach you can turn the power back on if needed. For that relaxing change of pace, try electric; it's great! •

Astro Hog . . . . *Continued from page 41*

James was very impressed with the quality of the die-cut parts. Over the years, he has built kits from nearly every manufacturer in the business. The printed sheets are not as nice as having machine-cut parts, but this helps hold the cost of the kit down and very little time was consumed in cutting the parts.

We decided to build our test kit as a tail-dragger, because that configuration seemed to fit the personality of the airplane better. With large balloon tires, the appearance of the airplane is quite scale-like, similar to the full-scale Bowers "Fly Baby" homebuilt. The ground handling is excellent, so we have been quite pleased with our choice, both from an aesthetic and functional standpoint.

CONSTRUCTION

The construction is quite conventional

and there is no point in boring you with a blow-by-blow description. No significant problems were encountered at any stage. The quality of the parts fit and clarity of the instructions make assembly a thoroughly enjoyable experience. The wood quality in our kit was good to excellent and no parts had to be discarded and remade as is sometimes the case. The only area of construction requiring any head-scratching at all was installation of the O.S. FS-90. For installation of four-stroke engines, particularly in the .90 size range, it would be advisable to move the firewall aft. We decided not to, as we felt modifying the kit would be unfair in a review article. Our engine thus protrudes forward slightly more than we would like. An optional modification kit would be nice, as it is probably that a large number of modelers purchasing the Astro Hog will opt for a four-stroke powerplant.

COVERING AND FINISHING

Mike Gretz at Sig suggested that we try their Koverall fabric and new Skybrite paint system for covering and finishing the Astro Hog. Koverall is a polyester-base, heat shrinkable, synthetic fabric much like the covering that is popular on full-scale restored airplanes.

We gave the bare framework two coats of Sig nitrate clear dope, sanding lightly after each one to remove any fuzz or raised grain. Nitrate dope is a must for use with the Skybrite system as butyrate dope is not compatible with Skybrite paint. Koverall is applied by laying it out over the wing and stretching it as smooth as possible. The next step is to brush dope through the fabric around all of the edges. After the first coat dries, another application of clear dope on the edges insures a good bond to the underlying structure. Koverall can then be shrunk tight with a heat gun or iron. Three or four coats of clear dope must then be applied over the entire model to seal the fabric and prepare it for finishing with either butyrate dope or Skybrite paint. Incidentally, details of the covering process are explained thoroughly in the Astro Hog instruction manual.

After sealing, the Koverall is roughly equivalent to an unpainted iron-on fabric, although a bit more trouble to apply. Sig's product, however, is less expensive than most of the adhesive-backed iron-on covering materials. *(Sig has just released a new product, Stix-It, which permits ironing-on of Koverall, or any other non-iron-on material. wcn)* We covered both the wing and fuselage with Koverall, while the solid sheet surfaces were coated with polyester resin.

Skybrite is a totally new paint system developed for Sig by one of the country's leading paint manufacturers. It is not an epoxy or polyurethane. Sig describes it as a "TR Resin" system. Skybrite is a one-part paint that Sig claims can be brushed or sprayed with excellent results. The paint is suitable for use on a wide variety of surfaces and coverings, including wood, metal, plastic, polyester and epoxy resins, nitrate dope, and cloth or paper coverings. As we have come to expect from Sig, a detailed instruction pamphlet is available for the Skybrite system. The people at Sig really care about their customers and they want you to have success with their products.

James is a very talented and experienced painter and has worked with just about every hobby or automotive paint that has ever been suggested for use on model airplanes. We decided to follow Sig's instructions to the letter in order to make a fair evaluation of their product. Jame's comments after painting the Astro Hog were overwhelmingly favorable.

James considers the primer the best of any he has used so far, R/C or automotive. The white primer sprays well, drys fast, fills extremely fast, and sands very easily. No problems with paint adherence were encountered, at least with the Skybrite paint. James is currently conducting some compatibility tests with other paints and if these are successful, he plans to adopt it as his universal primer for all types of finishes! The price is a definite advantage over the currently-available epoxy primers.

Skybrite colors spray well and dry tack-free in 20 to 30 minutes. A hard shell cure is produced in 24 hours. Sig recommends a light tack coat followed by a slightly heavier coat a few minutes later. Skybrite doesn't appear to be particularly sensitive to humidity as our model was sprayed literally in between thunderstorms and no blushing or other ill effects were noticed. We did find that the final color coats had to be sprayed on fairly wet to achieve a high gloss. Trim colors can be brushed or sprayed on at your option and Sig advises letting the base color dry overnight before masking off for trim.

Clear Skybrite is available if you are going for a show quality finish. The clear actually has a slight amber tint to it if applied over white Skybrite. It will not attack most decals and is recommended if water slide decals are being used, as these do not adhere as well to Skybrite's slick surface. Clear is recommended if you plan to rub the finish. The instructions advise waiting two to three weeks for the finish to completely dry out before rubbing. We didn't try clear or rubbing on the

Astro Hog. Our model, when finished, had a barely perceptible fabric weave on the surface. The overall effect was quite pleasing and realistic so we decided to stop there. The entire covering and painting process added about 13 ounces to the airframe.

FINAL ASSEMBLY

After painting was completed, it was time to install a pilot figure in the open cockpit. At that point, Miss Piggy bravely answered "Moi!" Although short on flying experience, she simply could not bear the thought of someone else test-flying a plane named the Astro Hog. Just to be safe however, we also installed a Kraft 7-Channel Mk IV in the spacious radio compartment. Four servos were used and this brought the final weight, ready to fly, up to 71 lbs 4 oz.

ENGINE

The O.S. FS-90 is impressive the minute you open the box. The engine is such a handsome piece of machinery that we had a difficult time deciding whether to mount it in the airplane or on a display stand. In addition to the engine itself, there is a complete array of wrenches, feeler gauges, etc. for servicing the FS-90. A short exhaust stack and an optional muffler are also included. These extra niceties are another touch of class that in my opinion puts O.S. a notch ahead of other engine manufacturers. Weight of the engine is 22.8 oz We used a Tatone pre-drilled mount to install the engine in the Astro Hog. O.S. recommends a 12X7 to 16X6 propeller for the FS-90, and we chose a 14X6 Zinger for our test flights. First, however, we bench ran the engine for about 20 minutes with a 13X6 prop as per the instructions.

Starting the FS-90 is easy. The only problem we encountered was in the operation of the needle valve and spring-loaded choke. These controls are both located on the right side of the engine. When reaching for the needle valve with the engine running, your hand is often right in the exhaust blast when the short stack is used. Except for this minor inconvenience, operating the FS-90 is pure enjoyment.

O.S. supplies short pins that fit into the propeller drive washer and protrude into holes drilled in the rear of the propeller hub. This is a safety feature to prevent loosening of the prop in the event of backfire or pre-ignition Local engine expert, Al Wilaert, of A&M Aircraft Supply cautions against their use He has had several props shatter at the hub instead of loosening, thereby sending the blades out at high velocity. Al contends that a prop loosening and spinning off is less dangerous than one that is throwing blades. I personally tend to agree with him, so we chose to leave them off of our engine. Although we did notice some pre-ignition when the engine was leaned excessively, we haven't as yet experienced any runaway propellers. As far as I'm concerned, the jury is still out on this matter, and it's a question of paying your money and taking your chances.

FLYING

Flying the Astro Hog is pure relaxation from start to finish. The FS-90 puts out plenty of power and torque, and static thrust with the 14X6 prop is impressive to say the least. Ground handling with the big balloon tires is excellent, although the generous dihedral can be a bit of a problem in crosswind conditions. With the FS-90, however, we were able to take off using little more than the width of our runway, making it easy to face directly into the wind. Landing roll was only slightly longer than takeoff! Even with all of that power, the Astro Hog doesn't do *anything* fast "Terminal velocity" dives allowed the airspeed to build to a blistering 65 mph. or so. Flying the Astro Hog with the FS-90 gives one a sense of power and confidence, but not speed. Vertical performance with this combination is great, except for the torque causing a pronounced yaw to the left. In fact, we were able to execute neat left wingovers with no application of rudder! Some additional right thrust would probably solve the problem. Virtually any maneuver is possible, but don't expect the precision of a Phoenix 8 or Tipo. You can have a lot of fun experimenting with side slips and the like, all at a safe, relaxed pace. Pattern flyer Pat Joyner said it best. "Flying the Astro Hog is like lying in a hammock. It will always return to dead center after a few oscillations."

SUMMARY

In summary, the Astro Hog should appeal to a large number of modelers. With trike gear and a two-stroke .61 it will make a great low-wing intermediate trainer. The Astro is a bit more complex to build than some other kits offered as intermediate trainers, but much more aesthetic. With the FS-90 and conventional gear, the Astro Hog is hard to beat for relaxed, realistic, and nostalgic aerobatic flying. It's like having a low-wing J-3 Cub if you can imagine that. We found Skybrite to be an effective and economical finishing system, and I wouldn't hesitate to use it on your next project. The only disadvantage may be the at present, rather limited color selection. The O.S. FS-90 proved to be a precision machine and performed exactly as advertised. Our experiences failed to confirm any of the rumors I had heard about four-strokes being fussier to operate. To the contrary, we found the FS-90 to be very reliable and easy to operate. The Astro Hog will fly well with a .61 four-stroke, but is more aerobatic with the .90. The .90 fits in the same mounts as the .61 and is two ounces heavier. Either engine is suitable for the Astro Hog, and it all depends on what your performance objectives are.

If this review sounds like a commercial for the products involved, it is simply because we could find little if anything to fault about them. We are fortunate today in that there are very few really bad products on the R/C market. Sig and O.S are both solid, well-respected firms in the hobby industry and know what it takes to please demanding modelers. •

F/F Scale . . . . *Continued from page 49*

have available the vacuum formed canopies. I know that this would encourage more modelers to buy their plans. I personally feel that the average modeler would shy away from building the Spitfire, simply because that distinctive canopy would be a bear to make. Think about it!

These two plans sell for $4.50 post paid and can be obtained from John Bell, 650 Pinecrest Drive, Largo, Florida 33540.

Most of my modeling is scratch building, and I'm one that doesn't like to cut up any of my drawings. With copy machine service being so reasonably priced, I like to make copies of the bulkheads and parts that have to be transferred onto balsawood. I even do the wing tips, stab, and rudder for laminating purposes. Best-by-Test one-coat rubber cement is used on the back side of the copy and then this placed onto the balsa sheet. I recommend that you do not cut to the line, but close, then sand to the line for an exact part. (Exact, if the plans are drawn correctly!) This system works very well and is above all, quick!

With the copy of the wing tip, stab, and rudder, I rubber cement them to tag board, then undercut them by the thickness of the laminations I'm using. All this is a time saver. If you can save a little time here, a little there, there's more of it for modeling and flying!

One other item regarding building from plans, see Figure 1. Very often the cross-sections on plans show a bulkhead as shown. There is only a line where a stringer should go. My question is, do you make a notch where the line is for the stringer, or does the stringer lie tangent on the surface. This is a common practice by the draftsman doing these plans. I feel that it should be made more clear what their intentions are. If you get the idea that the bulkheads should not be notched, and find out later that they should, after they were glued in place...notching then becomes a hassle!

Let me make a recommendation. Personally, I'd rather have the stringers lie tangent on a bulkhead rather than in a notch. For one thing, you can make the stringer flow perfectly from the front to the rear of the model. With notches, invariably one has to be opened more than another so that the stringer is straight. Secondly, if notches are used, scalloping between the stringers is required (or should be) so that the covering flows smoothly without the unsightly bulkheads sticking out. I feel that the stringer should be "ZAPPED" in place, followed by a small fillet of glue on either side of the stringer. In my opinion, this is easier and less hassle.

