a wing incidence indicator • R/C Boats

FLYING MODELS

flying models®

$1.00 JANUARY 1978

Bob Aberle reviews Midwest's RK-40 Ducted Fan

PHOTOGRAPHY: RICHARD URAVITCH

0 71896 47506 01

Martin B-10

DUMAS' NEW OUTBOARDS MAKE A "HULL" OF A DIFFERENCE

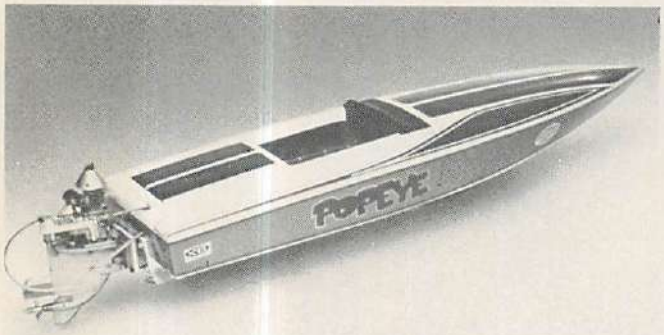
Whether you're running for fun or competition, Dumas' new Hot Shot, the outboard tunnel hull specially designed for the recently introduced 3.5 outboard engine, will blow your mind.

This 24" tunnel kit is easy to build from die-cut birch and mahogany plywood. All you have to do is add your radio and bolt on the engine... and you're ready to run.

You'll also want to look at the 30" Deep Vee 20CF fiberglass outboard kit.

With either of these two boats you can get into one of the newest and fastest growing NAMBA classes.

See your local hobby dealer and take a look at our new Hot Shot and the other Dumas boats or send us 50¢ for our new catalog illustrating the complete line of Dumas boats and hardware.



KIT DV 20CF
A competition Deep Vee.

HOT SHOT (Kit #1311)
Tunnel hull model designed for 3.5 outboard.

dumas boats

Dumas Products, Inc., 902 East 17th Street, Tucson, Arizona 85719

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James A. Boyd, Contributing Editor
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Driving Your Dealer Out of Business

The vacant state of an empty store window where the good old Hobby Shop used to be is an all too often sad reminder of modeling friend who has gone down on the economical rocks. You kind of want to drive past a little faster so you don't exactly have to notice. Maybe part of that uneasy feeling you get is a little private guilt. Sometimes when a good hobby shop goes down the tube it's because we all tried to save a nickel. We go for the discount tags somewhere else. And often as not a good percentage of that goes in shipping cost.

A good shop has to move the merchandise. Trains and planes, ships and engines. The radios, fuel and wood, wheels and accessories. Aileron horns? Tanks? You know he's got them, but how can the dealer stay in black ink on tubes of glue and a fitting or two? When the whole kit box comes by UPS from somewhere else you're just slowly turning your town into one where a great old well stocked shop used to be. It's a tough business, a two way street. If we all support our dealers, our dealers will fill our needs. It's very nice to be able to run down at lunchtime for a set of gaskets and a maple prop instead of waiting for the mailman two weeks from now.

Then there's "Clogging". Clogging is what you do when you meet a couple of friends in the middle of his not-too-big store. What our friendly dealer doesn't exactly need is three middle-aged fatties with only glue money in their wallets holding forth in front of a lonesome cash register. There just might be a more youthful type right behind that doesn't want to interrupt such daring tales to make his purchase. If you must hold an impromptu meeting on the premises, at least pick out the least trampled corner. Things will go all the smoother.

Maybe if you really want to help, invite some of his newer customers out toward the flying field. From the center of town a dealer can go hoarse trying to explain the function of the various pieces of modeling equipment, but one visit to where the flight action is may make a new customer a life-long modeler.

Keep your dealer healthy and modeling won't dry up in your town.

flying models

including FLYING ACES est. 1927

ABC AUDITED PAID CIRCULATION MPA

JANUARY 1978 **VOLUME 81 NUMBER I** **NUMBER 487**

AIRCRAFT FEATURES

R/C MODEL BOATING

DEPARTMENTS

FRONT COVER: Arnie Rattner of New York built this fine Martin B-10 and Rich Uravitch photographed it in front of the old hangers at Mitchell Field on Long Island. This model now rests in the Smithsonian Institution Air and Space Museum. Kodachrome by Richard Uravitch.

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Air Mail

readers' forum

Praise for Sheeks

I want to express special gratitude to Jack Sheeks for his excellent controline AT-6 "Jeep" article in FLYING MODELS August, 1976. It lends support to my belief that sport scale flying successfully combines R&R (realism and relaxation) without all the nail-biting anxieties of competition.

TOM MOORE
San Francisco, Calif.

Corky II

In the July 1977 issue of FLYING MODELS there was an article about the 1977 Toledo Show. In it there was a picture of the Corky II but there was no cost information nor did it say where it was available. Can you help?

ROBERT LOPEZ
Hacienda Heights, Calif.

The Corky II is manufactured by Special Edition Plans, P.O. Box 2555 Schenectady NY 12309 and is an .049 powered seaplane for 2-3 channel radios. The suggested retail cost is $28.98 and if it isn't available at your local hobby dealers, order direct–Ed.

Needs help fast

First, I must congratulate you on an excellent magazine. FLYING MODELS is the best all round modeling magazine in this part of the world.

I have been building a model F86D Sabre for quite some time now and although I have been able to obtain scale details, measurements, etc., I am unable to find any color photos of the plane for authenticity of color scheme. The aircraft is an F86D Sabre with a 67" wing span and I have it entered in Stand Off Scale in the Australian National Championships. If any of your readers could help me out with a United States Air Force color scheme and color photo I would be willing to pay the charges. Thanks for your help.

BRIAN HUTCHINSON
24 Kalkee Road
Horsham VIC 3400
Australia

Timetable

coming events

CLUB SECRETARIES: Items for the FM Timetable are welcome. Submit items typed, double spaced, with necessary information, plus contact for complete data and entry blank. Specify AMA, FAI, etc., rules, classes. Allow at least eight weeks lead time. Items will not be picked up from club bulletins for inclusion. Items must be sent directly to this column. Give name of responsible club official. Column headings include: Radio Control, Controline, Free Flight, Static Scale, etc. Specify.

MODEL AIRPLANE MEETS

FT. LAUDERDALE, FLORIDA—December 4. Broward County R/C Association Quickie 500 races under Sempra rules at Markham Park. Contact: L. Slack, Jr., 19600 West Oakmont Dr., Miami, FL 33015.

LAKE ELSINORE, CALIFORNIA—December 4. The Thermal Thumbers contest for FAI Wakefield, FAI Coupe d'Hiver, FAI A-2 Towline, HL glider and Old Time Wakefield. Contact: J. Quinn, 2012 Gary Lane, Escondido CA 92026.

EAST ST. LOUIS, ILLINOIS—December 11. McDonnel Dougles Indoor meet for Category 1 AMA stick, FAI stick, Paper stick, Cabin, Easy B, Pennyplane, Novice Pennyplane, HL Glider, Flying scale and Peanut scale at the East St. Louis Armoury. Contact: J. Bennett, 324 Helfenstein, St. Louis, MO 63119.

HONOLULU, HAWAII—December 11. IMAC 1st Annual Biplane Championship for Sport Biplane Pattern at Kawainui R/C Airpark. Contact: F. Gomes, 1535 Pensacola St., #111, Honolulu, HI 96822.

WINTER PARK, FLORIDA—December 28-January 1. 10th Annual Tangerine International for all Pattern classes, Formula 1 pylon racing and Sport Scale. Will also include helicopter using the provisional rules by Helo Association at RCACF Field. Contact: L. Lyons, 2923 Bromley Rd., Winter Park, FL 32792.

LAS VEGAS, NEVADA—Fourth Annual Vegas Antique Model plane Society hosts an Old Timer meet at the Eldorado dry lake bed. Contact: R. Haight, 5724 Balzar Ave., Las Vegas, NV 89108.

R/C BOAT CONTESTS

CAPE CORAL, FLORIDA—December 10-11. IMPBA 1/16 and 1/3 mile oval Record Trials hosted by the B&S R/C Model Boat Club. Contact: Dick Schulte, 68 Lagoon Dr., North Ft. Meyers, FL 33903. 813/995-0680.

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HOT FUEL PROOF DOPE

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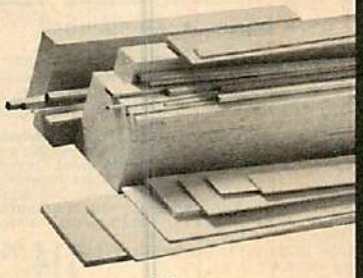

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AMA-SP

Flying Report

news and comment

Sometimes a story should just be told without comment. This one is from the R/C R/C Flyer, newsletter of the Rockland County Radio Control Club in New York written by the editor, Jerry Gleicher.

Persistence is a virtue

We R/C fliers are a hardy bunch, and we're hard to keep down. The challenge of a model aircraft lost in the woods has been faced many times. Some people have resorted to flying full size airplanes over the woods in an attempt to try to spot the lost model. We know of one individual who keeps a compass in his flite box so that he can plot a more direct course to the lost model should the occasion arise. Perhaps the most difficult situation to face, however, is not a lost aircraft, but one that is visible at the very top of a one hundred and fifty foot tree! One can speculate about a lost model, but all one gets when its on top of the tree is visiting rights.

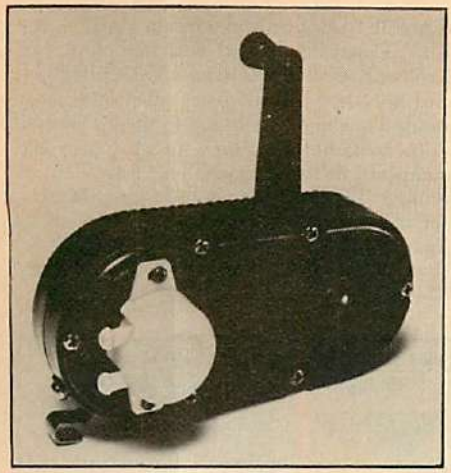
We have a good friend who built a Prather Polecat to fly in a field by his summer cottage. Seems he was entertaining the neighbors with his flying prowess when this one hundred and fifty foot tree came up out of nowhere and plucked his model from the sky. Leaving the country for the weekend our friend vowed vengence, and promised to return to rescue his model. Many plots can be hatched in five days, and so Plan I was born. On his return to his cottage the next weekend, our friend armed himself with slingshot. Now fate decided to tease our friend. The winds during the week had blown his Polecat down to the very last branch capable of holding the model — at a height of some 75 feet. If David could deck Goliath with a slingshot, then our friend could hit his Polecat out of the tree. Wrong! He hit two squirrels, one glass window, and the next door neighbors nasty kid. The return trip to the city was sad that Sunday night. It was during that week that Plan II was conceived. If Willie Tell could hit an apple off his son's head with an arrow, then our friend could hit his Polecat out of the tree. Wrong! He hit himself in the lip. The trajectory of a missle fired straight up ends straight down. The wound is healing well now. Enough was enough. What started as a simple conflict has now escalated into full fledged war. Had not the tree been leaning towards our friend's cottage, that foe would have felt the sting of the cutter's axe. Instead reinforcements were called, in the form of a tree surgeon. Twenty-five dollars later, the hostage was freed and a truce was called.

"All's well that ends well" the saying goes. That may be so for Shakespeare but not for our friend, because there is an epilogue to this story. A model aircraft is built for flying and its place is in the sky, so after cleaning the electronic gear and engine, it was ready to be airborne again. It was a fine hand launch. Then it became a struggle to keep a suddenly tail heavy airplane flying, and then disaster as the water logged balso disintegrated. The wing snapped in half as the glue joints gave up, and our friends Polecat spiralled into the ground. All the pieces fit so neatly in a shopping bag!

Product notes

PECK-POLYMERS, *P.O. Box 2498, La Mesa, CA 92041*, well known for their Peanut scale rubber-powered kits, now have a new R/C model designed especially for the miniature radios. The "Mini Bell" is a 1/3 size version of the famous Carl Goldberg Senior Falcon "Liberty Bell" model which made the record-breaking flight across the United States. The model has a wingspan of 25 inches for two or three channel mini radio, can be powered by either a Cox Pee Wee or the T.D. .020 engine. The model is stable and easy to fly for beginners and for the advanced flyer quite acrobatic, despite its small size. The kit includes such special features as die cut balsa and plywood parts, formed landing-gear and canopy, a booklet on building with photos and clear and easy to understand plans. Kit sells for $14.95. Ask your local dealer for the "Mini Bell". If not available, order direct from Peck-Polymers, P.O. Box 2498, La Mesa, California 92041.

MODEL RECTIFIER CORP., *2500 Woodbridge Ave., Edison, NJ 08817* has recently introduced the MRC-IM fuel pump which

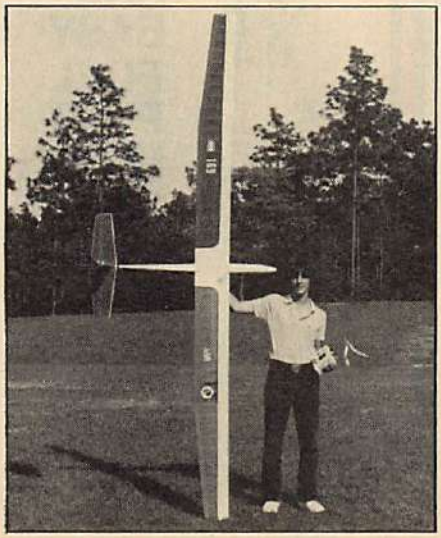


combines an efficient, rugged design with a modest suggested retail price of $8.98. Manufactured with a high impact, fuel resistant casing, it features an adjustable pump head for smooth operation. The knob at the end of the crank handle is free to rotate, providing effortless turning and easy start-up. A convenient clip at the pump's bottom will hold the pump securely to the fuel can. It is available at model aircraft hobby stores and departments.

FIBER GLASS-EVERCOAT CO., *6600 Cornell Rd., Cincinnati, OH 45242* has just introduced a new filler, Microballoons. Made of powder-like, fine-grained glass beads, this filler comes in new salt-shaker containers of 2.4 avd. oz. Microballoons make all resins and glues more sandable; even in

use with epoxy paint primer for fast improved sanding. Available now for $2.25.

HEATH COMPANY, *Benton Harbor, MI 49022* has released the latest Heathkit Catalog that lists nearly 400 electronic products in kit form. Among new products featured in the catalog are: three new high-performance frequency counters, a "budget-priced" stereo FM-AM receiver, new learn-at-home electronics courses in Amateur Radio and Electronic Circuits. An updated selection of informative electronics books including many new titles on computers and microprocessors is also included. The catalog also describes nearly 400 electronic kits including automotive and marine accessories, amateur radio equipment, test instruments, home convenience items, stereo equipment and color TV's. The catalog is available free from Heath Company, Dept. 350-34FM, Benton Harbor, Michigan 49022.



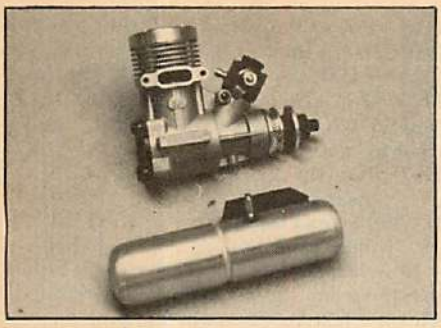
SOUTHERN R/C PRODUCTS, INC., *Rt. 3, Box 47, Nims Lane, Pensacola, Fla. 32503,* has just introduced the Southern Kite. For the Beginner, Sportsman or Competitor—The "Kite" is an easy to build Class C sailplane with excellent wind penetration and a wide manuvering speed envelope. Capable of tight turns without stalling, the Kite is easy to fly and will launch almost hands-off. Construction is of balsa, plywood, and spruce, with all parts machine cut or sanded to shape. Included in the kit are two ¼ inch diameter music wire wing pins and complete full size plans. The Kite features removeable tail surfaces and plenty of room for radio and flight accessory installation. Span: 144" Area: 1200 Sq. in. Length: 52½" Rec. Wt.: 5-6 lbs. Suggested Retail Price: $74.95.

LARRY VANCE, *5066 Cindy Way, Las Vegas, NV 89102,* is offering decal sets for the Old Timer buff. The decals are of the best quality, will lay flat, will not crack and can be nitro proof with proper application. Larry says that the sheets took some investigation because not only did manufacturers use different styles within their own products but there were also color variations. These decals are available for $7.50 p.p. This includes 23 varieties on 6 sheets, 2 sheets of each style.

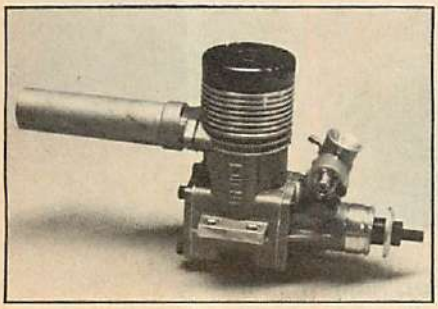
FM Product Reviews:

OPS 3.5 and .60

In the past couple of years there has been a different type of engine that has slowly risen to the top of its field in many classes of model boating, car racing and radio control aircraft as well as control-line speed ships. These are the engines from **OPS** manufactured in Italy. **Shamrock Competition Imports,** PO 26247, New Orleans, LA 70186 has been the primary distributor in the U.S. for quite some time now and has really been doing his job by offering any new engine for sale as fast as humanly possible. Bob Murphy is the proprietor of Shamrock and he definitely knows his business which is, primarily, engines. We just received a sam-



ple of the new OPS 3.5 Speed and the new OPS "Big Red" Rizonanza 60. The 3.5 (.21) is available for marine, auto or aircraft use and can be had with an excellent muffler or a tuned pipe. I tried the aircraft version with a muffler and did some quick tests to get an idea of just how this little monster would stand up to the other 3.5's available today. Using Power Blast 1000 fuel and with the muffler installed the 3.5 turned an 8x6 Power Prop at 14,000, an 8x4 Top Flite plastic at 17,500 and a 9x4 Rev-Up at 16,000 r.p.m.'s. Even though the little motor was screaming, the sound was not unbearable. In fact, Dan Rose thought that it was extremely quiet considering the revs. The muffler knocked a mere 300 r.p.m. off the top end. Our test unit was run right out of the box with only 8 oz. of fuel through it. We found it a bit difficult to hand start when hot but easy if a starter were used. We also found it to have a very wet nose. The main bearing leaked but this may be due to the engine requiring a lot of lubrication while turning up. I can't wait to install this engine in a test aircraft and will report further when I do. Based on what I've seen so far, it should give any other 3.5 a good run for the money.



The "Big Red" .60 is a newer version of the older "Ursus" 60 but features different porting and timing to allow the use of a tuned pipe, either side or rear mounted. The newer version features a rear mounted pipe and a bit different head design. Depending on the prop used the "Big Red" turned anywheres from 250-1,000 rpm's more than the Ursus. The pipe is only advantageous at higher revs with smaller props. In other words, one wouldn't put the pipe on the engine with a 14x6 prop. But what a difference with an 11x7! By playing with the length of the pipe different props will turn up at different revs. To give you an example of what I'm talking about here are some figures for the side-piped engine with a Semco Flow-Thru muffler installed:

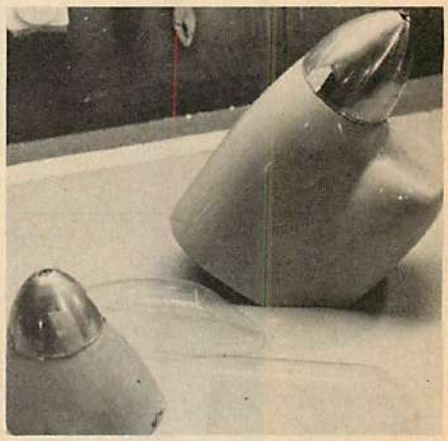
10x6	Rev-UP	15,500 r.p.m.
11x6	Power Prop	14,500 r.p.m.
11x7	Rev-Up	13,250 r.p.m.
11x7½	Power Prop	12,250 r.p.m.

11x8	Power Prop	12,000 r.p.m.
12x6	Top Flite	12,000 r.p.m.
13x5	AHM	11,000 r.p.m.
14x6	Top Flite	10,250 r.p.m.

Now, all we did was add the pipe and here's what we got:

11x7	Rev-Up	14,250
	Rear pipe	15,000
11x7½	Power Prop	13,750
	Rear pipe	14,500

Now if that's not impressive don't forget that these are figures taken on the ground. This not take into account what the engine would turn after its unloaded in the air. If my Buzz-Bee audio tach is as reliable as I think it is, the rear piped engine turning an 11x7W Zinger is turning in excess of 16,000! I also think it's interesting to note just how fast it will turn a 12x6 with a Semco muffler installed. Also notice that it spins a 14x6 at 10,250 which is about 1,000 revs more than any other 60 I've seen to date. Once again Power Blast 1000 was used for all testing. With the side-piped engine running Missle Mist and swinging an 11x7 Zinger we got a reading of 16,500 from the audio tach while coming out of a split S. Impressive to say the least. By the time you read this, many pattern fliers will have switched over from the Rossi to the OPS for a number of reasons. Speed could be one reason and I'm sure that its ability to stay together is another. And I thought that the Italians only made fast sports cars—FRANK TIANO.



Bob Holman Plans

Pictured here are a fiberglass cowl, aluminum spinner and clear plastic canopy for a Hawker Tempest and a Hawker Hurricane. These items and thousands more like them may be found at **Bob Holman Plans**, P.O. Box 741, San Bernardino, California 92402. Along with the cowl, spinner and canopy comes a beautiful set of plans for almost any type of scale ship you'd like to model. In many cases the components are offered with the plans at a discount but if the plans are desired separately Bob can supply them. Since I am contemplating building either the Hurricane or Tempest for next year's contest circuit I decided that scratch building from my own drawings just wasn't for me. I spotted an ad for Bob's plans and accessories and immediately contacted him for information on both subjects. For $26.95 I received a perfectly formed fiberglass cowl, a scale 4" aluminum spinner and adaptor, a crystal clear canopy and a very well-done set of blue line drawings showing construction details and all parts necessary to

Out Of The Skies Of History

Chance Vought F4U-1A

CORSAIR

Kit FS-36
Wing Span 36″

$29.95

36″ Stand-Off Scale R/C Model

About The Airplane:

The prototype XF4U-1 was first flown on March 29, 1940. The Corsair was to become the most important Naval Attack Fighter of W.W. II, and remain in production for 13 years, yet its first service trials had ended in failure in its chosen role. It did not reach maturity as a great fighting machine easily. It gave notice that it was to be flown and tested at all times like a true racing stallion, and was an airplane for inexperienced pilots to reckon with. Because it was an advanced design—and had a new and untried high horsepower engine the Corsair required many perplexing and difficult flight tests and service changes before assuming the role of the Navy's first line fighter.

The Chance Vought Corsair had a service life spanning two wars, performing every conceivable mission possible for a military flying machine. The Corsair had a 15 year life span of battle victories unequaled in the annals of aviation history. Vought ceased production of the F4U-1 Model on Feb. 2, 1945 with the delivery of the 4,996th airplane. In air-to-air combat the Corsair had destroyed 2,140 enemy aircraft with the loss of 189.

The Corsair's distinctive whistling war cry, caused by the wing-root inlets for engine air, earned it the nickname "whistling death" among the Japanese.

The Corsair's most unique feature was the bent (gull) wing which was necessitated by the most powerful engine ever installed in a piston-engined fighter, coupled with one of the largest props in the world. Thus the inverted gull-wing permitted the short, sturdy landing gear required for carrier operations.

The first combat unit to receive the Corsair was VMF-124 and the first 12 machines arrived at Henderson Field on Guadalcanal on Feb. 12, 1943. On Feb. 13, VMF-124 demonstrated their superiority over the Wildcat by escorting PB4Y-1 Liberators all the way to Bougainville. The following day they saw combat for the first time, and the inexperienced Corsair pilots were badly mauled by some 50 Zeros. Two Corsairs, two Liberators, two P-40s and four P-38s were lost in this "Saint Valentine's Day Massacre", but the Corsairs soon gained superiority over the Japanese which was never lost. VMF-124 was subsequently credited with 68 kills against a loss of four aircraft and three pilots. Within six months, all Pacific-based Marine Fighter Squadrons had been re-equipped with the Corsair and the list of aces and the airplanes legend began to grow.

About The Kit:

Designed expressly for 2 channel R/C with plenty of room for just about any R/C up to 4 channel miniature units. Maintaining top quality and simple construction, (even the inverted gull wing), all Balsa and Plywood parts are accurately die-cut, Hardware Package including R/C Hardware, full-size step-by-step Plans and a flat finish Decal sheet for Major Gregory "Pappy" Boyington's Lulubelle as it appeared after the Oct. 17, 1943 raid on Kahili Airfield, Solomons. Recommended engine sizes for maximum performance .09 or .10. Minimal performance achieved with stock .049 or .051 Tee Dee. Diesel conversion of Tee Dee Engines is suggested.

Sterling MODELS INC.

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If no dealer available, direct orders accepted — with 10% additional charge for handling and shipping. (50¢ minimum in U.S., $1.25 minimum outside U.S.)

- ☐ Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, boat model kits, accessories, etc. 50¢ enclosed.
- ☐ "Secrets of Model Airplane Building". Including design, construction covering, finishing, flying, adjusting, control systems, etc. 25¢ enclosed.
- ☐ "Secrets of Control Line and Carrier Flying". Including preflight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions 25¢ enclosed.

No checks. Only U.S. money orders or currency accepted.

Name _____

Address _____ City _____ State _____ Zip _____

build a Tempest. All plans offered are from famous designers. In the case of the Tempest, it is from a Brian Taylor design. Brian Taylor, who resides in England, is a world famous designer and builder of scale models. The very complete drawings show both wing halves and in many cases a separate sheet with just parts may be used for templates. Since receiving the plan-pac, a few other fellows in the area have sent for pacs on different ships. I've seen the plans and accessories for the ME-110 twin engined fighter and though somewhat difficult to build, there is no guesswork left for the builder. Also available from Holman are Elite plans and Complete-A-Pac kits of various subjects. By the way, there are many designs available for rubber power, gas free flight or control line as well as radio control.

To give you an idea of just what's available you should send $2.00 to Bob for his multi-paged catalog. But just to whet your appetite, here are a few examples of his offerings.