Mid-wing airplanes are a challenge to make, as it is difficult to support the fuselage where the wings attach. I'm talking about rubber models, where the motor runs through the fuselage where wing bracing would be necessary. So, what generally happens in even the mildest of prangs, is that the wing wants to move back, crushing the fuselage. Everson Elwell has a clever approach to the problem of crunching fuselages (See Figure 2). This simple loop serves two purposes, one, is that it provides a "flex" if the model should land hard on a wing tip. Secondly, it becomes a guide for the rubber motor. This helps keep the unwinding motor from beating against the sides of the fuselage. What type of aluminum that Emerson used I don't know. It has to have enough temper to be springy, yet, not so hard that it cannot be bent easily. Also, I would want to have a plywood disc doubler so that the wire doesn't push through the fuselage and into the wing. Obviously, the size of the wire and the loop will be dependent upon the size of the model.

(See Figure 3) While on the subject of mid-wings, I might as well review my approach to the problem associated with these types of models. While building my Heinkel, I had to overcome two problems. One inherent to mid-wings I just talked about, and the other, removeable wings necessary for transportation. I made two bulkheads by laminating 1/32 plywood. They were cut out as shown in the illustration. The plywood provided the strength necessary through the center section of the fuselage. The long tabs provided an attachment for the wings by sliding into boxes on the wing spars.

There's nothing prettier than a sleek, inline powered Thompson racer. Yet, radial engined airplanes have a charisma all their own. At the airport, I never fail to look up when a radial powered airplane flies overhead! The sound is magic and in my opinion, just as euphoric as the venerable Merlin! However, modeling a radial powered airplane can sometimes be very frustrating. Not because engine cylinders are a pain...the Williams Brothers have helped us immeasurably on that account.

Recently, I finished Flyline's Inland Sport, a very nice model indeed. It took me many years to get it completed, but by now you know how I operate. I built the model mostly as a sport model, even though I equipped it with pendulum ailerons, and powered it with a D.C. Dart diesel. The dummy engine was one area that I was not too happy about. Let me explain. I approached the engine portion of the model in the traditional way. That is, I drilled seven holes at the correct angle in a block of balsa for the engine cylinders. The block was tack glued onto the firewall and given its final shape. After the model was painted, the engine cylinders were aligned and placed into the holes in the nose block. What's wrong with that? To me, it looks just exactly like a block of wood with cylinders stuck in it! Real airplanes aren't done like that, and I know that, with models, compromises have to be made. This is one compromise that I am not too happy with. Jack McCracken once said to me, "Look to the real airplane for a solution with a model." Naturally, we can't always do that, but the point is well taken.

What I should have done, is to construct a scale crankcase, and attached the cylinder to it. Cut away enough of the

backside so that it fits over the D C. Dart. By doing this, two things happen. First, the cylinders are vertical at every station, and equidistant. By using just a block to stick the cylinders into, sometimes it is difficult to get the cylinders equidistant. As the block is not perfectly round, some cylinders protrude more than others I hope you understand what I mean.

The next question is, what do you do about the cowling, all the space around the dummy engine? My solution isn't particularly easy to do, but it is realistic, and is the way it is done on real aircraft. There are a series of panels which go between the cylinders, and overlap each other so that attachment is possible. If the front end of the airplane is conical then stiff, quality cardstock can be used effectively. If, on the other hand, the cowl is irregularly shaped, with compound curves, as is the Inland Sport, another approach is necessary. The noseblock should first be drilled for the engine cylinders just as if the cylinders were going to be plugged into the block. The reason for this, is that when drape forming later on, these holes will facilitate the location of the cylinders when trimming. After this, tack glue the block onto the firewall and completely shaped, this becomes the mold. It would be neat to be able to vacuum form this block several times to get all of the panels necessary, but not too many modelers have the facility to vacuum form large parts. The alternative is to drape form over the mold. Remember, you don't have to form the whole cowl, but rather segments. Just enough material that will fit the spaces between the cylinders. (See Figure 4) A support at the front will be necessary, which can be attached to the engine bearers (mount).

Certainly, there is more work doing it this way, but the idea is to make a scale model, and this helps to do just that.

If you have any questions or a topic you would like to see covered, my address is: Fernando Ramos, 19361 Mesa Dr., Villa Park, CA 92667. •

(I do. You casually mentioned "drape forming," which is like dropping one shoe. You better explain it to our readers in your next column! wcn) •

Cobra . . . . . *Continued on page 27*

The Cobra features a novel type of canopy attachment which works extremely well. No screws are used to hold the canopy on, but it uses a grommet on top (Photo 3) and a block between the front frame stays. The wood block (three-eighths square by 2-1/4 inches long) is glued to the canopy five inches in from the back flange, and nestles between the stays and against the lock nuts that hold the plywood radio plate in place.

The spade bolt which holds the top canopy grommet is threaded. It will fit in the grommet better if most of the threads are filed down.

The instructions included in the kit show a three-sixteenths inch section cut out from the bottom rear of the canopy so that it "clips on top" of the edges of the main frame/landing gear. This will wear out after a period of time. An alternative method is to cut out a smaller one-eighth inch section, slit a piece of fuel line, and Hot Stuff it to this bottom edge. The fuel line will then butt against the front of the landing gear, eliminating the wear point.

Due to slight variables as to where the top hole is drilled, it may be necessary to experiment a little and increase the height of the wood block up front. Just take a little time to play around with it and get it right, because it really is nice to have a canopy that snaps on or off with no fuss!

ROTOR HEAD

I have shown the Competition (Pro) version (zero coning) of the Gorham/Hirobo head many times in this column. The head supplied with the Cobra is the standard version (with coning) used on all of the Hirobo scale birds (Photo 4). The only difference is that the standard head is cast and machined while the competition head is totally machined from a block. The quality and durability of each is excellent. The only time you'd want the Competition head is if you want to do inverted flight. For each of these heads you do have to double check the static tracking. Last month's issue had/has details.

The trick looking seesaw shown in Photo 4 can be had by simply sanding the edges with sandpaper to remove the paint . . .

In my opinion, these heads are state-of-the-art, and will give excellent performance along with the best crash worthi-

ness available.

ROTOR BLADES

The standard Hirobo/Competitor blade is used on the Cobra. This is where the Cobra and Competitor use the same product, but with slightly different flying characteristics. The same hi-lift semi-symmetrical section is used, but in the Cobra the span is shorter, giving a lower aspect ratio (11.3 to one in the Competitor vs. 10 to one in the Cobra). What this does is give the Cobra better disk rigidity than the Competitor.

Oftentimes, when the aspect ratio is lowered, the forward flight characteristics get better, but the hover starts to feel "stiff." This does not happen with the Cobra, which retains excellent nimbleness in hover as well as giving superb forward flight handling.

SETUP

The instructions cover setup well, so I'll limit my setup detail to the ranges of collective pitch I am using. I'm running −1-1/2 at idle, 5 degrees at half stick, and 8-1/2 degrees at full throttle. This is with an OS 50 FSR-H and the V-Tech muffler. With this combination, the bird hovers at slightly less than half stick, with no tendency to lose revs at the top end. If anything, I want to increase top end pitch a bit more to get a little better bite, say to 9 or 9-1/2 degrees.

NOTE: If you run these pitch throws with the given rod lengths in the GMP manual, the forward link (f) up to the swashplate may hit the top bearing block at full pitch and with an application of aft cyclic! To eliminate this you can file a notch in the top bearing block. See the arrow in Photo 3. Do this before assembly, and put scotch tape on each side of the bearing to prevent metal filings from contaminating them. Both bearing blocks do contain shielded ball bearings as standard, but they still must be taped to prevent aluminum filings from working in.

If you run greater collective throws than this (inverted flight), do not hesitate to file this notch right from the start.

The throttle throw is set up linearly, so at 1/2-stick I get 1/2 throttle, etc. Of course this depends on the engine's power of each particular ship.

For those of you who run .40's in the Cobra, you may want to run about five-eighths throttle at half-stick for starters. In fact, I bought a second Cobra and have installed a Webra Speed .40 in it. I haven't had the chance to fly it yet, but it should be a sweet combination. If you are a sport flyer who doesn't need (or care for) "dazzling" top end performance, and you'd rather go with a .40 than a .50, by all means run the Webra Speed. I've had my Webra Speed .40 for six years now, waiting in the box for a nice .40 size collective pitch helicopter to come along. Seriously!

FLYING

The Cobra loves to fly. It can be set up in the lower rpm range with mild cyclic inputs and be perfect for the beginner. It can just as easily be set up at the top end for the expert. This is what is so nice about the Cobra/Competitor series; they will fly extremely well with a variety of set ups.

Yes, the Cobra will loop and roll easily, but it will also do full down autos, which are more challenging and much more realistic. (Anybody can pull the stick back and do a loop, or push the stick to one side and do a roll.) The autorotation clutch is optional with the Cobra kits, is the exact same thing used in the Competitor, and remains the finest unit in the industry. I did my first full down autos at the Merced fly-in with the Cobra, using a set of stock, unweighted blades.

In preparation for the full downs I made a different tail stinger out of one-eighth brass tubing (Photo 5). This way, even in a deep flare, the tail rotor is still protected. Then I did my share of power recoveries to get the feel of the descent and flare of the Cobra. After I felt comfortable with the power recoveries, there was nothing left to do except go for it! On the first full down, I flared just a bit too hard and was left with a zero descent rate two feet off the ground. I waited until the Cobra settled to six inches before pulling in all of the collective pitch. It bounced, but since it touched down in a flat attitude, it didn't tip over. The rotor disk did flap enough to whack off my "Long-Ranger" style vertical fins (see flight photo, Photo 6). Oh well, back to the low vertical fins! As there was no other damage, I proceeded to fly out the rest of the tank . . . Climb out, circle, auto, climb out, circle, auto, etc.

Since Merced I have done many more full downs and polished my technique a bit further. I've come to the conclusion that I'm going to mill out each blade and put about 20 grams of lead in each tip, which will give me a bit more cushion at the bottom. Another option, which I don't want to do, is to run more negative pitch, say −2 to −4 degrees. This gives more rotor rpm in the auto, which gives a bit better cushion at the bottom, but the rate of descent starts to get excessively high, i.e., the helicopter *falls* (or is forced) out of the sky. I prefer a slower, more realistic rate of descent with more of a glide coming down. Look for another detailed follow-up report with more info on autos.

In short, the Cobra is a very pleasurable helicopter to fly, from beginner to expert.

Add to the flying characteristics GMP's new Jet Ranger fuselage (Photo 7), and now you've got a beautiful, exact scale bird that is capable of anything you want to do. This fall, Robert Gorham won the FAI team trials with the Cobra/Jet Ranger combination (Photo 8). He says that this bird flies smoother than his Competitor and the Competitor has won nearly all major contests entered since its introduction in 1983! The Jet Ranger has such a nice clean profile that it really lets it fly smoothly. You can probably guess what my next project will be. . . JR fuselages are available now from GMP at $159.95 without the scale tubular landing gear, and $20.00 more with the scale gear. Get it with the scale gear!

CRITIQUE

From the earlier parts of the review, I think you can see that the major systems of the Cobra are well designed and manufactured. That basically leaves some little things. 1) There should be an extra hole in the fuse side frames so you can tighten down the cone set-screws on the clutch shaft more easily (Photo 2 gives dimensions to add your own). 2) The front frame plate should have a hole for the metal "L" bracket (Figure 1), and the "L" bracket should be made to fit to the cooling shroud without modification. The latest word from John Gorham is that the holes will be drilled as soon as the current batch of side frames are used up, but it will be longer until new "L" brackets can be provided. 3) There should be an additional hole in the front frame plate for a switch mount (Photo 9, Fig. 1 and 2), and it would be nice if the plywood piece could be included in the kit. 4) The upper bearing block should be machined down for proper clearance for you. 5) The vertical plywood servo tray must be trimmed to fit with care (Photo 12). Note that there is relatively little material left between the lower servo and the fuel tank.

Overall, aside from these minor faults, the Cobra's design is excellent, and it flies superbly. It is not just another snake in the grass. With *one helicopter* you can progress through novice, intermediate, expert, and scale, all on a reasonable budget and with literally no compromise. I'd have to say that if I could have only one helicopter, it'd be the Cobra.

Gorham Model Products is located at 23961 Craftsman Rd., Calabasas, Ca. 91302, Phone (818) 992-0195.

Suggested list price is $325.00. Suggested List Price with Autorotation: $362.50. Suggested List Price with Pro head and autorotation: $384.50. •

R/C Autos . . *Continued from page 48*

reveal at least a half-dozen varieties of 1/8 off-road cars available.

If these folks didn't see, or already have, a market for 1/8 off-road cars we wouldn't see such availability. Hey, I just realized that when going road racing in 1/8 scale, we have a choice of only two widely available name brands; Associated with the RC500 as their state-of-the-art

racer, and Delta with the Super Eagle. While there are areas where other brands; MRP, SG, Thorp and PB, for example are raced, Delta and Associated dominate. Yet there are many choices available in 1/8 off-road!

Here locally I understand a recent off-road race did feature a few heats for 1/8 off-roaders and that six or so entered. The guys running electric 1/10 cars evidently pooh-poohed the whole thing, especially when some of the entries flamed out and then again when lap times were only equal to or slightly faster than the electrics. However, I also understand some of the 2WD 1/8 cars were pulling giant wheelies on the track, and that in itself has to be a real rush!!

I suppose the preceding sentence, while not encompassing all the performance-oriented attributes of 1/8 off-roaders, brings us back to my wondering a why we don't see much in the way of organized racing with these high-tech dirt-diggers. I mean, can't you just imagine what one of these 4WD beasts ought to be able to do? Today's high-perf .21's, thanks to development for road cars, have terrific powerbands, tons of power, and will rev like nothing you have ever heard before. Mount one of these suckers in a decent chassis, do the obligatory sorting out of the fuel feed system until the motor runs reliably, and you would have an animal!

You're right, I'm really pumped about the possibilities and plan on investigating this whole situation much further and will be letting you in on what I find out. For now, how about any interested in 1/8 off-road racing contacting me via MB or direct (see home address at end of column).

ASSOCIATED'S RC10

As long as we are discussing off-road, I talked to Midge Husting at Associated just the other day and it sounds as if the long-awaited RC10 off-roader in 1/10 scale will be widely available by the time you read this. I have seen the car in pictures only at this time, but it looks real clean and well-designed. Personally, I have great hopes for this car and the effect it can have on the off-road racing scene. Back when Associated first introduced the RC12E 1/12 car, they added legitimacy to 1/12 scale racing with a chassis that was designed from scratch for one purpose only, that of getting around a road course as quickly as possible while the competition could only offer chassis that were merely conversions of existing gas-powered designs and so not ideally suited to electric power. While we didn't know at the time how bad the converted cars really were, Associated was pleased enough to point this out with a chassis that, in my mind, was a real race car and responsible to a great extent for the quick growth in 1/12 electric racing. In other words, while the RC12E raised the level of competition several steps, it also created HIGHER QUALITY racing, as the racers had easy access to a race car that was right in the first place and could be easily tuned for max performance.

While the same exact situation does not exist in 1/10 off-road as existed in the pre-RC12E days of road racing, and Associated is coming in relatively late in the game, the release of the RC10 has to be your basic Good Thing for the future of off-road racing. And while I have yet to even play with an RC10, it is important to note that Associated has an excellent track record when it comes to being able to supply their customers with parts . . . and I don't care how good the basic car is, off-road racers need parts!

DELTA IN OFF-ROAD . . .

While I was really surprised by it, Delta has taken the plunge into the off-road market as well. They are a distributor for the Yokomo 1/10 car, and in addition are now developing after-market parts for same. My sources say the Yokomo is hot; it has a part-time 4WD setup where all the wheels drive in the turns but down the straight where you need speed and not grip only the rear wheels drive. This results in a car that corners fast, yet will still run down the straights with 2WD cars and will also equal them in running time.

IS THIS THE NEW OFF-ROAD COLUMN?

In a word, no. The off-road cars have always been interesting to me; the only thing that has kept me from being real interested was a definite lack of performance . . . simply going over jumps and tossing a little dirt was not enough. However, today's 1/10 cars do offer pretty fair performance and are getting better all the time. Add in the 1/8 gas-powered off-

roaders that have to offer really dynamite performance and, yeah, I'm starting to get interested and future columns will no doubt reflect this interest . . . At least until our road racing season starts up again this coming spring! Dan Rutherford, 4705 237th Pl. S.E., Bothell, WA 98021 •

Aircoupe . . . . . *Continued from page 16*

flies without any added weight. We DID have one wing heavier than the other... critically poor for such a low aspect ratio wing. It was corrected before the wing was covered. The finished model, when suspended at the wing spar, should balance with the top fuselage longeron EXACTLY horizontal... feel free to move the wing forward or back on the cabane struts to achieve this balance. Twist in the wing's washout at each tip with your heat gun and make the four wing struts to fit. The prototype's wing is mounted to the cabanes with 2-56 x 1/4-inch bolts into blind mounting nuts... but we have yet to remove the wing due to the compact overall size of the model.

Set your control surfaces to move as shown on the plans and you'll have sufficient control for Sunday flying as well as loops, barrel rolls, Immelmans, spins, and YOU'LL EVEN BE ABLE TO FLY THIS LITTLE JEWEL INVERTED THE FULL LENGTH OF YOUR RUNWAY. You'll need about a third of the "down" elevator. Left and right rudder will steer it left and right while inverted.

Flying the AIRCOUPE inverted is a little bit like holding a toothpick vertically... then balancing a king-size BOWLING BALL on TOP of the toothpick's upper tip! It gets a little unsteady inverted... but it's fun. Just leave yourself enough altitude to pull "up" elevator to recover from inverted flight.

The wing is thick enough near its spar to add a fourth servo for ailerons. We opted NOT to use ailerons and we're delighted with the AIRCOUPE'S performance with only three channels. We think you'll be pleased too.

Make believe you're sitting in the real AIRCOUPE... hold full "up" elevator and

advance your throttle. As speed builds, ease off the elevator and steer down the runway. A touch of back pressure will lift you off. Touch-and-go's are a real delight. Hold a bit of back pressure on the stick as she sets down and rolls, to prevent a nose-over...advance the throttle and build airspeed. Steer down the runway's center and ease back slightly and you're back in the air. NEAT, HUH???

So why not send $5.00 to Model Builder Plans Service, Box 10335, Costa Mesa, California 92627-0132 and order plan No. 2851 so you can build your own AIRCOUPE!

If enough model builders like this simple Sunday type of scale R/C model and go ahead and buy the AIRCOUPE plans...this will tell the editor that you want to see more simple Sunday scale R/C models presented in **Model Builder** magazine!

Hannan . . . . . *Continued from page 57*

to anyone interested. The group's emblem is a helmeted and begoggled alligator posing in front of a Travel Air 2000. A lighthearted flavor permeates the publication as indicated by a few abstracts: "Shticks und Tizzue Uber Alles!"..."published exclusively, but hardly taken seriously." The initial issue features plans, 3-views and a kit review, some of which have previously appeared in other newsletters, but more original material is expected in forthcoming issues. Subscriptions cost $7.50 from: Dean McGinnes, HQ Swamp Squadron, Flying Aces Club, 5275 William Clark Road, Lakeland, FL 33805.

TROLLEYS, ANYONE?

Paris, France is famous for its Musee de l'Air Museum, but Perris, California is well-known for its Trolley Museum. In addition to its fascinating collection of rolling stock, it has a remarkable display of model trains of many types. During October, an exhibition of model trolleys was organized by Ken Hamilton for the museum, and it was our good fortune to attend. Like model aircraft builders, trolley modelers are an enthusiastic lot, more than willing to share their knowledge and techniques with each other and spectators. Models displayed ranged in size from very tiny examples to one enormous car which must have measured about four or five feet in length. While some of the trolleys were on static display, others were in regular operation, and complete with operating features. As in other forms of scale models, the accent was on detail, and the craftsmanship and ingenuity shown was to a high standard indeed. Paint schemes and markings were of particular interest and the variety was remarkable.

At the conclusion of the exhibition, the Museum paid tribute to the model builders in a unique way: Each of them was offered the chance to drive a full-size trolley! This turned out to be a bit more demanding than one might anticipate, since skillful coordination of the throttle and brake controls is involved. But thanks to the patient volunteer instructors, everyone managed to test their skills at being a motorman. One model builder who took special delight in this opportunity was Warren Shipp, who had spent over thirty years as a transit policeman in New York City, but had never previously had a chance to try his hand at the helm. Sometimes fantasies *are* fulfilled!

AND AT LAKE ELSINORE

Within a five-minute drive of the Perris Trolley Museum is Lake Elsinore, popular location of water-sports, ultralight flying, and sometimes, model aircraft meets. On this occasion, one day after the trolley meet, Bill Noonan, Robert Noonan, and yours truly attended the Flightmaster Rise-Off-Water meet. Although the turnout was smaller than in previous years, the variety of models included scale jobs powered by glo, diesel, and rubber power, as well as a few Embryo Endurance aircraft fitted with floats. The weather was ideal, and the conditions truly relaxed, resulting in an unusually pleasant outing. R.O.W. meets almost always attract out-of-the-rut entries, and among those noted were Jack McCracken's Gloster Schneider racer, Bill Stroman's Taube, and Henry Frautschy's Turbo-Porter (all the way from Connecticut!) which flew beautifully on its first-ever

flight. Even the trophies were unique, being solid cast-aluminum plaques featuring canards (*real* canards...ducks!) fabricated by Bill Stroman.

During the time the models were in action, it was difficult to avoid watching the ultralights which operate in profusion around Lake Elsinore. These machines particularly fascinated Phyllis Warner, fresh from flying Bill Watson's pedal-powered blimp, and she decided this was the time to do something about it. In no time at all, she was donning helmet and jacket, prior to going aloft in a two-seat Eipper for her first instruction. As all the model builders watched intently, the two-cylinder reduction-drive engine was started, and the machine departed in no uncertain manner, climbing out in a most authoritive way.

Perhaps midway through the flight Phyllis, who is an exceptionally apt pupil, had assumed control of the craft and impressed us all with the smoothness of her piloting. Our congratulations to this charming aviatrix!

BOOK REVIEW

Inevitably there is an overlap of interest between models and full-size aircraft. *Composite Construction for Homebuilt Aircraft* may not seem to be a book useful to aeromodelers, but in light of today's "high-tech" methods, it is well worth reading. Written by Jack Lambie, the information is presented in a thoroughly practical manner with no technical snobbery whatever. Topics covered include the use of foam, paper/glass composites, fiberglass, Kevlar, graphite, polyesters,

epoxies and techniques of mold-making. Also treated are the vital topics of safety and health associated with some of these procedures.

Lambie clearly recognizes the influence of models and their builders as shown by this passage: "In the old days, most airplanes had a very tiny fin and large rudder, which made them more difficult to fly because a lot of rudder had to be used. I believe this was because most of the early plane designers were model airplane builders."

He also understands the importance of philosophy in creativity: "Humans are fascinated by making things smooth and contoured. Statues, monuments, jewelry, and furniture are finished as part of their appeal, not their utility...the finishing 'work' is as delightful as any of the construction of an airplane...recognize that sanding and finishing is truly great fun, but must be well planned and properly done to get the most joy from the process."

We certainly had to agree with Jack's comment that "Weight compounds itself." On aircraft configurations, Lambie had this to say: "All things being equal, neither the canard, tailless, tandem wingers, or biplanes have advantage over the conventional designs, they are of worse performance in every case because of high trim drag."

And in the section on painting: "Remember, the contour is what the air 'sees' and the shine is what you and your friends see."

There are a few amusing boo-boos, such as Jack's reference to the *Polish* ZLIN, but all-in-all we found this book educational and thought-provoking. Added bonuses include 3-view drawings of such craft as the Polliwagen, Molt Taylor Micro Imp and Bullet, Glassair RG, Viking Dragonfly, Vari-Eze, Long-EZ, Gossamer Albatross and Solar Challenger.