Brian Taylors Hellcat, plans, prop nut, canopy, and cowl . . . for $23.00. Along the same format are a Corsair F4U-1, T-6 Texan, ME-110, P-47 Thunderbolt, P-51 Mustang, Spitfire MK1 and a FW-190A-4. All the preceding retail for a maximum of $24.00. For a maximum of $16.00 you may take your choice of the following plan-pacs; British Turbulent, DH Chipmunk, Miles Magister, Feissler Storch, Hawker Fury, ME-163 Komet, Jungmeister and a DH Mosquito. If anyone is looking for a Fairey Firefly, Bob's got the plans for that one too. For the twin engined fanatic there is a Westland Whirland with a 65" span for 2 engines of .30 displacement. Or, how about a 63" Mosquito for two .30 - .40 engines. In his kit line is a beautiful Douglas Skyraider for $105.00 complete. Or how about a Fairey Swordfish for $85.00? Too much money? Okay, the plans are available separately for $7.95.

For anyone in need of scale drawings for documentation or for scratch building, Bob offers some very nice three views from Aero Modeler. These drawings are usually comprised of two sheets and show cross sections and airfoils as well as detailed cockpit photographs. Many show other details such as landing gear legs, propeller drawings, stencil applications etc. Most of Bob's information comes from England, the country where it all started in WWII. The English are very much more into scale than the modelers in this country hence the vast quantity of scale information and merchandise available. All we needed in this country was someone to bring all these goodies over to us at a reasonable price. His name is Bob Holman. Send for his catalog and see what he's got to offer. If you're really into scale, I betcha you buy something from him—FRANK TIANO.

Hot Stuff

There have been numerous articles written about cyanoacrylate adhesives, commonly called ca's. As with any product that receives nationwide acceptance, any competitive product with the same selling points sometimes is called by the same name. For instance when we reach for or ask for a tissue we probably say "Pass me a Kleenex" even though the product may be made by Scott tissues. In the case of ca glues, almost everyone calls all of them **Hot Stuff** simply because they were *the pioneer in* ca adhesives as applied to the hobby industry. Since the introduction of Hot Stuff I have had the opportunity to test and try various other ca adhesives, some very good and some so-so. Some had different applicators, others featured different packaging but they all did the job more or less. Well, it was the Less part that I became curious about and after careful evaluation I have decided that Hot Stuff as distributed by Bill and Bob Hunter of **Satellite City**, 9486 Sandusky Ave., Box 1935 Arleta, California 91331, was the one I'd stick with. (any pun is purely intentional) With the introduction of the large economy sizes and the new Blue Line Hot Stuff it's become my favorite.

After looking at other brands it occurred to me that Hot Stuff was *the only ca glue where* you can plainly see the amount of product you're getting for your money. The bottles are clear, not white or clouded. Also, if the product has been laying on the hobby dealers shelf for a long period of time and has become somewhat gelled, we can see the condition and purchase a different bottle. With some of the other brands we must wait until we get home to find out that we have been thoroughly stuck. It's not the manufacturers or dealers fault if the glue has gelled. The ca's have a somewhat limited shelf life and should be stored in a freezer to prolong that life indefinitely. I know some hobby shops that do store their ca's in a freezer but I'm certain that there are many more that do not.

Another reason for preferring Hot Stuff after trying so many brands is that this product seems to glue more dissimilar things together than most. For instance, I have joined electronic components, wire, balsa,

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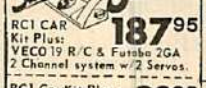

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plywood, glass, metal, rubber, hardwood, plastics, gaskets, teeth and fingers with this miracle glue. With careful and proper use it could become one of the most valuable construction tools in the modelers workshop. It only takes a drop or two of Hot Stuff to properly join two mating surfaces. Drowning the pieces is not advised nor recommended since the resulting joint actually becomes weaker. Also, ca glues are not void fillers, that is, they cannot bridge a gap like epoxies do but require a tight fit to be effective. Ca's have an operating temperature limit of 180 degrees F. and as I said before, they may be stored indefinitely in the freezer. Just be sure to let the solution return to room temperature before using. Be sure to wear some sort of eye protection when using Hot Stuff or any other cyanoacrylate adhesive. All surfaces to be joined should be clean and free from grease or dirt which will hinder the performance of Hot Stuff. The teflon applicator tube, which so often becomes clogged, will not to do so easily if the bottle is squeezed gently before setting it back on the bench. The little burst of air that you force through the applicator by squeezing the bottle will stop any parts of the adhesive from sticking to the top of the bottle. In case of a permanent clog, Satellite City offers extra applicator tubes for a very nominal price.

I've recently tried the new Blue Line form of Hot Stuff and find that it has its uses where regular Hot Stuff might be difficult to use. For instance, it's easy to drop a few drops down into a fuselage and see exactly where the glue is going when using Blue Line. With the regular formula it's sort of a hit and miss application when mending a broken bulkhead way down inside the aircraft. For regular construction I prefer the clear formula but for field repairs or hard-to-get places I use the colored type exclusively.

Price wise, Hot Stuff is very competitive with most other ca glues when one considers the amount of product for the price. Many other companies have tried to confuse the modeling public with the use of *grams* whereas Hot Stuff also displays the amount in ounces on the label. I think that this is very important especially since ca glues are a rather expensive purchase even though a small container goes a long way. Another reason for my becoming a Hot Stuff user is that they are the only product offered in large sizes for the person that does a lot of building. I know a few men that build professionally and they use the large bottle exclusively. Prices for a two-bottle, ½oz, regular size package is $3.50 while the large 4 oz., two bottle size is $24.00. That's a savings of $4.00 figured at retail. A ½oz package of Blue Line retails for $4.95. A package of teflon applicator tubing measuring 18" is available for 50¢.

I could go on and on about the reasons why this product has finally succeeded in turning me on so much but it probably sounds like a commercial by now. If it does, please accept my apologies, but a better cyanoacrylate just isn't available when one considers application methods, packaging and price. Satellite City distributes Hot Stuff exclusively, they sell nothing else so they must make sure that their product is top shelf. Try some and see if you don't agree. Best of all, the next time one of your buddies tells you to "stick-it", you'll know what to use—FRANK TIANO.

FM Clinic

tips from the staff

Spoilers

J.A.: How does a full scale glider use spoilers in a landing? Are they useful to an R/C soarer?

ANSWER: A full scale glider uses spoilers to increase the sink rate. These aircraft glide forever on a landing approach and without spoilers it would be very easy to misjudge altitude and float right over the available runway and end up nesting in the trees beyond. Full spoilers are opened to increase the rate of sink without changing the airspeed. If the spoilers are opened halfway, the sink rate is increased to a lesser extent. Now a simple hand motion of the pilot can apply more or less in the way of spoilers, which acts for all intents and purposes as an engine throttle, even though you have no engine. Lesser amounts of the spoiler will help you extend your glide path, more will act as if you have pulled the throttle back. With a little skill and practice a pilot can put a glider on the spot almost every time. As for their value on an R/C soarer? Certainly, though only found on the larger, more exotic aircraft. They will add to your soaring, dethermalizing capability.

Applying Decals

G.P.: I have trouble ruining decals in the process of applying them. Can you offer any help?

ANSWER: First lay the decals out, where they are to go. Align along a spar, or tape mark the spots. Moisten only one at a time, holding flat in a shallow saucer of room temperature water. Blot off excess moisture, before and after applying. Move as little as possible, allow to dry.

Tin Can Gear Straps

K.A.: How can I attach landing gear wire to a plywood bulkhead? I have tried J-belts, but those I've found do not fit 5/32" dia. music wire.

ANSWER: If you cannot find a packaged set of straps or belts for the occasion, try a tin can after dinner. Tin snips will carve a can up into any width strap desired and it is then a simple matter to file the edges smooth, fold it around the gear and squash it tight around the wire in your vise. Next, a centerpunch will mark where to drill and a bolt through the firewall will hold it well. Use washers and whatever width you need for a rugged mounting. Two thicknesses might be used on larger, heavier aircraft.

Plumbing Problems

H.A.: Can you offer any suggestions on routing fuel lines?

ANSWER: Firewalls and fuel lines don't seem to get along well together. Drill a hole where you think you'll need it and it should have been over that way another ¼" and now you've got a kink. Try to plan things out as much as possible ahead of time with the engine in place. Not only should fuel lines

travel in smooth arcs between connections, but they should not come into close contact with the hot cylinder fins. Rubbing the engine can also cause the line to kink and it may of course weaken itself accordingly, or in some cases develop a leak.

Biplane Rigging

J.A.: I am interested in building an original biplane R/C design, but I hesitate when I think of the problem of aligning the wings in relation to one another. A lot of wire bending and how do you keep the critical angles accurate?

ANSWER: It might take a little more time and thought, but it is not all that difficult. Your lower wing can be positioned in relation to the fuselage and tail group in the standard manner. Mounting the top wing up in the air does seem at first to present problems, but not if you build a simple jigging device to hold it. You might try a balsa jig to align the top wing's airfoil with some visible reference point on the fuselage, or better yet, two larger jigs to fit both the lower wings's airfoil camber and that of the upper wing. When two jigs are used in this manner they can be placed outboard toward the wingtips and steady the upper wing's position as seen from the front view as well. The fuselage and lower wing should have attachment points for the intended struts, designed as much as possible for the struts to be attached after covering, that is to slip into place (in tubes or whatever) after the covering is applied and doped. It is very difficult to cover a completely assembled biplane with a full set of wing struts in your way, the covering cannot be stretched and fitted into position in such a situation. If you can devise wire loops or something of that nature epoxied into the wing structure, they can be made to protrude just a fraction through the covering (with the slit of a razor). You may wish to build a cradle at the wing's center and lash wing on with rubber, or it may be permanently attached if transportation is not a problem.

Grain Direction

G.L.: Why should the wood grain on a spar web run in a vertical direction? I can't see where this would help anything.

ANSWER: Some aircraft use a thin web of sheet balsa with grain running vertically between ribs to keep the spar (which carries the full strength) from buckling. It could still buckle inwardly from loads imposed if the grain of these webs ran spanwise.

While we are on the subject, let's cover a few other points with regard to wood grain direction. Little triangular wing trailing edge type gussets should have the grain running parallel to the longest side of the triangle, that is at a 45 degree angle in relation to the rib and trailing edge. Grain is often run across the width of a fuselage when crush strength is desired (as when squeezing the fuselage when holding it). Formers within a fuselage should have some wood grain running sideways for this same reason. Strips of balsa with grain running lengthwise can be inlaid into large expanses of sheetwood in a stabilizer or fin to reduce warping, or along the tips to accomplish the same end.

Stack-Sawing Ribs

F.P.: Can you please outline a practical method for sawing out ribs on a motor saw?

ANSWER: Determine how many ribs of a given size are required, then select enough suitable sheet balsa. I like to trace the rib outline desired on tracing vellum perhaps six or eight times. I then coat the back of the tracing paper with rubber cement. The sheet balsa is now sliced up into suitable lengths and up to about eight sheets are next tack-cemented together with a thin strip of cement about every inch or so. A coat of rubber cement to the top blank and you are ready to adhere the paper rib drawing to the balsa. The rubber cement will rub off completely later on. Once these stacks of blanks have dried sufficiently, they can be run through the motor saw very easily. Do pass the wood from the same direction each time however, that is from the leading edge first along the top camber, then again from the leading edge along the bottom camber. This is important in case the saw blade is not 100% vertical in relation to the table surface. Even a 1 degree error in blade alignment would double itself otherwise, while if cut as suggested the 1 degree error would cancel itself out. After the top and bottom cambers have been cut the notches are a simple matter with the saw blade. Do check them for size against the actual wood stock rather than a theoretical measurement to achieve a good snug slide-in fit. Once all is cut, peel off the paper pattern, rub off any rubber cement with your fingertip and slice the ribs apart with the aid of a razor blade. You will find ribs so made to be very accurate, if your initial patterns are identical. It is also possible to use wooden ribs already cut as a pattern for the saw to follow.

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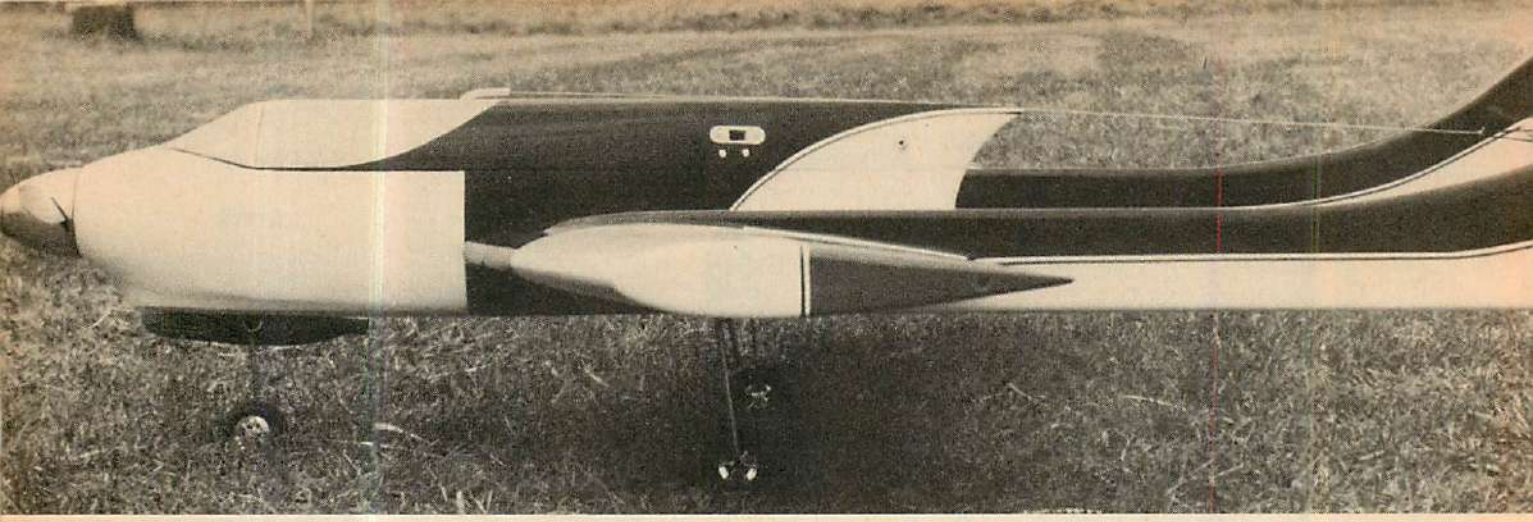
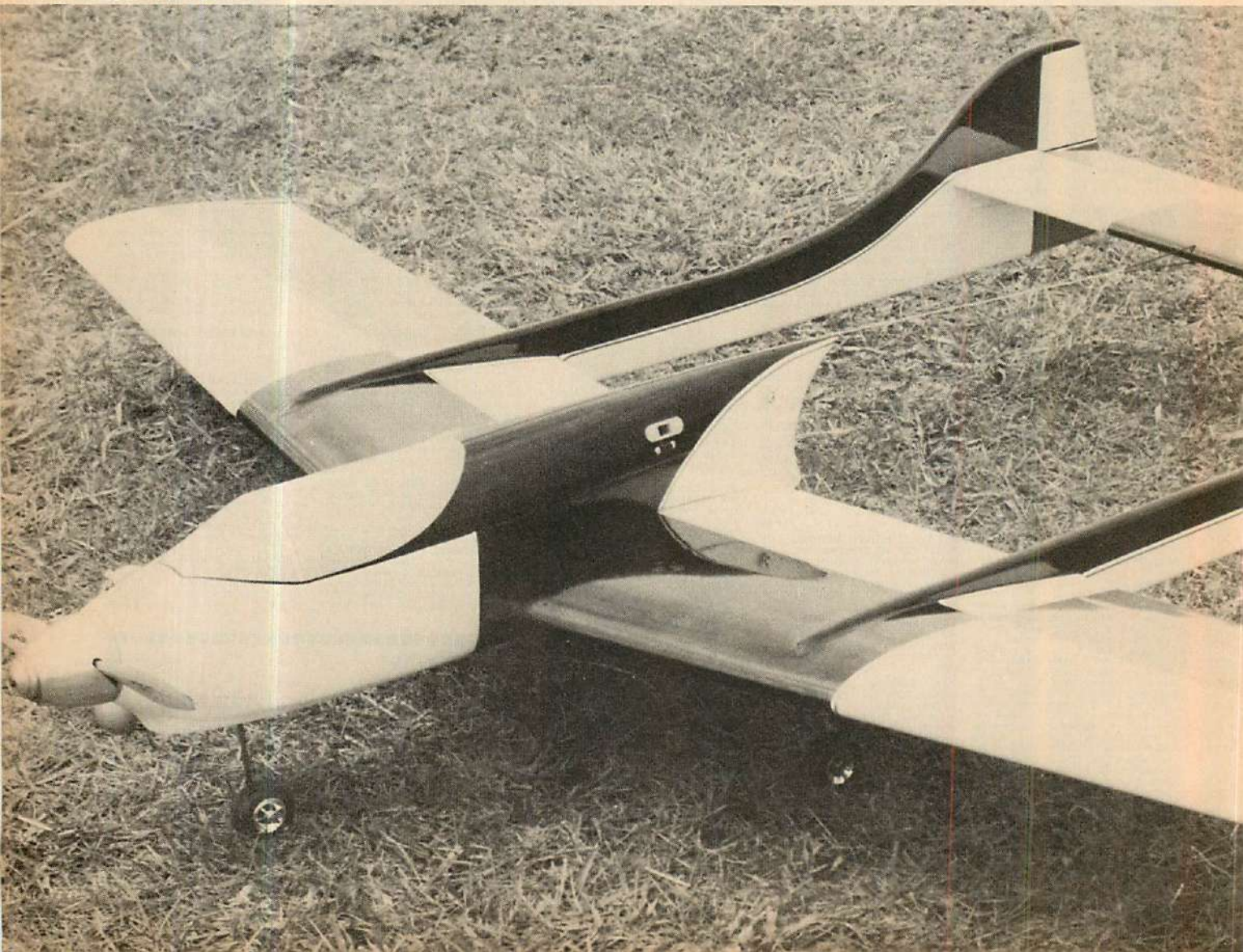
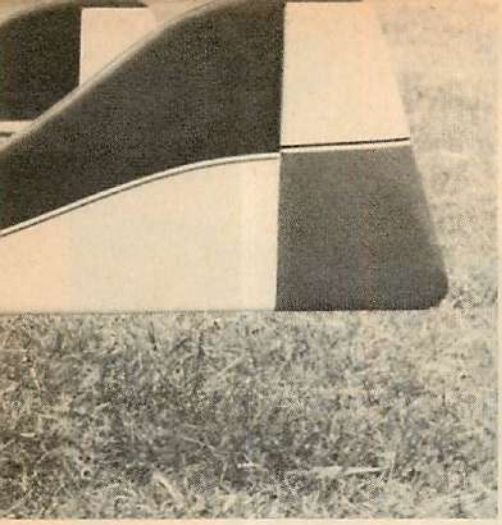
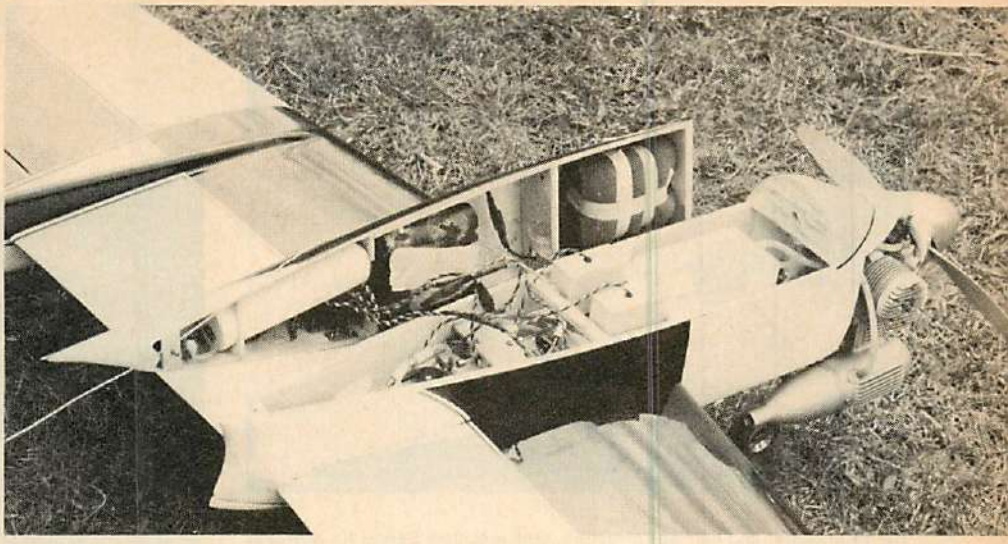


Twin-Boomed CHALLENGER

PHOTOGRAPHY: BOB GODFREY

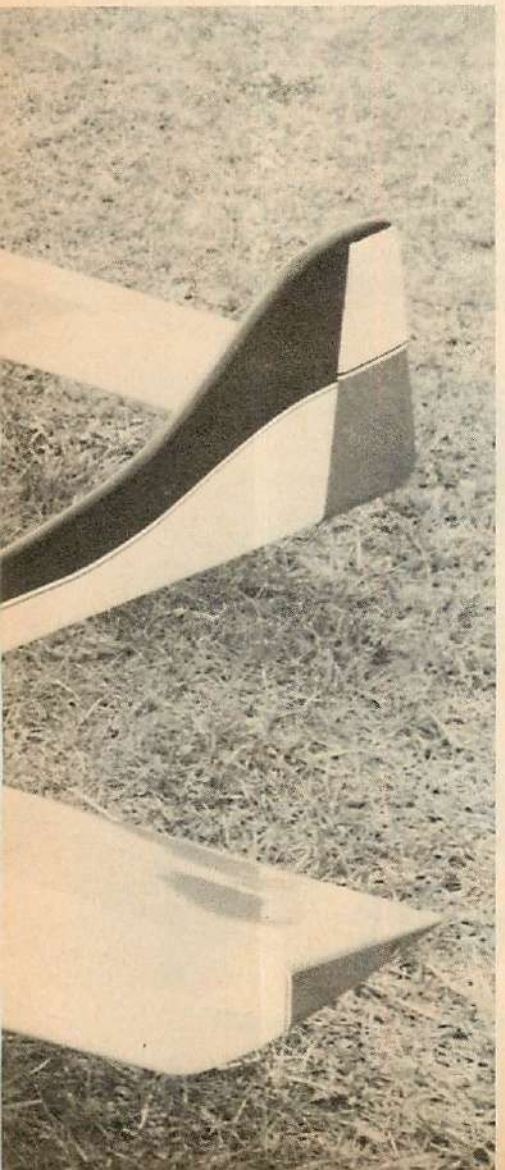






Where is it written that all pattern aircraft have to look alike? This one's Exotic yet simple to build. A performer/**Bob Godfrey**

Not much fuselage, but it all fits in one way or another. Top hatch pulled here for your eyeballs. Note air tank, battery pack in hollowed top block. Antenna passes aft between booms. **At right and below:** Twin booms for a distinctive look. Super simple to build, install. Elevator, rudder Nyrods pass through boom.



Forward by Jack Sheeks

The model you see here came into existance due to the persistance of one Robert Godfrey. A good friend, and a pattern flyer with the desire to fly something a touch different. Some years back, when Bob was just learing the foibles of the pattern he accompanied my for the maiden flight of a twin boom Controline design called the Sea Vixon. Some FM readers may remember it. The ship seemed to impress Bob very much and when he became a competent competitor in the event the memory lingered on. From time to time he expressed a desire to build such an aircraft for R/C pattern meets. Not being a draftsman, "what Bob would like to have" really translates into a subtle hint for old Jack here to draw up a set of plans for him. Being on the busy side, I kind of hoped he would forget it or go sleep it off, but no, not Bob, he's a very persistant type. As time was slipping by I finally decided I had better get at sketching up a set of plans to his liking before a friend was lost. What Bob had in his mind's dream was a foam swept-wing design utilizing the Verdige airfoil. You might like to know we talked Arnold Stott of Foam Flite into making the wings, so you can order them from Foam Flite if you are not adept, or set up for foam core cutting.

A few lines were on paper for the wing's configuration, but Bob was already pressing ideas into my mind. He wanted the central body to be removable for various reasons. I decided the top of the fuselage should be an access area as well, so the radio system could be worked on without removing the fuselage and disturbing all the servo settings. Anyway, the drawing progressed with Bob leaning over me driving me on. Two heads are better than one as the saying goes. Mostly however Bob was there to put an end to my stalling tactics.

With enough of the pencil plans in his big hot hands he was off and running. I didn't hear from him for about two whole weeks, at which time he then announced the ship was almost ready to paint. He brought the aircraft by the house so we could get a couple of shots of the ship's framework before it was all put together, but one roll of film didn't come out at all. I think we were a little too involved with appreciating Charlie's Angels and not quite up on the darkroom chemistry. At times I guess our minds wander a bit.

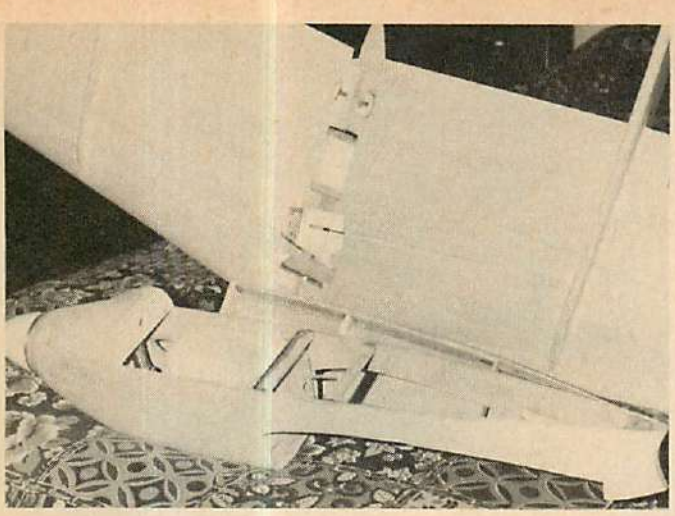
Once the epoxy paint was put on, Bob was really hot to trot, time to test fly the new bird. He claims he got no answer from my old phone and thus preceded to the field with only his lovely wife Pat to witness the maiden voyage. How could he forget me like that? I love a good wreck. I'm not sure, but I think he did this in case the twin-boomer turned out to be a dud, but no matter, it truly flew great! We'll let Bob take over the text here and explain this part as he is a far better R/C pilot than I. (This is the only way to get Bob Godfrey to write an article - get it started for him, then he has to take over in the middle to defend himself - The Editor.)