By way of summary, Jack Lambie says it all for building aircraft, be they models or full-size: "The greatest cost in an airplane is still the engine and your time. Airplane building is, of course, an enjoyable hobby so we shouldn't have to count our time."

Composite Construction as well as other publications of interest to aero enthusiasts are available from: Aviation Publishers, One Ultralight Way, Box 234, Hummelstown, PA 17036. Write for their catalog, and please tell 'em **Model Builder** sent you.

INTERNATIONAL MODELS

Three Japanese Peanuts arrived at the Hangar recently, after having taken part in the Flamalle, Belgium contest. They are a Lacey M-10 by Shoichi Uchida, constructed from from plans in Ron Williams' recently republished book *Building & Flying Indoor Model Airplanes;* a D.H.53 Humming Bird, by Shiro Takeuchi, from his own plans; and a F.R.E.D. from **Model Builder** plans, constructed by Jiro Sugimoto. To truly appreciate the international aspects of this hobby, let us reflect on this latter model:

F.R.E.D. (*F*lying *R*unabout *E*xperimental *D*esign) was a homebuilt parasol designed in England by Eric Clutton, a well-known aeromodeller. Siegfried Gloeckner of Germany designed the Peanut version published in **Model Builder** (December, 1982). Now then, we have Japanese builder Sugimoto constructing this model, presumably from Ecuadorian balsa wood, and sending it to Belgium for proxy-flying. Fernand Van Hauwaert next forwarded the craft here to California. And oh yes, when test-flown in San Diego, the model was powered by Italian rubber! Truly we have a global hobby...

SIGN OFF

Both Jim Algar of SOARING magazine and Duke Silver found this gem:

"If the only tool you have is a hammer, you tend to see every problem as a nail."
Abraham Maslow

Soaring . . . . . *Continued from page 25*

gories, as well as Junior and Sport Scale classes were flown.

"As Contest Director, my work began with organizing a crew and establishing a comfortable set of boundaries in which the meet would operate smoothly. As this was to be our second large sailplane meet, we had already recruited a fair number of experienced people to help. Ted Davey of Davey Systems Corp. provided us with three sets of his new Pow-R-Zoom winches and Retrievers. As Ted is a Valley Forge club member, almost all of us are familiar with the use of his equipment. Getting good winch operators was a snap, and we came up with twelve pros. Gary Colby was our winchmaster, and he kept things moving so smoothly through the 'funnel' that we often ran out of available frequencies faster than open spots at the winch stations.

"My assistant CD's were Frank Anders and Fran Olix. Fran had just finished directing our US Scale Masters Regional and his help was a nice addition to our staff. Impound was headed by Lisa Miller, who helped at the '83 Nats (Westover) soaring events. Under Lisa was Patti Colby and between them, over a hundred trans-

mitters were properly shuffled around for two days.

"A Valley Forge 'touch' was provided in the way of a monster motorhome complete with computer scoring center and a work table/repair center. Allied Hobbies, a local R/C shop, stocked the repair station with every color of Monokote, all types of glues and epoxies, covering tools, and even pins and rubber bands. Anything you might need to keep your damaged bird flying was at your disposal free of charge! Fortunately, the lines for the work table were never too long, but the service did manage to help a few flyers who might have otherwise had to scratch. First class!

"During Saturday's pilot briefing at 9:00 a.m., the beautiful flying site in Valley Forge National Historical Park was graced with the presence of some 20 hawks circling directly over the field. Launches began at 9:30 in very light winds and gently warming 'green air.' It looked like a great weekend was off to a very good start.

"We weren't disappointed! Launch after launch, contestants were making maxes and, at times, as many as 12 sailplanes were in the sky at once!

"Four rounds of seven-minute international duration with L-4 landings were flown on Saturday, and Sunday was three more rounds plus Sport Scale. This brought our two-day total to almost 900 launches. I don't think we had even a dozen line breaks over the entire weekend. Ted Davey's equipment was flawless and SAFE. No longer is there any need to station line retrieving personnel at the winch turnarounds where they are in danger of moving lines. 'A launch a minute' is a very modest understatement. A full round of 108 fliers took less than one hour and 45 minutes, counting relaunches and frequency availability.

"Sunday morning brought the showers, and it looked as though we might have to scrub. We had gotten four rounds in on Saturday, so we already had a valid contest . . . but, as yet, we had not flown Scale. A vote was taken, and both static judging and scale flying were underway . . . rain and all! Not willing to let that go by unchallenged, ALL decided to brave the water, and Day Two was off and running. Halfway through the first round of the duration competition, rain gave way to sunshine and more good air. This meet was not to be stopped!

"After two days of some very competitive flying we had our winners and the awards ceremony began. Over $1500 in prizes were given away, including six complete radio systems; one each to the first place flyer in each of the six events. LSF had really lovely plaques for the top finishers (down to fifth in Unlimited and fourth in Two Meter) and additional merchandise was provided by Sig, Great Planes, Ace R/C, Astro Flight, and Leisure Electronics. The three local area R/C shops also were very happy to help the cause and each donated at least one sailplane kit. This is co-operation at its best.

"The special Valley Forge Award is a two-foot trophy for fine craftsmanship for which each contestant gets to place a vote. The award is intended to promote a better built class of model for use in general duration events. The concept is a good one, and we feel that if other clubs start to acknowledge the same type of award, pretty soon those ugly ducklings might fade away into some dark and distant closet. Whatever happened to pride in workmanship? This year, at last, the trophy was won by Terry Luckenback for his immaculate ASW 20.

"When the awards were done and the last visitor had left our park, we realized that we had just pulled off one of the largest sailplane contests in the country. The crew went to get some dinner and wind themselves down. We each went home knowing that, of the 108 who came to fly with Valley Forge, none would ever forget this one!"

RESULTS

TWO-METER SPORTSMAN

1	Davey T	2937
2	Dolan B	2843
3	Fraser D	2710
4	Richardson	2668
5	Weger G	2511
6	Border R	2481
7	Proch G	2360
8	Harley B	2331
9	Greve J	2328
10	Swanson S	2253

TWO-METER EXPERT

1	Blanchard W	3170
2	Meleske B	3024
3	Schow S	2740
4	Olix F	2477
5	Harrison J	2446

SCALE

1	Lukenbach T	188
2	Blanchard W	179
3	Radoci J	171
4	Shelkey G	163
5	Trockels E	0

JUNIORS

1	Johnson B	3052
2	Cotter J	2535
3	Border C	2332
4	Smith I	2316
5	Lecuona M	1741

UNLIMITED SPORTSMAN

1	Border R	3079
2	Fraser D	2968
3	Radoci J	2919
4	Buchle E	2914
5	Esbach J	2781
6	Wyckoff S	2703
7	Bushnell W	2686
8	Eckstine J	2683
9	Weger G	2679
10	Anders F	2670

UNLIMITED EXPERT

1	Gold T	3323
2	Schow S	3217
3	Blanchard W	3214
4	White A	3199
5	Meleske B	3154
6	Miller B	3050
7	Zeigenfuse	3014
8	Glaab J	3003
9	Dickey T	2989
10	Shelkey G	2968

Many thanks, Jeff, for sharing this event with the readers of ***Model Builder.*** If any CD's or newsletter editor types out there would like to see their favorite contest in print, then take some black and white photographs (as Jeff did) and write up a small report like the one above. Remember, if you complain that this colum is too "California" and not enough US of A, you have only yourselves to blame . . . I can't afford to go to every meet there is in this big country of ours! And let's not limit reports to meets alone! If you or the club you belong to have something of interest going on (projects, technical breakthroughs, new ideas for club activities . . . ANYTHING), then write about it and share it with us!

CANADIAN LSF'ers NOTE!

As long as we're on the subject of LSF, there is an important notice for all Canadian members. Dave Henshaw, Canadian Coordinator for the LSF north of our borders, wrote in to let us all know that: *"Effective immediately, all Canadian League of Silent Flight applications, performance vouchers, requests for supplies (decals, patches, etc.) shall be made directly to LSF Headquarters, P.O. Box 647, Mudelein, IL 60060. USA. The Canadian Coordinator since 1976 has resigned his office. (Signed) D.E. Henshaw, LSF 1166."*

Anyone wishing to communicate with Dave should write to him at: 2865 Skyline Drive, Windsor, Ontario, CANADA N9E 3A6.

PENNSYLVANIA REVISITED—GLIDER MODS

Quite awhile ago I received a very nice letter from Rick Rodgers, of Pottstown, Pennsylvania, concerning the H-P program for plotting airfoils that Daryl Butcher designed, and concerning some modifications that Rick has done to the Balsa U.S.A. *Nomad* glider. As this info could be readily adapted to other similar

designs, I thought it would be good to include in the column.

"Dear Bill,

"Your column in the February '83 MB *had a great deal of good information. I really enjoyed the article and thought I would let you know what at least one southeast Pennsylvania glider guider is up to.*

"First things first, however, I would appreciate receiving a copy of Daryl Butcher's computer program to generate and draw airfoils. I have access to a Hewlett-Packard 1000 series computer at work, and I have permission to do 'government jobs' after hours. I would also like some way to contact Daryl in case I have some problems with the program."

At this point I would like to interject that I will still supply interested parties with copies of this program if they will send me a self-addressed stamped envelope and one dollar to cover the cost of copying. Now back to Rick.

"I have progressed to the point where I am designing my own sailplanes, but I am doing extensive modifications to one of the more reasonably priced sailplane kits, the Nomad *by Balsa U.S.A. I have been working with this sailplane for the past few years. I started with a stock-built* Nomad *in 1982. The wing attachment seemed a little weak to me, and one afternoon a heavy toe (sic) on the winch managed to remove the right wing panel from the rest of the ship. Needless to say it was 'back to the building board.'*

"I decided to stay with the Nomad *kit and make modifications as required. The* Nomad *has good stability, so reasonable modifications were not risky.*

"I consulted with my fellow fliers in the Daniel Boone Silent Flyers R/C Sailplane Club in Reading, Pennsylvania. Jerry Zeigenfuse, the club president, was ready with numerous suggestions. The modifications included: completely boxing in the wing rod tubes, a la the Airtronics Aquila*; going to 1/4-inch main wing rods; fully sheeting the center section and leading edge of the wing (instead of the stock turbulators); adding about 3/8-inch of Phillips entry; removing the rudder's overbalance area (making it part of the stationary fin); installing spoilers; and from Jim Ealy came the suggestion to add drag spars. All these modifications may sound like a lot of added weight, but the ready-to-fly weight of this highly modified* Nomad *was only a little over 50 ounces.*

"I flew this ship through the 1983 season, taking a third place in the first contest . . . 1983 went well for me. That year I managed one first place, one second place, and three third places in our club contests. I'm also proud to say that my standing in the club jumped from 16th in 1982 to second in 1983 (Jerry was first). I also competed in several of the regional sailplane contests and placed fairly well considering my lack of experience in very large (60 to 80 fliers) contests.

"This summer (1983) seemed to be the 'windy weekend' season. The Phillips entry in the wing helped somewhat with penetration, but the sailplane did not seem to penetrate as well as it could have. Even so, my standing in the Eastern Soaring League (ESL) Sportsman Class jumped from 103rd in 1982 to 33rd in 1983.

"I am now in the process of building a second modified Nomad. *All the previous mods will remain, but I plan on using an Eppler 193 as the airfoil and stretching the wings to 110 inches. The empennage will sport a stabilator and the fuselage will be just a bit wider to allow easier installation of the fairly large servos I have on hand. These changes should produce a good thermal ship with a thinner wing which hopefully will enhance the penetration. Logically, it should.*

"My mentor, Jerry, reminded me that the frontal area has a lot to do with the drag. Cut down the frontal area and the drag will also be reduced. Then he pointed out that the wing is the biggest frontal area for a sailplane. Calculate it out. By reducing the thickness of a 100-inch span wing by 1/8 of an inch, a 10% reduction (for the Nomad*) in frontal area (12.5 square inches) is realized. Amazing! The E-193 seems to fill the requirement for my application. Also, a lot of the F3B pilots seem to be using this airfoil with good results.*

"Well, I have to get back to the shop. It's January already and spring is fast approaching. I'll let you know how the mods work out. Thanks again for the computer program. Perhaps we will meet at

the 1985 Nats.