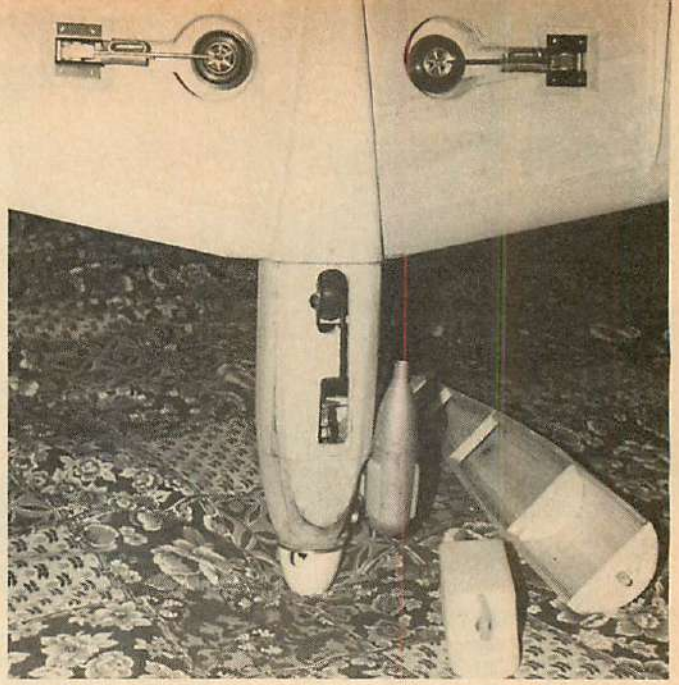
Bob continues: When I first saw Jack's twin boomed Sea Vixon I couldn't believe my eyes. The old fuselage hung out in front like a sore thumb with two other sleek booms extending along behind it. The configuration flew beautifully and it made Jack look like a pro. As he said, it remained stuck in my mind and I finally conned him into drawing me one and this is how it ended up. The aircraft as an R/C, grooves, it is stable and penetrates into the wind like a knife. I think if you try it in the air you'll agree with me and I plan to fly it competitively as often as a contest comes along.

As for the name, the thought of building three bodies seemed to hit most modelers as something of a challenge, but they are in reality structurally easy and quick to build. If they weren't, we wouldn't have become all that involved, so don't give up, you may be the only flyer at the next meet that isn't flying the same old recipe. And that may perk the judges up just enough to remember your flight, even if you are not one of the hallowed set. If you're interested in a practical machine with a touch of difference, then read on, it won't hurt a bit.

The Construction

Begin by obtaining, cutting or modifying the wing. This means that you have a choice, order a wing from Foam Flite, 628 West 6th,





The wing center and fuselage structure, tank installed. Serves for ailerons, elevator, rudder mount in wing center. **At right:** The Rhem-Air retracts clean up the aircraft, easily installed in a conventional manner. **Photo below:** Bob contemplates the next flight to come. It makes a good competitive design.

Mankato, Minnesota, cut your own from the patterns on the plans, or possibly modify a Verdigo II wing. Anyway you slice it, a wing is needed!

The barn-door sized ailerons were cut first, operated from torque rods made from brass tubing. Next, cut out and line the retract wheel area with 1/32" plywood, with 1/4" stock for the mounts. The servo area is designed for three servos. Slots for the rudder and aileron linkages were cut after the wing was covered with 1/16" balsa and the booms were installed as we were not quite sure where the final placing would be. We do know for certain now, so follow the plan's notations for these functions.

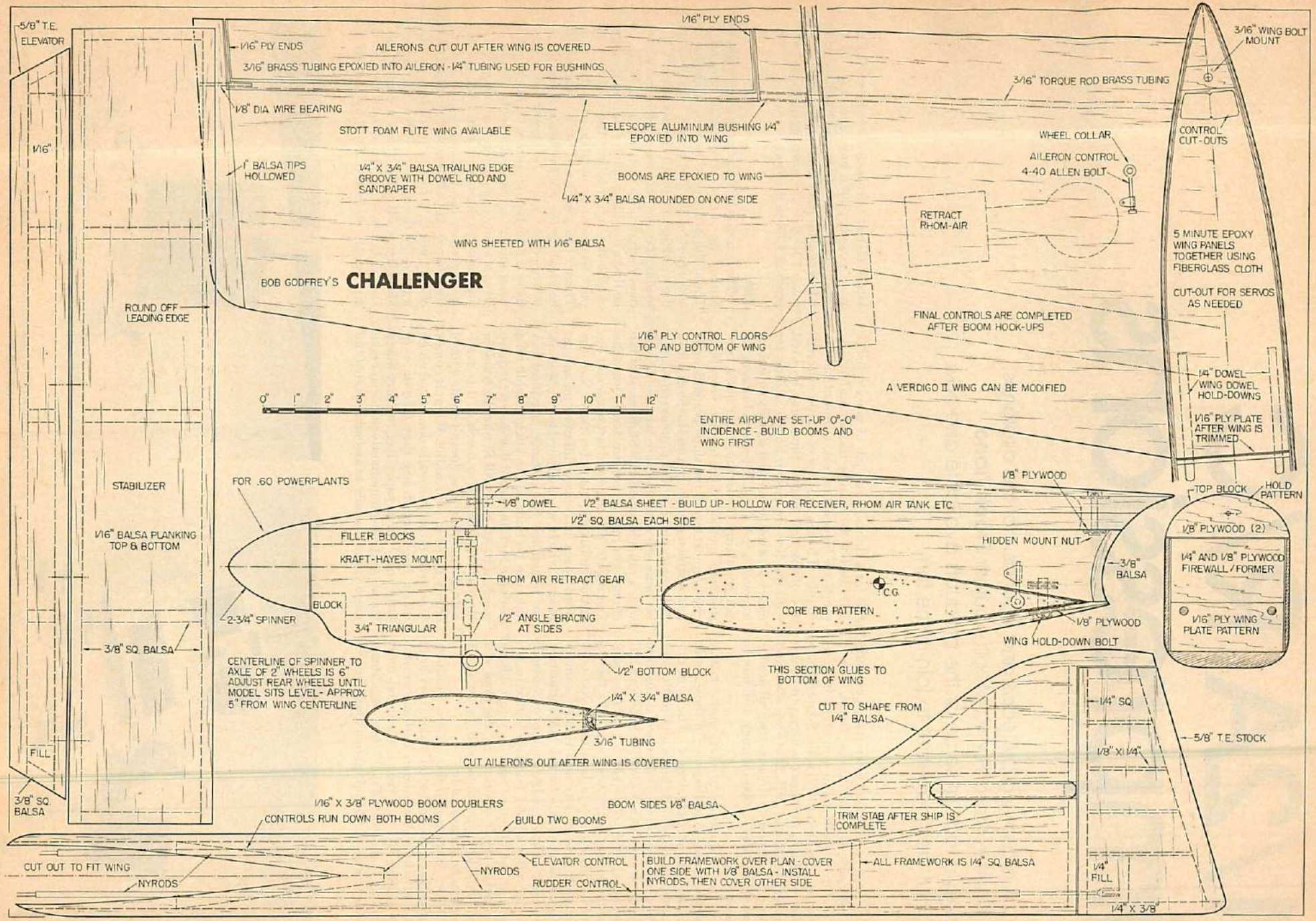
The booms themselves are built up from 1/4" square balsa and sheeted with 1/16" balsa sheet after the Nyrods are installed. Rudders are assembled right along with the booms. The stabilizer and elevators are built in just about the same way. Does that sound easy? Now rig the extra foam the wing came packaged in so that you can use it as a set-up for the boom fitting.

Slide the booms into place and mark them carefully. Now move them back and make your initial control hook-up, after which you may slip the stabilizer into place, aligning all the little goodies. When satisfied you may epoxy them into position, blocking the booms up at the rear for some support. Now that wasn't hard, was it?

While all this stuff is setting up, build the center fuselage as you would any other. The only difference is that it is shorter. You may install the retracts after the fuselage is complete. Note the fuselage is strengthened somewhat by reinforcing it with 1/16" plywood. This body is very roomy and it offers you plenty of space for all that exotic hardware you want to pack into it. We could go into a glue A to B routine, but if you still need such instructions you are picking on a bird a little too advanced for your present skills.

The engine, the retract servo, battery and receiver were installed in the removable fuselage top canopy (hollowed top block) or whatever you wish to call it. Rhom Air retracts were used, with a Kraft 13 oz. tank to juice the O.S. 60 engine. Hobbypoxy was used for the finish and the radio selected to guide this 8½ lb. machine was a Pro Line. The ship came out just a little nose heavy and about two ounces of lead was added to the tail section.

The Challenger adds up to a rather impressive looking aircraft and it's unusual planform detracts not from the competitive capability. We believe you'll enjoy the experience, so hopefully we'll see you on the field.



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1/2A R/C impressions

1/2A is growing by leaps and bounds, not the airplanes, interest in them. FLYING MODELS author **Frank Tiano** takes a look at some of the products available and how to put them together to join in the fun.

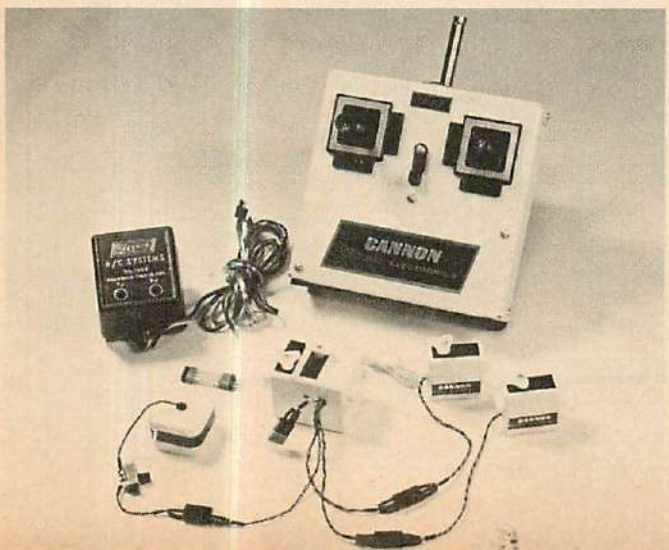
It's no secret that ½A aircraft are currently sweeping the country by storm. These tiny ships are offered in every type imaginable, from trainers to full scale. Some feature balsa fuselages and foam wings, others are entirely balsa and still others are stick and tissue balsa models. In any case, all are intended for .049 - .060 engines, commonly called ½A.

By now, almost every R/C enthusiast is contemplating building one of these little devils or has already done so. The most difficult thing is knowing just which model and accessories to choose. When we are used to spending anywhere from $50 - $150 for a full sized ship, the $15 - $30 for a ½A model should seem cheap. Anyway, that's the intent of this article; to familiarize you with the multitude of kits and related components now available for the ½A enthusiast. I've done a considerable amount of research on the subject but I must apologize in advance to the different manufacturers whose products I don't mention. By the time you read this I'm sure there will be twice as much material available.

Before getting into the various products currently on the market let's take a very brief look at why ½A airplanes and accessories are selling like hot cakes. First and most obvious is the cost of each item. Kits retail for as low as $9.95 and up to a maximum of $30 for a deluxe scale job. A good reliable T.D. .049 or .051 can be had for under $18., props are 50 cents or less, a pint of fuel - a couple of bucks, etc. For covering material, any of the new plastic films may be used with the less expensive brands selling for under $4. a roll. One roll is usually sufficient to cover a ½A ship. The second reason for ½A popularity is that they offer quick construction methods and require very little glue. Almost any of the ships available may be constructed entirely with Hot Stuff with a little epoxy and Fast Tak in areas requiring a bit more strength. Because we are blessed with a miracle called Hot Stuff, most of the aircraft kits may be constructed in less than four nights. The third and last reason for the ½A craze has just got to be *space*. Now the word space has many different meanings, most of which, when applied to ½A Models, are beneficial. For instance, a typical ½A ship can be built on the kitchen table on a portable building board that doesn't require much of it. All ½As will fit into the trunk of any car regardless how much of it is available. To purchase one doesn't create a lot of empty *space* in your wallet. When it comes time to fly them, you really don't need much *space*. If you crash one they take up very little *space* in a paper bag to carry them home. And most importantly, it doesn't take much *space* upstairs to assemble one of the kits. Well enough about the reasons why ½A is so popular, let's look into some of the products available to us which will probably take a considerable amount of space! In each case, I'll give my own opinion on what product I liked the best.

Kits

The various kits on the market could be broken up into four general categories: Trainer/Sport, Sport/Pattern, Sport/Racer, and Sport/Scale. The reason why I've put the word Sport with all classifications is that in almost every case the models will serve a duel purpose. For instance, a scale ship can be flown just like a pattern ship and a trainer can be flown just for the fun of it once the pilot has become familiar with it. For the Trainer category I will list kits that should be ideal for the novice flier and fun for the intermediate pilot. In almost every case, these trainer types feature a high or shoulder wing mounting and very stable airfoils. In all cases only two channels are required for maximum performance. From Ace R/C you can purchase the Whizard, a high wing design for regular .049 engines. Airtronics/Cox offers their Q.T. high wing design, an ideal trainer for the novice. Cathedral Model's Mini-Jenny, Hobby Shack's Real Thing, Hobby Lobby's Tri Spacer and Recruit are also excellent starters. Sterling Models has



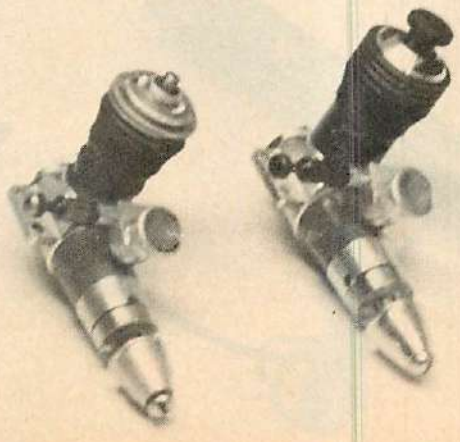
Two of the radio systems made for ½A use include the Cannon Super Mini system at **left** and the Ace 3-channel **above**. Both are small and light.

PHOTOGRAPHY: FRANK TIANO

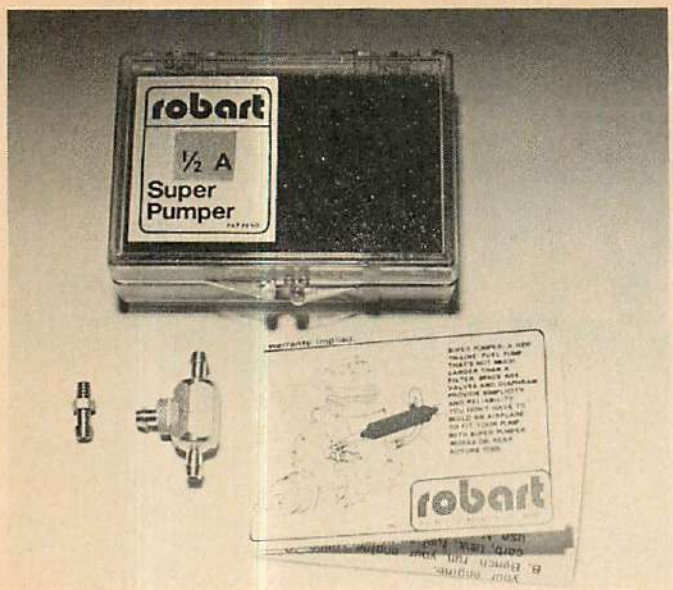
recently released their Mini Fledging and Southwestern offers their Honker and Lil Gypsy kits. The old standbys are still Carl Goldberg's Ranger 42, Jr. Skylark and Jr. Falcon, while Midwest still offers their Lil Tri Squire. As I said before, all of these ships should make excellent trainers. For the ½A Pylon racer category there are really very few models considered all-out competition ships. The few that stick in my mind are Hobby Lobby's Little Tony and Rickey Rat, Ace R/C's Upstart, Mr. G's Products G-Bird (a V-tail design), Allied Hobbies' Streaker, and the Laser, also sold by Hobby Lobby. I'm sure by the time you read this that there will be many more ½A racers available either in kit form or from magazine plans. The secret is to watch the ads in FLYING MODELS.

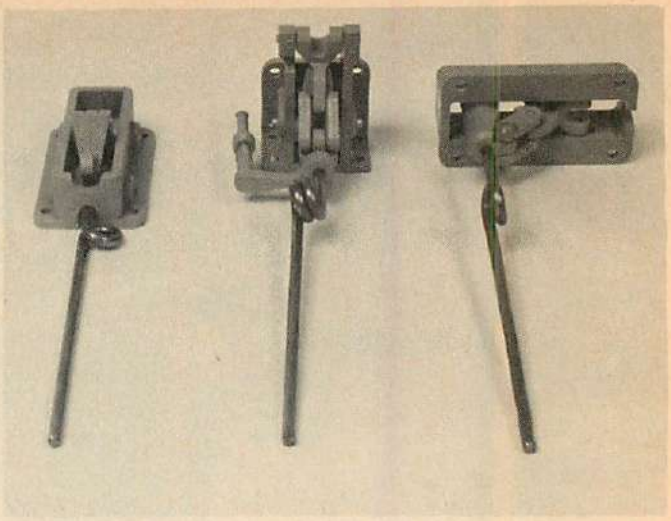
For the Sport/Pattern flier we can choose from many, many designs. At the current time, the most popular seem to be the Ace Pacer, Span Aero's Eyelash, Sureflite's Baby Birdy, Cathedral Model's Baby Banshee and Mile High Models Joy Stick. The new kid on the block was fathered by Techni Models and is called the Mini Bar Fli. These ships require a hot .049 or .051 Tee Dee engine for optimum performance. They are all very quick and groove just like a .60 powered pattern ship. Again, only two channels are required even though some die-hards have installed a third servo to give rudder control. I've even heard of a few over-zealous fliers who have installed a throttle control to allow full-house operation. By the way, a full house ½A Pattern ship is really something to see. The little ships do everything a full size ship will do only about twice as fast! The ideal weight for these types of ships to fly at is between 22-26 ounces. With normal building and finishing habits this weight can be easily achieved. With the introduction of R.S. Products Perfect Paint and Pactra's Formula U, less than one ounce is added to the finish with careful wood preparation and spraying techniques.

Last, but certainly not least, we have the scale models powered by ½A engines. In almost every instance these models were designed around the Cox .049 and .051 Tee Dee engines. These ships require a couple of extra hours building time, but no more flying experience than the pattern ships. With very few exceptions, these scale models fly exactly like a pattern bird since they share the same moments and arifoils. The most time consuming ships to build are the ones from Sterling, Guillows and Comet originally intended for rubber power. However, with careful building and trimming methods these stick and tissue types can be made to fly very well. The next most time consuming to build are the scale models from Flyline. Flyline models are really a work of art and fly very well indeed and they offer some rare subjects such as the Stearman C3B biplane, and the Kinner Sportster. The newest offerings for ½A scale come from Model Merchant with their P-40 kit that includes retracts and G.M.C. Models which offer a Corsair and a Zero. Both of these manufacturers products feature balsa fuselages and foam wings. For the ultimate in ½A scale I don't hesitate to recommend the House of Balsa's fine line of kits. These are of all balsa construction with conventional built up wings. The nicest feature of all their kits is a pre-formed durable plastic fuselage top which is a great time and weight saver. The kits come with a fine 3-view drawing as well as a multi-paged construction manual showing each step of construction with a photograph. These scale models are very realistic appearing and fly like a pattern ship with elevator and aileron controls. The head man from the House of Balsa, Don Dombrowsky is currently flying one of his FW-190A Focke-Wolfes' with five channels. In case you don't read me, that's elevator, rudder, ailerons, throttle and retracts! All up weight is 30 ounces and a Kirn Kraft T.D. 051 pulls it around at Warp 6. House of Balsa currently offers a P-51 Mustang, P-39 Airacobra, P-47 Thunderbolt, ME-109E Messershmidt, FW-190A Focke



House of Balsa's P-51 at top. Testor's new 8000 .049 is shown **above** while the shot at **right** is of two Cox .049 engines. The one at left is a stock engine while the one at right sports a Davis Deisel Development head.





Robart, a company known for coming up with products just as we need them, is offering a ½A fuel pumper at **left** and a sturdy, light set of retracts.

Wolf, a Dehaviland Chipmunk, Beech Bonanza, and a Pietenpaul. Don't tell a soul but in the works are a P-38 Lightning, a twin Beech, a Piper J-3 Cub and a Corsair.

Last but certainly not least is an offering from MH Manufacturing. Theirs is a BD5½ model featuring a pusher prop. This airplane is scale but will fly pattern and fairs very well in pylon racing as well. It is not a beginner model but is a ball to fly for the more experienced pilot.

If any of you are totally in the dark about any of these kits, just pick up a current issue of any of the model magazines and you'll find pictures, prices and specs on all of them. The Radio Control Buyers Guide is also a valuable source of information.

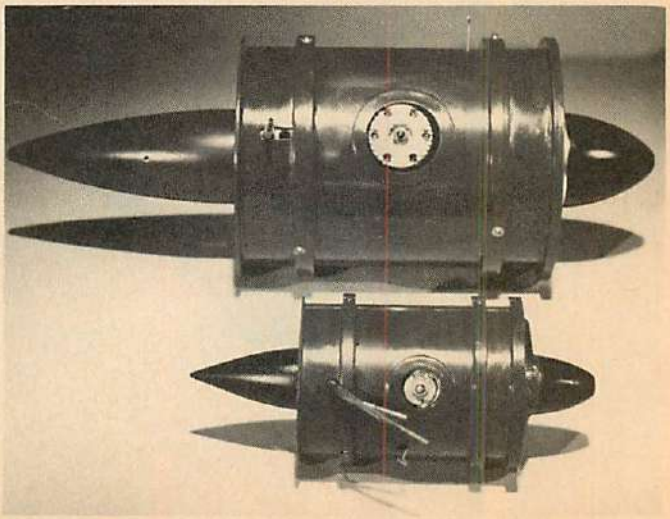
Powerplants

Currently, Cox really has the ½A market locked up. Their T.D. .049 and .051 engines are just plain hard to beat. For the average fun flier a stock T.D. .049 will provide more than adequate performance in any of the ½A kits now available. For the guy who wants something a bit different there are many modifications which may be made to spice things up. For instance, a Davis Diesel conversion may be added thus eliminating the need for a starting battery. The Davis Diesel head simply screws on in place of the stock Cox glow head and provides comparable performance. Best of all, by adding an output arm to the top of the head the engine may be throttled just like a larger engine. Full instructions are supplied with the basic Davis Diesel package. Or maybe you'd like to throttle your .051 with a beautiful new carb offered by Tarno. This little jewel just fits into the venturi of a Cox .049 or .051 T.D. engine and allows full throttle control from about 4,000 to 20,000 r.p.m.'s. The carburetors are very well made and work reliably. No special tools are required for installation and the price is below $12. If something a bit cheaper is desired, Ace R/C offers a sleeve type throttle which works very well by restricting the exhaust on any Cox ½A engine. This unit retails for less than four dollars and provides excellent throttle response. It's ultra simple to install the Ace throttle sleeve since it just slips around the cylinder sleeve. In all three cases, Davis Diesel, Tarno, or Ace, the throttles should be controlled by a separate servo. For an alternative power plant, I've heard of an electric motor being fitted to the nose of a House of Balsa ME-109 but initial flights were sub-par. I'm sure it's only a matter of time before some hot shot gets the act together and builds a super flying ½A ship powered by an electric motor.

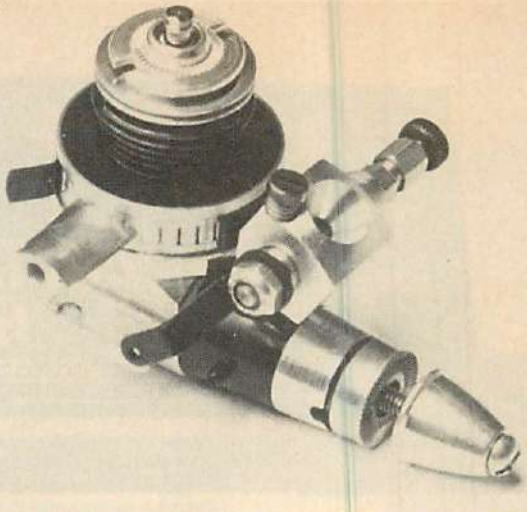
A new offering in the ½A engine field comes from Testors Corporation. It's called the 8000 and, according to their advertisements, has some very impressive horsepower and torque curves to recommend it. It's a reed valve .049 engine that has it's own fuel tank, a patented starter and comes with a muffler and prop for about the same price as the inexpensive Cox reed valve engines. This looks like a real comer in the ½A engine field.

Radios

I honestly can't say that one brand of radio is far superior to another. I do know the radios that I prefer for ½A ships but, "one



The photo at **left** shows two fine electric starters for ½A engines. The Globee Stinger is at left and the Astro Flite Mini Starter is at right.



All the glue a guy needs to build a ½A ship. Hot Stuff and Fast Tak. Tarno's new carburetor for Cox .049 or .051 engines gives great throttle response and a good idle, easy to install. House of Balsa's P-39 **(below)**.

man's cup of tea is another's poison." Reluctantly, I will mention three radio manufacturers who's products I know are of impeccable quality and who all offer a specialized system for the ½A enthusiast. By specialized I mean super small servos, receivers and battery pack with total airborne weights of less than six ounces complete. The three companies are Ace, Cannon, and Royal. All three of these manufacturers offer receivers that weigh 1.5 oz. or less. Ace offers a micro servo that measures .625" x 1.25" x 1.28" and weighs a mere .75 oz. Royal has a new ½A three channel receiver that may be expanded later on for additional functions. This three channel unit retails for less than $25 in kit form. Cannon offers mini servos that weigh about 1.2 oz. and a two channel receiver that tips the scale at one ounce. Any of these systems are reasonable buys offering durable construction for long life. Factory service is readily available. I've had the opportunity to try all three systems and I would recommend any one of them.