"Sincerely yours, Rick Rodgers."

Thank you for your valuable input, Rick. By changing the stock *Nomad* around the way you have, you have completely changed its flying characteristics. Especially the E-193 mod! Not only have you reduced frontal area, but as both airfoils are basically flat-bottomed, by going to less thickness you have reduced *camber* which will make the plane even less of a "floater" and more like a "streaker" (if you remember who *they* were!). By all means, Rick, let us know how that mod turned out!

For those readers out there who are not familiar with the term "Phillips entry," please refer to the sketch on the opening pages of this column.

NEXT MONTH . . .

Who knows what there will be next month?!! I do, but I'm not telling! You'll just have to buy next month's magazine to find out.

Until then, green air to you all and just have fun, OK?

Bill Forrey, 5815 E. La Palma, Number 281, Anaheim Hills, CA 92807. Please correct all old mailing lists, thank you. •

R/C Boats . . *Continued from page 29*

reverse controller provided in the kit works fine, but doesn't allow any variation in speed. This is especially noticeable when using reverse. The reverse speed is much too fast, and the boat is difficult to control while being operated in reverse. A variable speed control is an optional item that can be installed easily. There are a number of speed controls available ranging from $20.00 to over $100. I have noticed that Robbie Models has a selection of controllers that would work well with this boat.

I've been having so much fun running and allowing others to run the "40 Baltic" that I have yet to finish installing the deck and cabin fittings. At this time, I'm considering holding off on all the fancy fittings because the boat is getting so much use. All those fittings are nice looking but I also know how easily they can be broken by little hands trying to help launch or take the boat out of the water. I know the boat is durable because it's already received its share of bumps and bashes. For the modeler seeking scale realism, the addition of the fittings completes an already beautiful model boat.

FUTABA'S MAGNUM JUNIOR

When Futaba introduced its Magnum series a little over a year ago I didn't pay that much attention to the system. I saw one of the transmitters and couldn't see the need for all those dials and devices. As I understand it, the first Magnums were basically intended for the car guys. I guess they need more adjustments than we do for model boating.

Recently, Futaba released what they are calling their Magnum Junior series. It is available in either a pistol grip/wheel or stick transmitter configuration. Although I have many friends who would argue the point, I personally do not see why anyone who is going to run a boat or drive a R/C car would want to use anything other than a pistrol grip/wheel transmitter if they have not already purchased radio equipment. The Junior series certainly has all the features I think are needed for model boating. I really like the servo reverse that is now available on many radios, including the Junior. There are adjustments available for throttle control. One feature that I especially like is the steering rate adjustment located for easy use on the grip handle.

Although the Magnum Junior I received came with the pencell battery packs, I converted mine to Ni-Cds using batteries I had in other Futaba radios. I recommend the use of Ni-Cds because they are going to more than pay for the additional cost when used over a period of time.

I have only had the opportunity to use the Magnum Junior in two electric boats. I've already mentioned its use in the "40 Baltic." I've also used it in a Model Racing Products "Pantera." The radio has proven to be dependable in these two applications. I hope to give the system a try in my 7.5 tunnel in the near future. The advantage of this type of system over my older wheel radios is most apparent.

Jerry Dunlap, 119 Crestwood Dr., S.W., Tacoma, WA 98498 •

Hiperlight . . . . *Continued from page 52*

cated. Competitive flyers will undoubtedly add a few inches as they (Mooney-like pun coming) will go to any lengths for more duration. Test over grass with an initial fifty turns, hand-launching slowly in a very slight climb. Rebalance and trim, based on what you see ("I think it made *that* hole!") and continue increasing the winds. It has been a laterally stable little plane, with the realistic flight characteristics of the real Hiperlight, and should give you enjoyment in sport flying. Your comments and suggestions sent in care of **Model Builder** will be most welcomed by this long-time-away old timer.

I wish to thank the model builders I met in California for making my "return" full of warm companionship. Special thanks to Sal Taibi, Dick Howard, Cliff Silva, and Bill Hannan.

And not to forget publisher Bill Northrop who really *FLAME* broils steaks, and his lovely Anita who efficiently puts out the associated conflagration!

Hope to see all of you...and more...in the future. •

Sky Rally . . . . *Continued from page 21*

for the rigging. Add on the pressure sensitive decals provided, and the wing is complete.

The radio system used is the Cox two-channel. The radio system comes complete with receiver, battery case, two servos, switch harness, and frequency flag. You must purchase 12 batteries to power the unit, eight for the transmitter and four for the flight pack. Alkaline batteries will work fine, but over a long period, rechargeable Ni-Cds might be a better investment.

Secure the receiver and two servos in place with the double-sided tape provided. Check and make sure servos are traveling in the right direction before final installation. The push rods are pre-formed and the correct length. Fasten the horns in place and radio installation is complete except for securing the switch harness and battery pack. The receiver antenna is quite long. Do not cut short, leave full length.

With the radio completely installed, place the wing in position and fasten with rubber bands.

Now the rigging can be done. In the center of the wing is a hole for the aluminum vertical post. Push in place and install the plastic eyelet on top of the post. Refer to instruction manual on how to rig the SKY RALLY. All rigging is nylon cord and tension is held with tension bars provided.

With everything about done, you're ready for the trip to the flying field and the "moment of truth."

If this is your first try at R/C flying, do get an experienced flyer to go with you. That other pair of hands can be very comforting.

Make sure the radio system is working properly and all servos are moving the surfaces in the correct direction.

A little prime of glow fuel in the engine, hook on the starting battery, and turn the prop in a counter-clockwise direction to wind starting spring. Let go of prop and the little Cox .049 will come to life. Adjust the needle valve for max power. Turn the radio system on. Check functions and have helper give a gentle toss into the wind. (Do not attempt to fly on a windy day). The SKY RALLy will be on its own climbing straight out to an altitude that feels comfortable. Without a throttle, all flying must be done at full throttle. Gen-

tle turns and a little up elevator keep you at a safe altitude The SKY RALLY is a real fun flyer and with its small fuel tank, stays aloft for quite a long time. Without the power, you have a small glider on your hands, coming back gracefully and ready for another flight. Give it another drink of fuel and you're ready to go to the skys again You might say it's a real change of pace.

TRY ONE, YOU'LL ENJOY IT!! •

Electric Fly . . . *Continued from page 45*

fle apparently is a very important part of KRC's annual activity. It was KRC's wish to pass along their sincere appreciation to the hobby industry for their support because, as a small club, they would be incapable of such an undertaking as their "Annual Electric Fly" single handedly

Owing to the success of last year, the Saturday Evening Informal Social has become another tradition. The Hatfield American Legion Hall, the KRC's regular meeting place, was the scene for hours of friendly socializing following a super Saturday The KRC ladies outdid themselves with lavish dishes while the KRC gentlemen provided plenty of suds to wash down the delectable Pennsylvania style food. The social was as equally well organized as the day's activities.

In the words of the noted electric flyer and Contest Director, Bob Kopski, "Well, it was a virtual explosion of electric accomplishment and excitement for everyone! Where else could you see 52 participants with an average of two R/C electrics each! All kinds, all sizes, all fun!"

A summary of the results will be found in Mitch Polings *Electric Power* column •

Electronics . . *Continued from page 33*

able modules, you've got your choice of:

1. No. 96400: Elevon and V-Tail mixing requirements. Mixes elevator and aileron functions, for flying wings and V-tails.

2. No. 96401: Elevator/Flap Coupler. This one adds elevator to compensate for the nose up that usually occurs when wing flaps are lowered. The ratio of elevator to flap movement is adjustable at the module.

3. No. 96402: Elevator/Spoiler Coupler. Similar to the Elevator/Flap module described above, except that coupling takes place between the elevator and throttle channel; the latter often used as a Spoiler (Speed) control in sailplanes.

4. No. 96403: Flaperon Module. This one mixes ailerons and Aux II, for normal aileron action, plus flap action with the aux channel.

All these mixers are readily installed or interchangeable at the field, and none of them require any adjustments to the transmitter. You can fly a mixer equipped airplane, remove the mixer and fly another one sans mixing. Isn't modern technology wonderful?

NEED A SHRINK?

We all do sooner or later, though I don't mean the $100 an hour kind. I'm referring to that heat shrinkable plastic material now finding so many uses in our hobby. One such use, a rather unusual one I think, is that helicopter flyers are using it as a quick but durable covering for rotor blades, both the main as well as the tail rotors. What this means to us electronics tinkerers is that it has made available a source of extremely light material most useful for making up our own battery packs and otherwise for many protecting and insulating chores.

This skinny shrink is available in two sizes. Measured flat, one is 1.25 inches wide, the other is 2.35 inches, in lengths of 18 inches and 5 feet respectively. It is available in black, transparent orange, and in the case of the small size only, white. The price is $1.30 for the small; $1.95 for the large, from the one source which I know of, and that is California Model Imports, P.O. Box 1695, Garden Grove, CA 92642, (714) 991-1720. There is a $2 minimum postage and handling charge for mail orders, which will probably take care of a couple of each size.

To use, simply cut a length slightly longer than whatever you wish to cover, slip it over the object, and cook it slightly with your heat gun! Professional looking . . . I guess!

TOMORROW'S BATTERIES

One of our readers, a Mr. Erick Immel, El Cerrito, California, sent in a newspaper clipping which talks about a new kind of battery that we may be using in our R/C equipment someday. Made entirely of plastic, this new battery is lighter, and may eventually cost as little as one-tenth what we now pay for Ni-Cds.

Apparently now in the development stage, this new plastic power-pack is the brainchild of a group of scientists at the University of Pennsylvania, in Philadelphia, according to Dr. Alan MacDiarmid there. The plastics used are something called conduction polymers, and instead of corrosive sulphuric acids, the electrolyte used is plain water. Thus other side benefits are that the cells are non-toxic and non-flammable, unlike lead-acid and Ni-Cd cells.

Dr. MacDiarmid is quoted as saying that they expect to be able to produce rechargeable batteries at the price we now pay for non-rechargeable ones, and that he believes their first application to be in toys. I don't know if he means *our* toys, but we're certainly interested!

DOWN ELEVATOR GLITCHES

This is not exactly a new subject to me, but it was recently brought to mind by a conversation at the flying field. I have had two glider flying friends, both flying similar R/C systems, insist that their particular brand of radio was prone to down elevator glitches, but that they knew the cure!

Knowing that the position of the servo is determined by a pot in the transmitter actuated by the stick position, which in turn controls the length of the control pulse, they theorized that, for example, if a shortened pulse drove the servo to down elevator, reversing the connections on the pot so that a shortened pulse would result in up elevator would be better. In theory, an up glitch is always more desirable than a down glitch! I agreed that, yes, their reasoning as far as control pulse lengths was correct, but that the pot itself might not be at fault, and that reversing the pulse direction was not the answer . . . the actual reason for the glitch should be located and corrected.

I also tried to explain that the system might be glitching in more ways than in down elevator, but that some rapid control surface movements, such as a fast right/left rudder, or a short up elevator movement would simply cancel out, not be noticed, or thought to be the effects of air currents.

Well, nothing would do but that these two individuals, unknown to each other and at different times, rewired the elevator pots in their transmitters to reverse the pulse direction . . . and continued to get down elevator glitches!

It is obvious that a glider, as well as a power plane, is going to be more responsive to down elevator movement than to any other. Remember that your R/C service technician has to see a fault before he can correct it, and in the case of intermittents or glitch problems, the more information you can give him, the better his chances of being able to help you. If you are getting hits of down elevator, fly around inverted for a while. If you are also getting up glitches, they will now be more noticeable, as down, and you can report elevator movements rather than just down elevator movements.

There is one exception to the above, that might be helped by reversing the pot wiring. That is if the pot itself has a dirty or worn spot in one direction off center stick position. Reversing the connections will probably put you in a completely different section of the pot, and the problem will probably disappear. However, this type of problem will show up as erratic servo movements every time you move the stick past the defective pot area, and seldom as a glitch at odd times with no control input.

There is a caution to be observed. Reversing the pot wiring, especially on older transmitters, will often upset the pulse train in the encoder so that channels other than the one on which the wiring

change was made are affected. The rewired pot has to be adjusted properly to correct this, sometimes difficult to do even with a scope to view the control pulse train on. A digital pulse meter is also a big help in resetting the channel back to its original timing.

Well, it's winter again! Here by the Pacific, it's time to wrap up another month's writings and get my stuff on charge for tomorrow's flying . . . sure hope you are able to say the same! •

Dear Jake . . . . . *Continued from page 7*

Dear Jake:

Engine wise, what's the difference between Perry porting, Schneurle porting, and loop scavenging?

Confused in Carbondale

Dear Confused:

Perry ported and Schneurle ported engines both have boost ports as well as intake and exhaust ports. A loop scavenged engine has only intake and exhaust ports. Perry porting is named for its inventor, Sir Reginald Perry of Great Britain, as is Schneurle porting in honor of Otto Schneurle of Germany. Loop Scavening is a distortion of Lupe Scavengini, a fleet follower who could be found in every port.

Jake

★ ★ ★

Dear Jake:

I've been building model airplanes since the '30s. Guys like Korda, Goldberg, and Lanzo have always been like Gods to me. As far as I'm concerned, they walk on water.

My question is; if they are Gods, how do they take a bath?

Leery in Laredo

Dear Leery:

You raise the age old paradox: If one can walk on water, then how can one immerse oneself to bathe in it? The answer is precisely the same as that for another ancient riddle: If fleet footed Mercury is trying to outrun a tortoise, and he gains half the distance of ground between them in each increment of time, why can he never overtake his quarry? The philosophically correct answer in both instances is — "beats me."

Jake

★ ★ ★

Dear Jake:

How do airplane designers come up with names for their new creations?

Name Dropper in Natchez

Dear Name Dropper:

Some people just think up something that sounds nice. Others go through the dictionary hoping for inspiration. Some designers like a name so much that they stick with it and keep adding numbers to it, i.e. the Phoenix 8. When I name a new design, I try to look at the airplane and let its appearance trigger some response in my brain that leads to a name. In that way, the airplane almost names itself. Perhaps you've seen plans for my latest design, the 'Green Manure Bucket'.

Jake

★ ★ ★

Dear Jake:

I read in a Canadian medical journal that a study at McGill University has shown that your column causes brain damage in laboratory rats. Would you care to dispute those findings?

Professor in Port Huron

Dear Professor:

I can't deny the University's conclusions because I have my own evidence that they are true. One of those rats wrote me and asked if he could use a Fox 36 in his EU-1. Now if that's not brain damage, then I don't know what is.

Jake

★ ★ ★

Dear Jake:

Why is a propellor sometimes referred to as an airscrew?

Curious in Coolidge

Dear Curious:

Propellor is an obsolete definition of the word airscrew dating back to the dirigible era. Nowadays an airscrew is when an airline charges you $269 to fly from Cleveland to Buffalo.

Jake

★ ★ ★

Dear Jake:

Hi. It's me, Tommy Smith, again. I don't know how I get into so much trouble, but it sure seems like I do. My two-ounce bottle of Super Glue was clogged and I couldn't get it open with a pin, so I squeezed it real hard. It finally popped open, but a big stream squirted out and doused our canary. That knocked him off

his perch and he fell into the seed feeder. Now he looks like one of those suet seed balls you hang outside in the winter. What should I do?

Tommy Smith

Dear Tommy:
Hang him outside, I guess.

Jake

★ ★ ★

Dear Jake:

My little boy Tommy likes to build model airplanes, but so far most of his efforts have been disastrous. Last year I had to take him to the emergency room to get some glue removed from his face. Then just before Christmas he accidentally painted our dog. And now, I haven't seen our canary for two days. I haven't even asked him about that one yet, but I'll bet you his modeling had something to do with it. I really want him to have a hobby, but do you think you could suggest a safer one?

Mrs. Smith

Dear Mrs. Smith:
I'm familiar with Tommy and his endeavors and I agree that you should encourage him to try something else. If he has a birthday coming up, why don't you buy him a chemistry set. If you or your husband have a birthday coming up, why don't you buy yourselves more insurance.

Jake

Workbench . . . . *Continued from page 7*

33⅓ feet. The crew will be Jeana Yeager and Dick Rutan, both taking turns at flying in the small cockpit and resting in the 7½ foot long cabin

For warm-up flights to the major record attempt, the Voyager is scheduled to try the F.A.I. Closed Course record, which requires staying aloft five days. Later, in 1985, a straight-line record will be attempted in a non-stop flight from Puerto Rico to Australia. The Voyager and crew hope to go for the *BIG ONE* before January of 1986. Modelers now have an even better reason for cheering it on!

★ ★ ★

We've just been afforded the opportunity to examine at first hand a rather unusual scale kit. It's the 1½-inch to the foot AT-6, or SNJ, or Harvard, North American military trainer produced by Great Lakes Model Co., 100 Michigan Ave., AuGres, MI 48703, phone 517-876-7825 (ask for Dick Maher)

As the ad states, all major components are molded urethane foam. Right here is where some confusion probably exists.

When the average person reads "foam," particularly a modeler, they immediately think of the course, soft, beaded white foam which is seen in less expensive, mass-produced "foamie" models. Urethane, however, is much denser, much sturdier, and has a hard outer shell that reproduces finer detail. It can also be glued with just about anything, including epoxies and cyanoacrylates. All parts in the Great Lakes kit, including the fin, rudder, stab, elevators, wings, and ailerons, are urethane molded. The fuselage and

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* * *

What is this modeling world coming to?

Several months ago we published a product review on the Champion Model Aeroplane Co. kit for Sal Taibi's popular Powerhouse Old Timer design. In the review, by Randy Wrisley, Randy commented negatively about "die-crunched" ribs and about the plans not showing R/C installation and only one wing panel. Neither Bob Peru, of Champion Model Aeroplane Co., nor Model Builder really gave it too much thought, as over the years, these have been "features" of all but a few special and low production kits.

For as long back as we can remember, plans have shown only one wing panel. It was Steve Kowalik, back in the thirties, who told me how to apply 3-in-1 oil at all rib-and-spar intersections on a wing plan, so the paper would become transparent and you could flip the plan over and build the other wing half. He also told me to rub soap on the places where glue might stick the frame to the plans . . . in case the pantry was out of waxed paper.

As for showing R/C installation, that's really of questionable value. Old Timer models were all free flight, and to accurately reproduce them today, that's the way you show them on the plans. If you want R/C, and most of us prefer that these days, rather than risk loss and destruction in the more crowded environment in which we live, you're really on your own. Every modeler has his pet method and who knows what radio.

"Die-smashed" or "die-crunched" parts have been with us a long time too. The expressions are all too commonly used as compared to "machine cut," and normally, machine cut parts should be better looking. As far as accuracy is concerned, that's up to the manufacturer and not necessarily common to either style. Whether printed, die-cut, or machine cut, we've always expected to have to do a little trimming to make things fit properly.

What really astounded both of us was a letter from a long-time free flighter (aren't these supposed to be the "real" modelers?), and at one time a top officer in AMA's volunteer organization, who indicated he would like to build a Powerhouse from the kit "when these shortcomings are rectified." Come on now . . . is pouring a bottle of glue into a kit box, shaking the box well, and having a completed model pop out, supposed to become a reality instead of a far-out joke?

MOVING?

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cowl is too, but these parts are also shielded in high impact styrene plastic.

Your average foam and fiberglass kit normally includes a glass fuselage, foam cores for the flying surfaces, some with skin, and some without, and maybe a few other odds and ends. The T-6 kit, however, is almost a one-shot shopping item. Hinges, rods, fittings, wheels, light covers, detailed canopy (that can be made to slide open), engine "T" mounts, nuts, bolts, bell cranks, horns, cable, tubing, couplers, canopy rail, etc. are all included. The 20-page instruction book contains detailed sketches, photos, seven pages of text, and seems to cover everything.

A Great Lakes T-6 review is in the works right now, so watch for it in the near-future.

PLANS CATALOG

ILLUSTRATED LISTING OF MODEL BUILDER PLANS

Continuation of our complete Full-Size Plans List, with an illustration of each model listed.

See the regular Full Size Plans advertisement for ordering instructions and special sales.

No. 3742 LITTLE GEM $3.00
Winning QM racer from Sig Doubler kit. By Austin Leftwich and Brad Shepherd.

No. 374-O.T. POWERHOUSE .020 $2.50
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Graceful 12' T-tail R/C soarer. All wood framework. By Glenn Cunningham.

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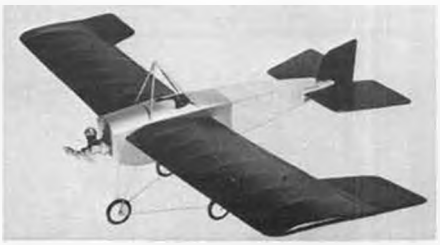

No. 5741 LINCOLN BEACHEY $2.00
Semi-scale .020 sport free flight of well known early-bird stunter. By Art Reiners.

No. 574-O.T. The T-D COUPE $5.00
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No. 8742 AMERICAN YANKEE $2.50
All sheet balsa 1/2A profile C/L scale. Sport or Proto Profile. By Bob Sargent.

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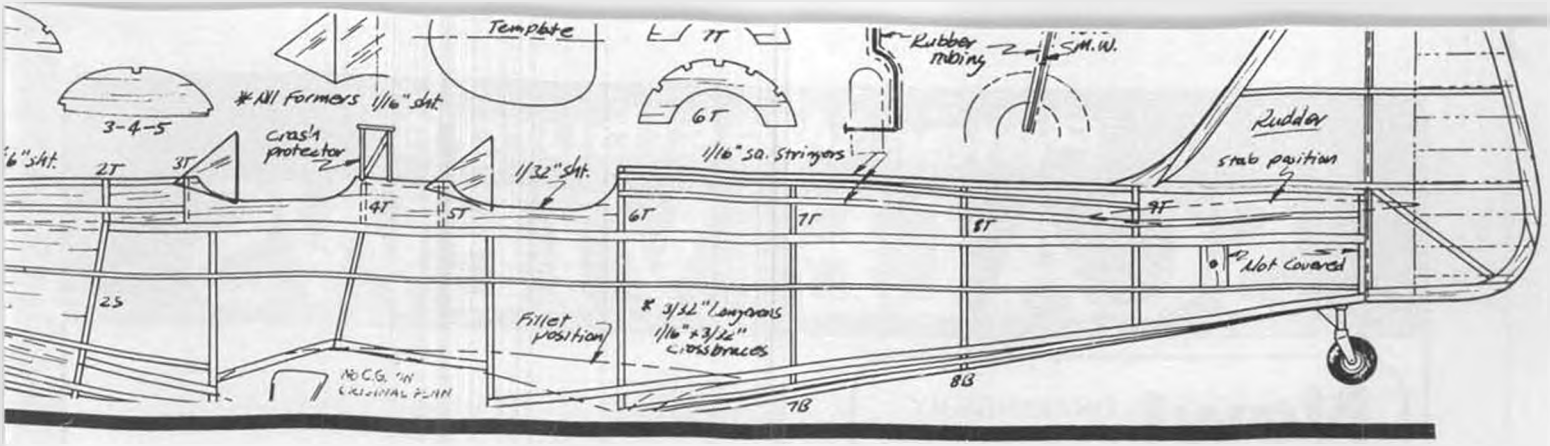
Rubber scale ship for floats or trike gear. Great flier, 26" span. By Walt Mooney.