One item I think I should mention though, almost any radio system will fit in almost any of the ½A kits designed for two channel use. Some local club members have used a variety of other radios such as Kraft, MRC and World engines with no ill effects. Where the mini-systems play an important part is when the builder wants to install three or more channels in one of the small ships. Weight, then becomes a most important factor. For two channel use, I've used a MRC 775 with a 500 MAH battery pack in a House of Balsa P-51 and total weight was only 24 ounces. So if you currently have a larger system, by all means use it.

Accessories

I could easily take four or five pages of print and list all accessories available for ½A use. However, for now we'll just talk about the most important ones. For wheels and hardware, one should see Ace. They offer a vast assortment of wheels, spinners, engine components, and hardware for almost any ½A application. For starting our ½A engines, I strongly recommend either the Mini Starter from Astro Flight (FLYING MODELS, April 1977, pg. 26) or Fusites ½A Stinger (July 1977, p. 13). The Stinger uses a self contained rechargeable battery for a power source while the Mini Starter is more conventional and hooks up to a 12-volt starting battery. Either starter features excellent workmanship. Engine mounts are offered by Tatone, Kraft and Ace. I prefer the predrilled Tatone which is the only all-metal one offered. For props, Top Flite offers the best wood and Cox the best plastic. Retractable landing gear should be available by the time you read this and from what prototypes I've seen, I'd go with the new Robart units. For covering material, I generally like the plastics best. They're easy and fast to apply. The only paint I'd ever use on a ½A ship is the polyurethanes. One coat and done.

Well, let's see now, that should cover about one quarter of what's available at this time. If you haven't tried ½A yet, you really ought to because you'll never know what your missing. To borrow a quote from the House of Balsa, "½A Aircraft is ½ the work in ½ the time, at ½ the price, for twice the fun." I really couldn't have said it better myself.

An FM Product Review:

Midwest's Axiflow RK-40 Ducted fan

This offering from Midwest brings jet-like performance within the reach of piston pocketbooks/**Bob Aberle**

PHOTOGRAPHY: BOB ABERLE

Complete Midwest RK-40 kit. Expanded foam case keeps everything well arranged. List price is $46.95. **Below:** Ready with a paint job. A single coat of clear Hobbypoxy and two of orange (hot fuel protected).

The concept of a ducted fan model propulsion system is certainly not new. I remember several .049 powered ducted fan models offered in kit form by the Berkeley Model Company some 20-odd years ago. For the most part these Free-Flight, semi-scale models were very ineffective. Fan design, in those days, relied mostly on guess work. Although some dedicated modelers experimented for years with various fan designs it was never generally accepted as a serious form of model propulsion.

In recent years there has been a definite revival of interest in ducted fan power. With modern light weight R/C systems and retractable landing gears available, scale modelers may now add jet powered aircraft to their list of new projects. Several ducted fan kits or semi-kits, which have been marketed over the past couple of years have met with varied success. Some were quite expensive at that, putting them out of the reach of the average modeler. About three years ago, Bob Kress, an active Long Island modeler, took up the challenge of designing a ducted fan unit which would provide high efficiency at a reasonable cost. An engineering degree from M.I.T. plus over 25 years in the aircraft and aerospace industries made Bob well qualified for this project. Data compiled during the development phase of this ducted fan project fills several file cabinets. The prototypes, in several sizes, have been actively flown for the past two years by noted east coast modeler, Nick Ziroli. You may have seen Nick's F-16 scale model displayed at both the WRAM's and Toledo Shows this past season. Last year

Bob was able to interest the Midwest Products Company, 400 South Indiana Street, Hobart, Indiana 46342, in the marketing and distribution aspects of his fan design. The result being that four separate sizes of Axiflo fan units will be offered. One for .60 power, one for .40, another for .20 engines and finally a pint sized unit intended for .049 engines. Initially only the .40 and .049 sizes will be available. The remaining .60 and .20 units will be coming out around the Spring of 1978. As a matter of interest these ducted fan kits will list for the following prices: .40 size $46.95 and .049 size $34.95. Prices for the .60 and .20 size will be announced later.

For the purpose of this review I was supplied a new prototype kit intended for the .40 size engines The kit is designated as the Midwest Axiflo ducted fan, Model RK-40. A detailed description of the fan unit itself would be a good starting point. This particular model Axiflo is roughly 16 inches long, including the front spinner and the rear mounted fuel tank. The outside (barrel) diameter is 5.16 inches. The outer supporting plywood rings (four in all) bring the maximum outside dimension to 5.66 inches in diameter (which is actually the minimum size of the fuselage interior).

A special design injection molded rotor is the heart of the kit. It has a diameter of 5.04 inches and weighs 2.5 ounces. The rotor consists of five blades attached to a substantial size hub measuring 2.25 inches diameter by 1.375 inches long. An aluminum insert is imbedded in the center of the hub to provide an accurate mount to the engine prop shaft. The rotor has been spin tested in excess of 30,000 rpm without failure. Normal operating speed (with a .40 engine) will probably not exceed 20,000 to 21,000 rpm, tops! A typical Midwest style, 2¼ inch diameter spinner, is supplied with the kit to simplify starting the engine. An 8-32 X 2¼ inch machine screw is provided to attach the spinner to an engine shaft adapter nut. The adapter nut, however, is not supplied, because of the variations that exist from engine to engine. On the opposite end of the fan (rotor) is a built-in, polyethylene fuel tank. For the .40 size unit the tank has approximately a 9 ounce capacity. Other tank capacities are as follows: .60 (13 ounces), .20 (4½ ounces) and the .049 (1½ ounces). A realistic capacity for each engine size! Standard fuel tank hardware (clunk and brass tubing) for three lines is provided. I might add that the fuel tank is aerodynamically shaped to enhance the duct efficiency. Fuel tank pressurization is not required, nor is a fuel pump required due to the close proximity of the tank to the engine.

Continuing on with the description, the next item of interest are the fixed stators. Unlike other ducted fan designs the Axiflo employs *two sets* of fixed stators. One set of three stators is located directly behind the moving rotor and in front of the engine's cylinder head. A second set of three fixed stators is located behind the engine. This we feel is a design improvement over previous ducted fan designs which employed a single set of fixed stators. Both sets of stators have very definite airfoil shapes which are claimed to recover swirl energy developed by the rotor. A special fairing is provided just aft of the cylinder head for additional streamlining to further improve duct efficiency.

That just about covers the physical description. Now for a few words about the Midwest kit itself. The RK-40 consists of roughly 25 major parts along with a complete package of hardware. The only items still to be purchased are the spinner adapter nut (as mentioned before) and a set of Du Bro 6-32 X 1 inch machine screws with blind mounting nuts. No special tools are required. You will need a single specific drill (Size No. 37), along with a ¼ inch diameter countersink. A Dremel Moto-Tool with a ½ inch diameter sandpaper drum comes in handy. All assembly work can be done with model type five-minute epoxy cement. A little Hot-Stuff or Zap is helpful during the alignment portion prior to using the epoxy cement.

At first glance the kit appears a little bewildering. The individual parts are not marked. However, an identification sheet is supplied which makes the job easy. A comprehensive engineering drawing, along with auxiliary detailed views, tells most of the story. In addition, a detailed set of step by step assembly instructions are supplied. I found it helpful to spread all the parts out first and identify them. After about an hour or so I was able to roughly "hand assemble" most of the major parts and get a good idea of the techniques involved. After this first study session you can truly realize how ingenious and yet simple this ducted fan unit really is. Assembly is started with the engine mount. A special glass-filled nylon radial engine mount is provided with the kit. It will accept *any* front or rear rotor .40 size engine available on the market today. These mounts can be removed and changed. Other fan units available in recent years had to stipulate a rear rotor Schneurle ported speed engine to be able to develop a usable amount of thrust. The increased efficiency of Axiflo enables the use of any type engine in the .40 power class. I might mention that I found it helpful to use a #37 drill for the engine mount starting holes. Unless you use this correct drill you could experience difficulty when installing the #4 sheet metal screws. The motor mount pod subassembly (as I call it) is actually formed around the nylon radial engine mount using several pre-shaped plywood formers and a special, hard pressboard stock which resembles the old, dark red file folders used in the office supply business (but is much stiffer and tougher).

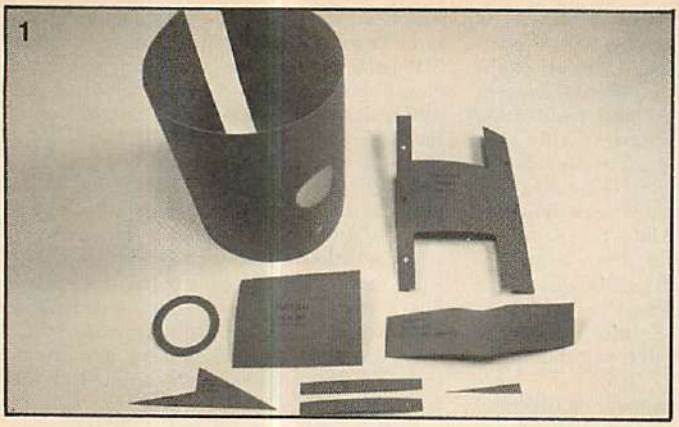
Next and most important step is the assembly of the fixed stators to the motor mount pod. You must be careful here since the front and rear stators have slightly different airfoil shapes. The ones with the greater curvature go in the front. Angle gages are supplied in the kit to establish a 27 degree angle on the front stators and a 12 degree angle on the rear stators. I found it easier to align the stators and spot glue them with Hot-Stuff. This was followed with a final coat of five-minute epoxy cement.

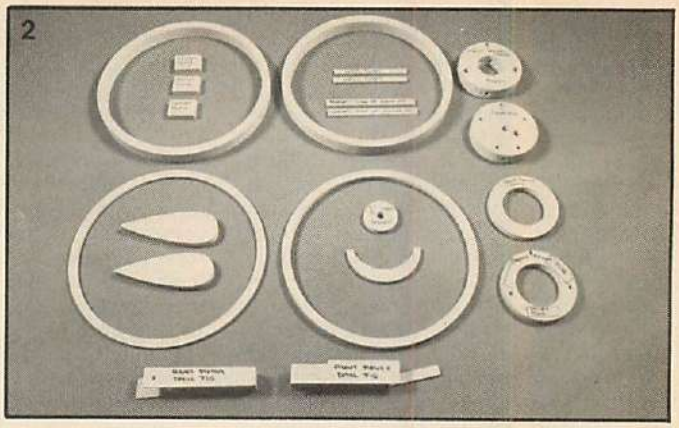
To complete the motor mount pod subassembly you must still attach the tank mount sleeve and the fuel tank itself. Instructions call for the use of RTV compound (I used Dow Corning Silicone Rubber Bathtub Caulk). An engine cover or hatch cover must be assembled out of a pre-cut piece of that dark red pressboard material along with a small plywood former. This cover can be removed at any time to service or change the engine. Final item is the all important cylinder head fairing. As stated on the plans it is functional and it can increase the static thrust by approximately 3 to 5%. The fairing is simply teardrop shaped, made out of the red pressboard material and two 3/16 inch plywood formers. In my particular case I chose the new K&B 6.5 (.40 displacement) front rotor engine which happens to have a rear exhaust port. Using a K&B mini-pipe exhaust extension I was able to cut a hole in the cylinder head fairing which permits the exhaust pipe to pass through it (with a slight upward angle). This was actually a little tricky but I felt well worth the little extra effort. If your particular engine has a conventional side mounted exhaust stack this won't be any problem at all. By the way, the cylinder head fairing actually attaches to the engine hatch cover. Both are removable.

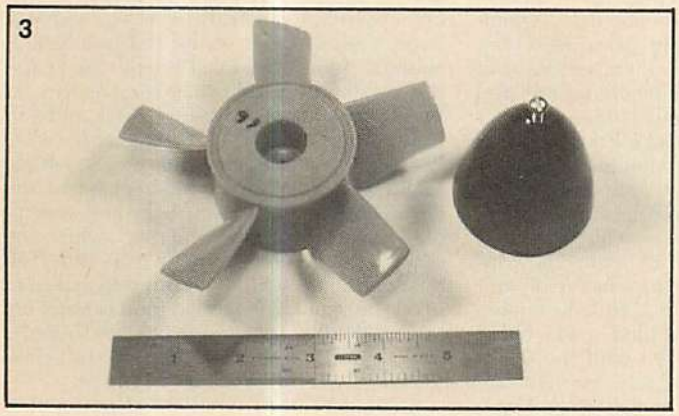
Putting the engine pod sub-assembly aside, the next and final component is the outer barrel. Again Midwest has provided a large, pre-cut sheet of the red pressboard material. I might add that I really got to appreciate this material (whatever it really is!). It is approximately .019 inch thick and yet has as much strength as 1/32" inch plywood. Besides it's strength it bends easily, which in this case is essential. The sheet is actually formed into a cylindrical shape and assembled inside of four plywood rings, which act as retainers. A little trimming (very little!) of the pressboard will be required to make an exact butt joint. An overlap joint can not be tolerated since it would make the "barrel" out-of-round. Again I used Hot-Stuff, followed by five-minute epoxy cement.