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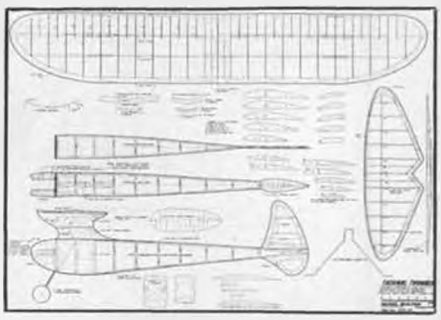

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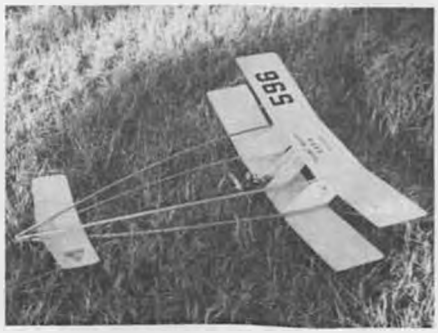

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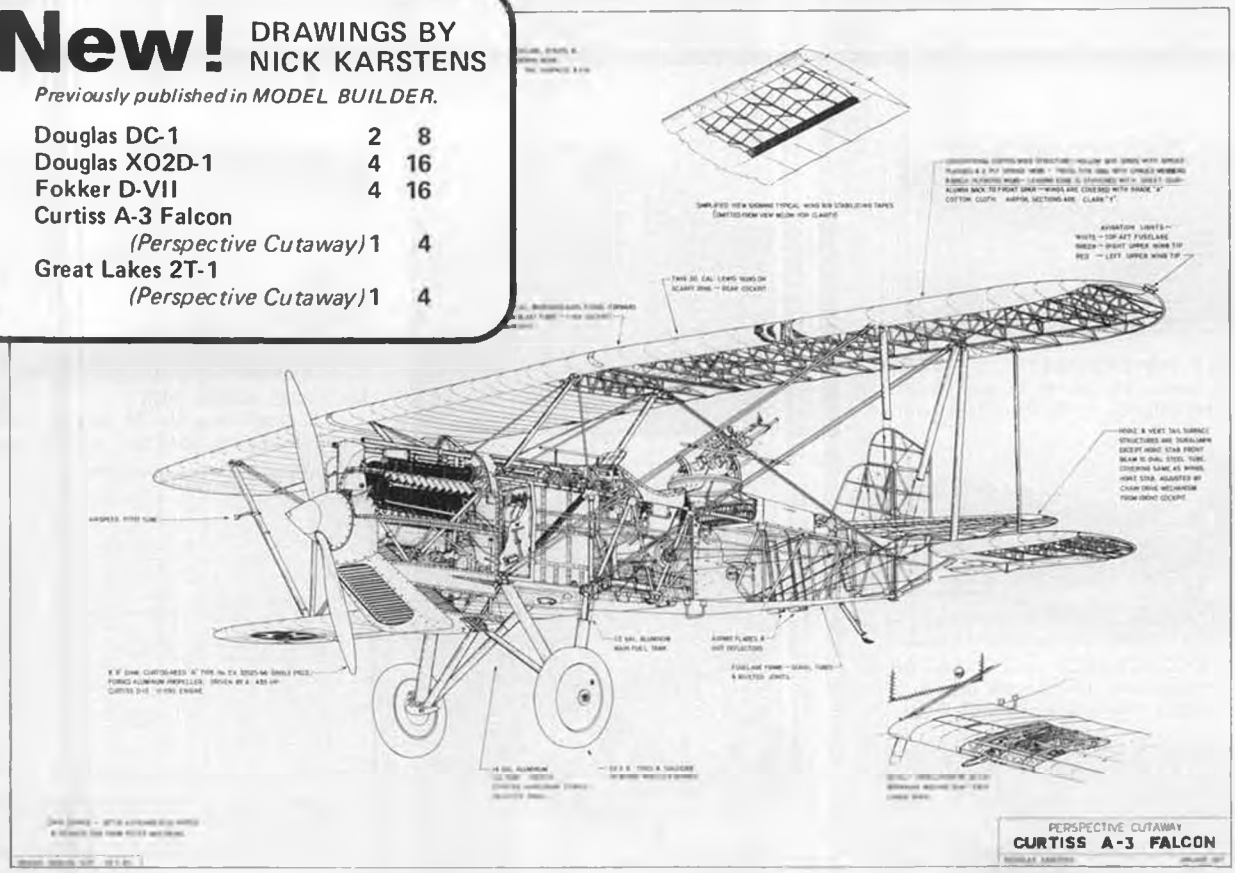

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No. 784-O.T. FAIRCHILD PT-19 $3.00
Rubber powered scale model from 1940 *Air Trails*. 23 inch span. By Earl Stahl.

No. 6841 SPRINT 7.5 $9.00
A modern outboard tunnel hull racer for 7.5 cc Class. 2 sheet plan. Jerry Dunlap.

No. 6842 WYNDIGO $4.50
A 50-in. aerobatic slope glider for 2-ch. R/C. Light and agile. By Pete Roehling.

No. 684-O.T. SCRAPPY $5.50
A 62-inch, high wing cabin model from May 1939 *Flying Aces*. By Ray Heit.

No. 5841 PT-1 FLOAT PLANE $6.50
Semi-scale Consolidated PT-1 on floats. 4-ch R/C bipe, 42" span. George Wilson.

No. 584-O.T. R/C TLUSH MITE $5.00
The 1938 *Mite* at 125%. Spans 62.5 in., 450 sq. in., for 020 - 05 elec. R. Wrisley.

No. 4841 WEEKEND WONDERS $4.00
A pair of 1/2A, 2-ch., R/C flying wings, based on Ace "foamies". Bruce Tharpe.

No. 4842 BIG BIRD, THE E. T. $5.00
Peck's Prairie Bird blown up to 50" span for electric powered R/C. By Larry Jolly.

No. 484-O.T. HI-CLIMBER $3.00
A classic 30" span sport rubber model from Aug. '39 Flying Aces. Earl Stahl.

No. 3841 FABRE HYDRAVION $15.00
RC Standoff Scale 1910 canard seaplane for .10 glow. 69 in. span. F. Reynolds.

No. 384-O.T. CLOUD CRUISER $6.00
Parasol wing O/T from July '37 MAN, 72" span, looks scale-like. Harry Moyer.

No. 3842 HANG-IN-THERE $4.00
Coupe d'Hiver FF model. Features rolled balsa fuse, folding prop. By E. Schick.

No. 2841 BITTY—BIPE $5.00
A small, but exciting R/C sport biplane for .10 to .20 glow. By "Doc" Edwards.

No. 2842 VOLTS WAGON $5.50
A 54" span, 430 sq" area, 05 electric powered, sport R/C plane. Woody Woodward.

No. 284-OT THE DIAMOND $4.00
Rubber O/T with diamond fuse, 150 sq. in. wing, from Oct. '37 *AT*. Roy Wriston.

No. 2843 THE CRACKER JACK $4.00
F/F Rub. or CO_2 Scale, high wing homebuilt; 26" span, 86" area. Walt Mooney.

No. 1841 SUNRISE 2540 $9.00
Mild-mannered, low-wing, R/C trainer for .25 to .40 glow engines. By Buzz Waltz.

No. 1842 OHM-Y-GOSH $5.00
Sporty 05 electric Pylon racer. Wing area is 300 sq. in., span, 38 in. Dave Katagiri.

No. 184-OT 1/2A BRIGIDIER $5.00
An 1/2A Tex. version of the Berkeley kit scaled to 82% for R/C. By Jim Reynolds.

No. 12831 NIEUPORT 11-C $9.00
WW-I triplane for Standoff R/C scale, 4-channel, two-inch scale. By Frank Hoffer.

No. 12832 FAST EDDIE $5.00
05 Electric pylon/aerobatic plane in 29, 34, 38-in spans; 3-ch R/C. By Bob Sliff.

No. 1283-O.T. KARASU $2.00
Rubber powered, 19th century antique from Japan; 21" span. By Danny Sheelds.

No. 12833 VERVILLE AIR COACH $2.50
F/F Rubber Scale Golden Age high wing monoplane; 26 in span. By Walt Mooney.

No. 11831 HAWKER FURY $12.50
Classic British biplane in 1/4 scale, for Quadra or equiv. power. Don Prentice.

No. 11832 FLYING FLEA $4.50
R/C scale model of original HM-14 'Pou de Ciel'. Span 44". By Randy Wrisley.

No. 1183-O.T. ARUP FLYING WING $2.00
Flying scale rubber powered model from Sept. '36 M.A.N. By Gordon Englehart.

No. 10831 RUSS. MISSILE BOAT $6.00
Missile-firing, scale Russian attack boat, OSA class. 2 or 3-ch. By Walt Musciano.

No. 10832 CITABRIA $5.00
Semi-scale Citabria for 05 electrics. Span: 54 in., 2, 3, or 4-ch. R/C. By Stan Wilson.

No. 1083-O.T. WEDGY $5.00
"A" Nats winner in '40. Wedge-shape fuse, builds easily, 42 in. span. Leon Shulman.

No. 9831 BUHL AIRSEDAN $4.00
Unusual .049 powered, 36" span, 2-3 chan. scale sesquiplane from '28. By Jon McPhee.

No. 9832 LIL' WHISTLER $5.00
05 Electric powered fun plane. Span 42". Aerobatic polyhedral design, Larry Jolly.

No. 983-O.T. CORONET $5.00
Class A or B cabin. Span 46.5", area 300 sq. in. for .10-size engines. Appeared in 1941.

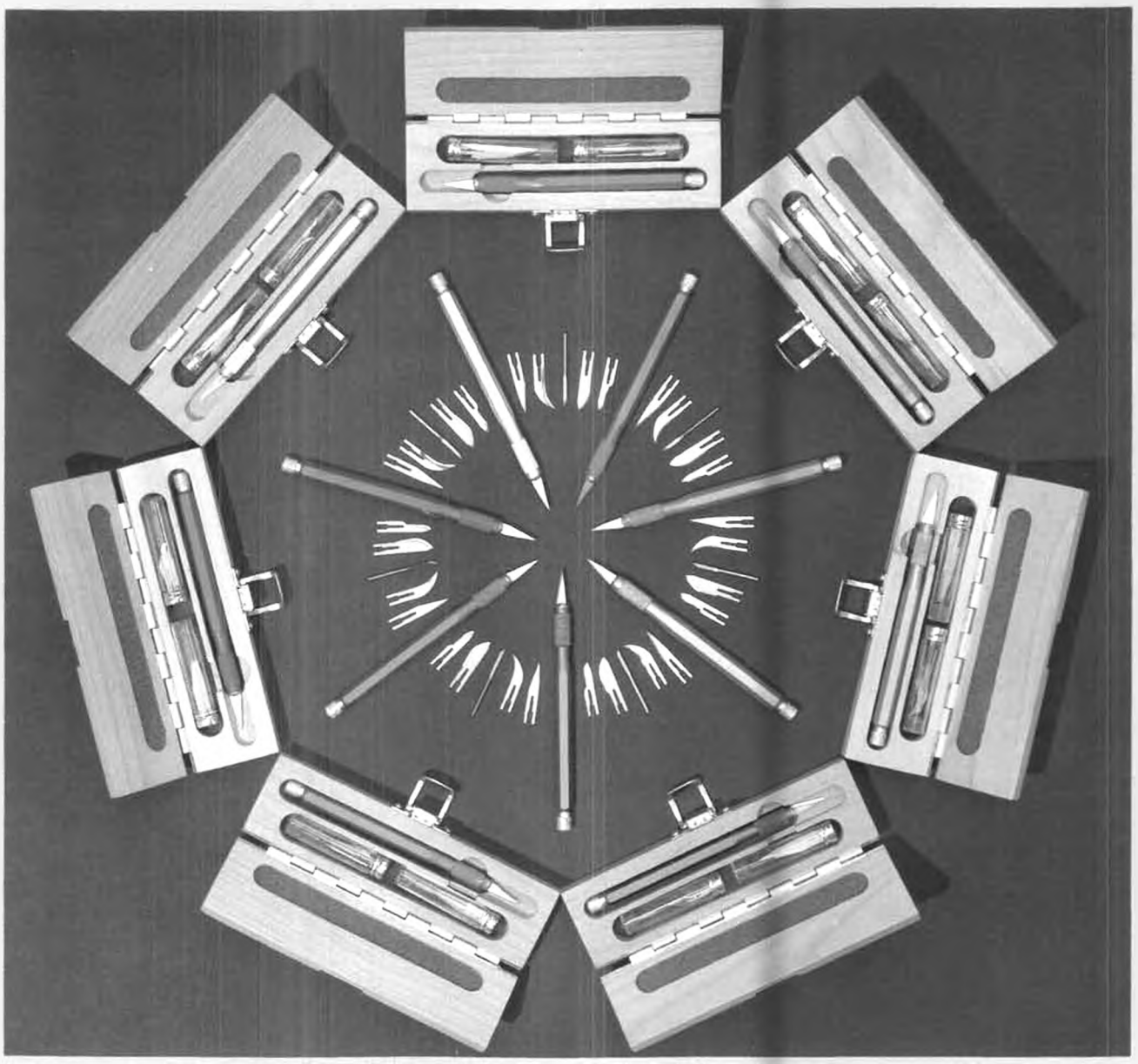
No. 8831 NORTHROP N9M-A $5.00
Scale flying wing. Twin 05 elec. power, 4-chan. R/C, 75-in. span. By Bill Young.

No. 883-O.T. FLYING MIDGET $4.00
Petrides/Abzug design from August '37 M.A.N. For Brown Jr. engine. 49" span.

No. 7831 EPI-SUE $3.50
A sport R/C pusher/canard for .20 to .29 engines and 3-ch. radio. By Dom Apikos.

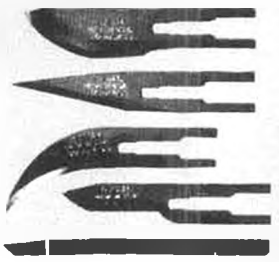
No. 7832 THE BIPE $4.00
Hal deBolt's early post war control line kit bipe for .29 to .60 ignition engines.

IN THE BEST CIRCLES, IT'S **über skiver**



A PRECISION INSTRUMENT FOR THE DISCRIMINATING MODELER

- *Safe, Rear Draw-Bar Clutch*
- *Precision, Instrument-Quality Materials*
- *Strong-Holding Advanced Collet Design*
- *Non-Rolling Hex Cross-Section*
- *Deeply Knurled, Non-Slip Grip*
- *Long-Life, Stainless, Surgical Steel Blades*



Available in seven satin anodized handle colors silver, blue, red, green, gold, black, & violet. Complete set in fitted hardwood case, includes uber Skiver, together with two vials containing four No. 11, and one each of Nos. 10, 12, 15, and 20 . . . . . $16.95
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Vial of 6 blades (No. 10, 11, or 15) $3.00
(No. 12 or 20) $4.00

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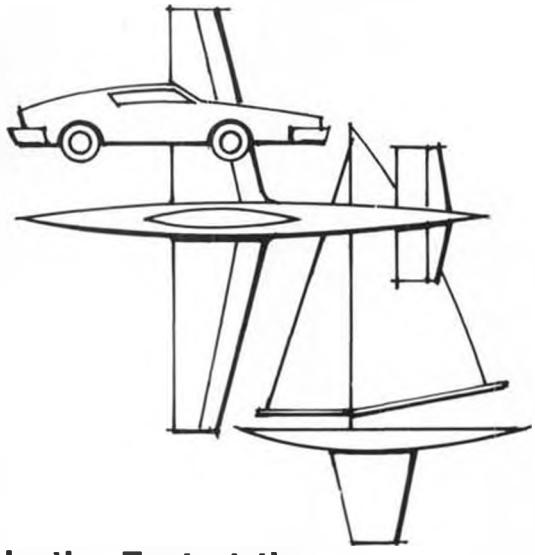
WRAM SHOW '85



Don't miss the greatest Radio Control Show in the East at the Westchester County Center, White Plains, N.Y. It's our 17th annual show and it's sure to be the biggest and best ever!

This year's WRAM Show is going to be the largest yet. Well over 150 manufacturers and other exhibitors have already signed up to bring you everything that's new in the hobby . . . kits, engines, radios, accessories and everything in between. And, our famous Swap Shop will be in full operation with thousands of items, including built-up planes, almost new radios, engines and on and on and on with something for just about everyone.

ADVANCED TICKET SALES

Save time, order your tickets now — send check or money order (allow 3 weeks for check clearance) and self-addressed stamped envelope to:
Ed Alexis, RFD 3, 26 Putnam Rd., Peekskill, N.Y. 10566
One day Ticket — $4.00
Two day Ticket — $6.00
under 12 yrs. — $1.00 each day

STATIC COMPETITION

All models must be operable and RC controlled.

Trophies and/or prizes to be awarded. VCR for "Best in Show." Complete RC systems for 1st place in each category. Trophies for all other winners.

- WWI
- POST WWI (Military)
- POST WWI (Non-Military)
- PATTERN
- GIANT SCALE*
- OLD TIMERS
- SPORT
- GLIDERS
- HELICOPTERS
- SCALE RC BOATS. (Military)
- SCALE RC BOATS. (Non-Military)
- RACING R/C BOATS
- STAND-OFF SCALE
- JUNIOR EVENTS
- RC CARS up to 1/8" scale
- RC CARS over 1/8" scale
- BEST-IN-SHOW**

*Entries may be limited due to space availability
**Best in show will be awarded a VCR

To obtain pre-registration Static Competition forms, write: (include self-addressed stamped envelope) Allen Reinhardt, 2 Douglas Drive, Pleasantville, N.Y. 10570

Judging takes place Sunday afternoon. Entries accepted until 12 Noon Sunday.

Special admission area will be provided on both days for static display contestants with built-up models.

Registration of models will start at 8:30 a.m. each morning.

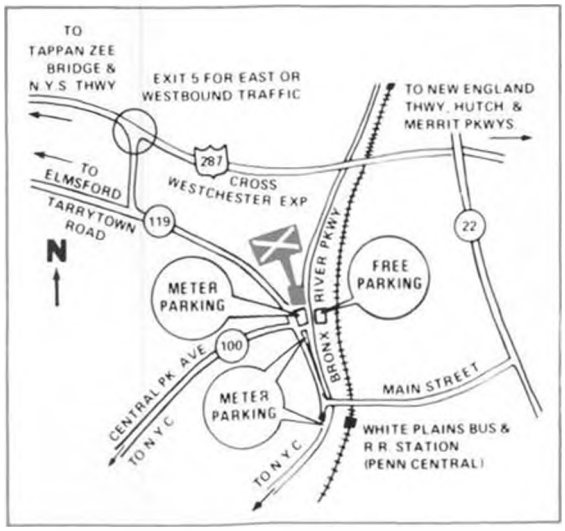
SWAP SHOP

The WRAM's Swap Shop has become one of the major show attractions with thousands of individual items changing hands. To help eliminate "registration crush," the Swap Shop will provide for preregistration forms. To receive these forms send a self-addressed stamped envelope to: John Isbister, 4 Devon Rd., Larchmont, N.Y. 10538.

SPECIAL NOTE

This year there will be no restrictions in the number of built-up models a registrant may place in the Swap Shop.

For further information, write (enclose self-addressed, stamped envelope) or call: Ron Faanes, Route 4, Box 204, Poundridge, N.Y. 10576, 914-763-3986.



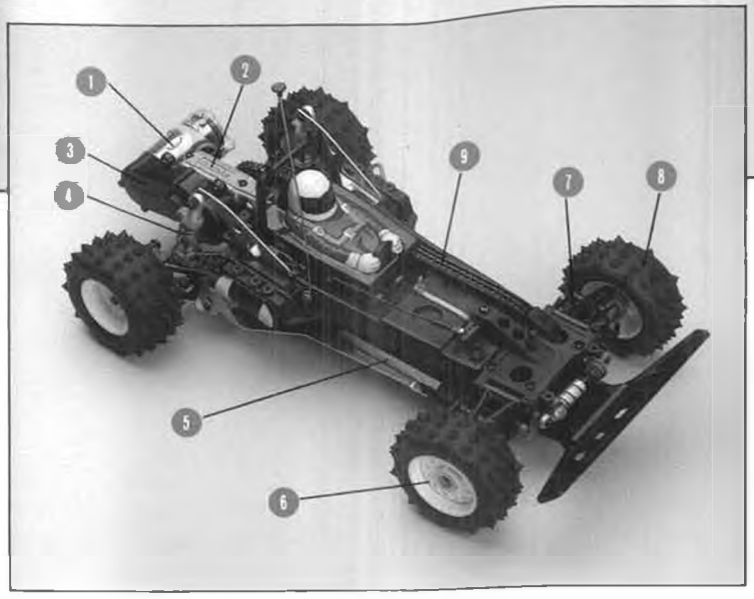
The Westchester County Center is centrally located in the city of White Plains, N.Y., at the intersection of Rt. 119, Central Park Ave., and the Bronx River Parkway. White Plains is just 22 miles north of N.Y.C.

WESTCHESTER RADIO AEROMODELERS, INC.

February 23/24

10 A.M. to 6 P.M.

New ... PROGRESS 4-wdS



1. Powerful Mabuchi RS-540S motor
2. True differential gear system
3. Choice of six drive ratios
4. Oil filled adjustable shocks
5. Advanced torsion bar front suspension
6. Lightweight front wheels with one-way bearings
7. Double wishbone monoshock front suspension
8. New high-grip pattern on front and rear tires
9. Heavy duty chain rides in friction-free guide rail

The Progress Off-Road Racer is a World First!

The Progress not only uses 4-wheel drive for maximum traction, it also has an efficient 4-wheel steering system for lightning-quick maneuverability. Newly developed suspension system assures superior roadholding. And weight has been held to a minimum despite the sophisticated drive and steering system.

See the all new Progress 4-wdS at your hobby retailer today.

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WILD FUN... AT A WILD PRICE

MRC-Tamiya's Pajero Stunt Buggy... Another breakthrough in performance.

MRC-Tamiya has done it again. The Pajero was designed to kick up a storm. . . spin out, pop-a-wheelie, and hot dog its way off-road. Its big RS540 motor provides the extra power boost for all types of stunting. And because we're constantly innovating, and engineering new concepts, we're able to offer the Pajero at a sensational price. . . without compromising quality in any way.

Following hot on the heels of our low cost Grasshopper, the Pajero is one more example of MRC-Tamiya's years-ahead performance at remarkable pricing.

A Pure Pleasure Vehicle. . . Just Look At The Features.

A front independent suspension with coil springs and dual coil springs on the rear axle provide the handling needed to keep the Pajero upright during your fun maneuvers. We've also included a rear differential gear for superior cornering, responsive steering and great traction.

PAJERO

A Genuine MRC-Tamiya Stunt Buggy At A Remarkable Price.

And when you want to do wheelies, just hit full throttle and the Pajero will rear up and do its thing. Or slowly advance the 3-speed forward and reverse speed control and you'll see how smooth this buggy accelerates, even through dirt.

The Pajero is so versatile, it was designed to let you adjust the position of the receiver battery to change the center of gravity. This will allow you to keep all four wheels on the ground, so you can use the Pajero for serious racing, and straight off-road running.

And by designing with a bath-tub style chassis, and a ready-to-go two piece gear box, we've made it easier to assemble than most kits.

Durable and rugged, you're going to enjoy the fun. . . and love the price. MRC-Tamiya's Pajero. . . it's wild. Ask your hobby dealer.

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