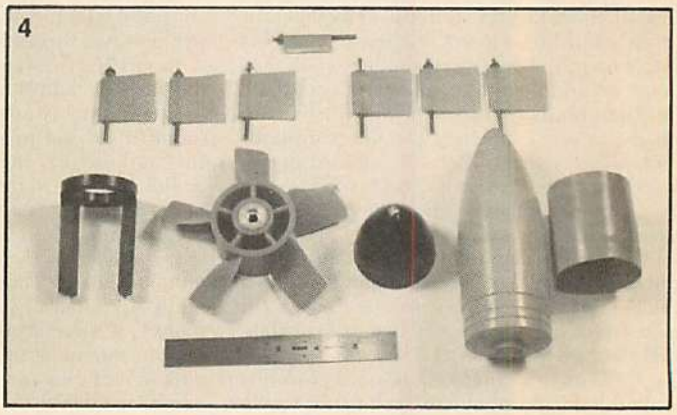
Final assembly involves slipping the motor mount pod (with the stators attached) inside the outer barrel. After careful alignment you must drill through the outer barrel (use that #37 drill again) to pick up the tapped hole on the end of each fixed stator. Two separate drill jigs are provided which greatly simplifies this drilling operation. In addition to the six fixed stators there is also a small center body support located on top of the front stator ring. This mounts as if it were a forth fixed stator. In the case of front rotor engines this center body support must be trimmed to clear the carburetor. Because of the combination of plywood and pressboard construction you will have to paint or at least seal the fan unit to prevent damage from the hot fuels. I chose a simple approach consisting of one coat of Hobbypoxy clear followed by two coats of a color (orange in my case). Brushing would seem to be the best way. The configuration does not lend itself well to paint spraying. That completes the Axiflo assembly. Total assembly time for me on this particular prototype kit was around 14 hours. This included the hour spent reading the instructions and sorting out the parts. Total weight of my fan unit was 16.5 ounces, less engine and 28.0 ounces including the K&B 6.5cc engine.

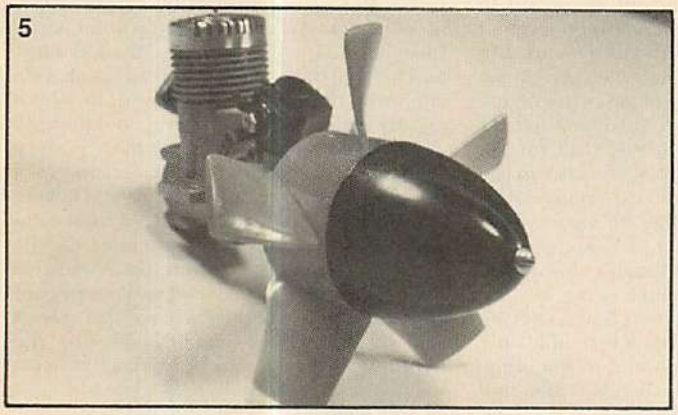
Individual parts will be available for each fan unit should any repair ever be necessary. Damage could result from a model crash, for example. There is also the possibility of ingesting an object such as a rock or stone into the rotor during a takeoff run. This, in turn, would more than likely damage the rotor and possibly the fixed stators as well. The tentative parts list supplied in my kit indicate that an RK-40-35-1 rotor would cost $11.95. That, in fact, is the single most expensive item in the entire kit. Stator sets of three will cost $5.95 and the motor mount $2.95 (these prices apply only to the .40 powered fan parts). Replacements and maintenance shouldn't prove any problem.

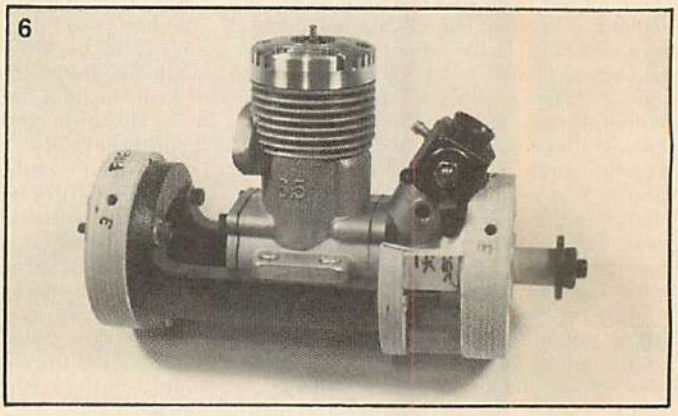


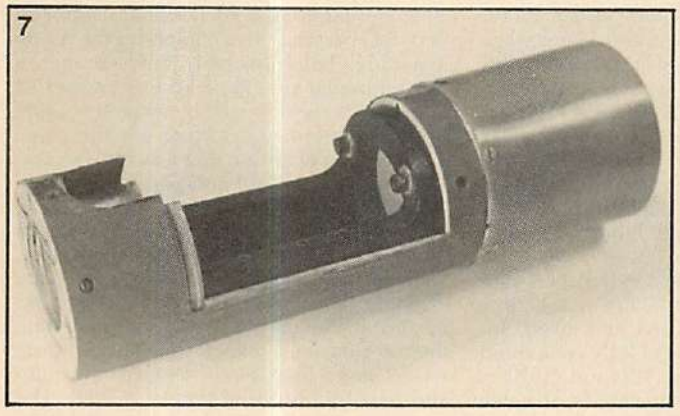












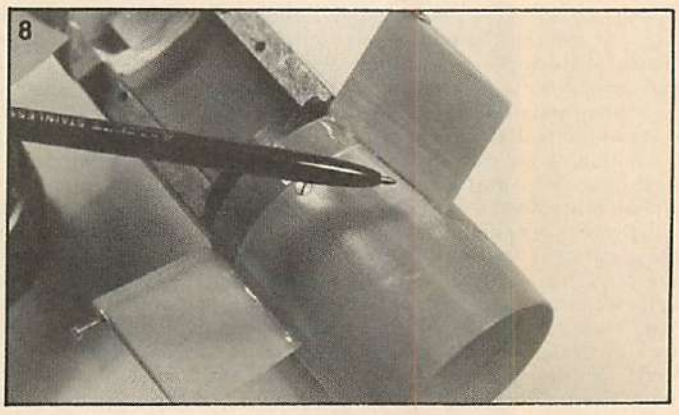
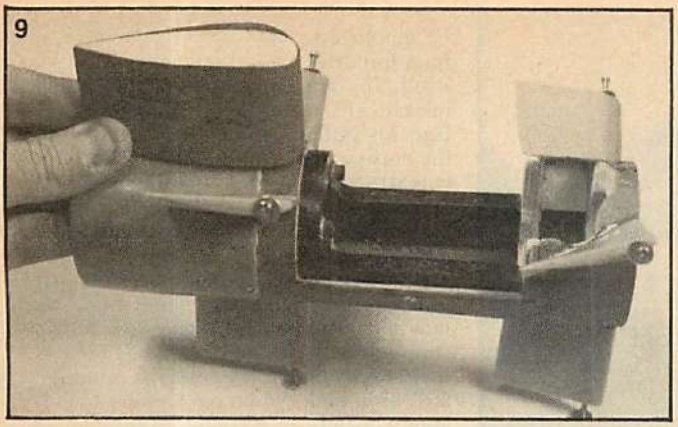
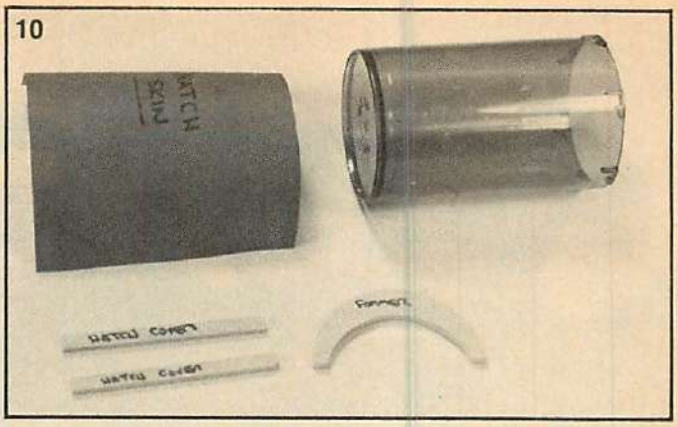
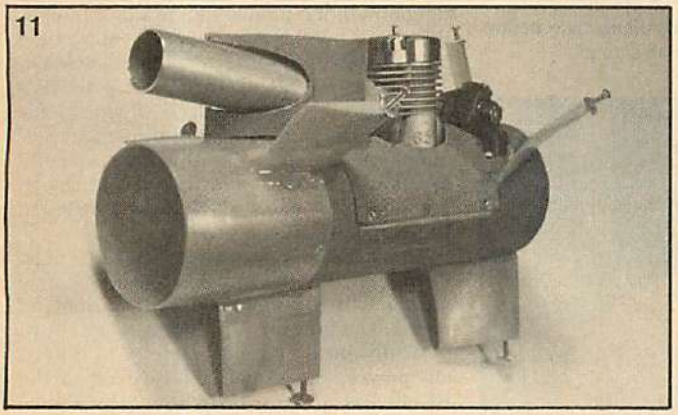


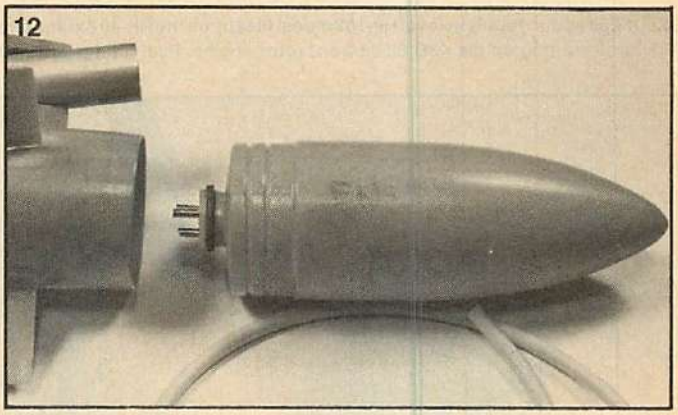
Photo 1: .019 red pressboard material rolls into cylinder to form duct. It's tough, yet flexible. **Photo 2:** Accurately machined plywood formers, no sign of edge chipping. Note the drill jig in foreground. **Photo 3:** Injection molded rotor is a little over 5" dia. Spin tests reached 30,000 rpm. Normal range will approach 20,000 rpm. **Photo 4:** molded pieces supplied; glass filled nylon engine mount, fixed position styrene staters, polyethlene fuel cell included.

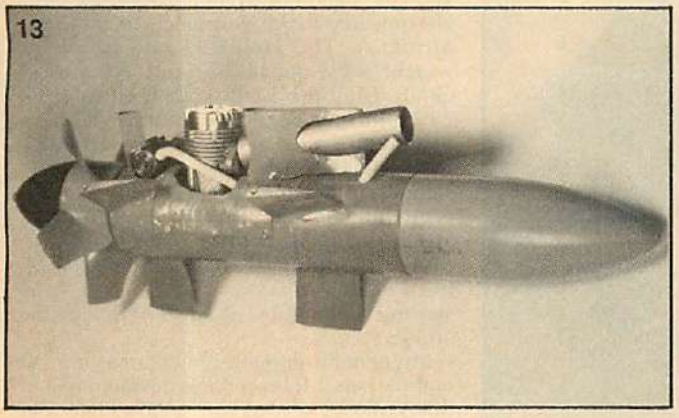
Photo 5: Complete engine pod with tank. It measures 16" from spinner to end of fuel tank. **Photo 6:** Outer barrel is easily assembled within four pre-cut machined plywood rings, it takes very little time. **Photo 7:** Engine mount pod sub-assembly partially completed, red pressboard material is wrapped around ply formers and epoxied. Tank mount sleeve is at right. **Photo 8:** Sand tank sleeve material to make a good joint. Adhesion is not a problem.

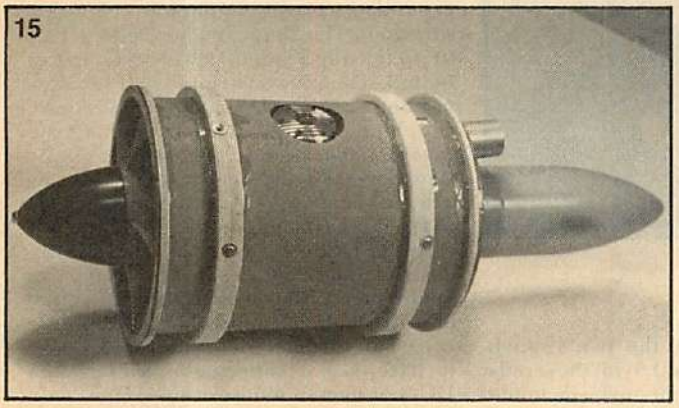












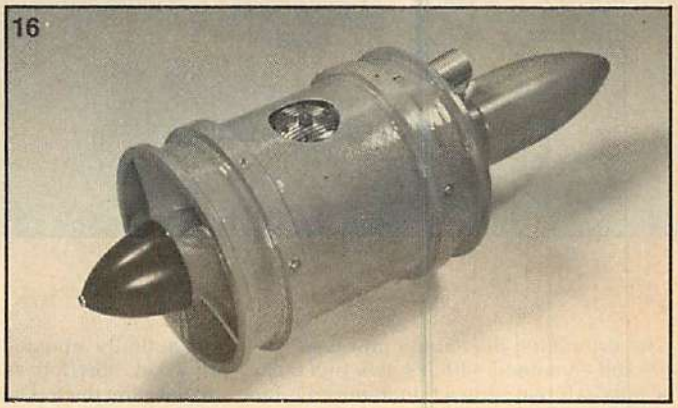
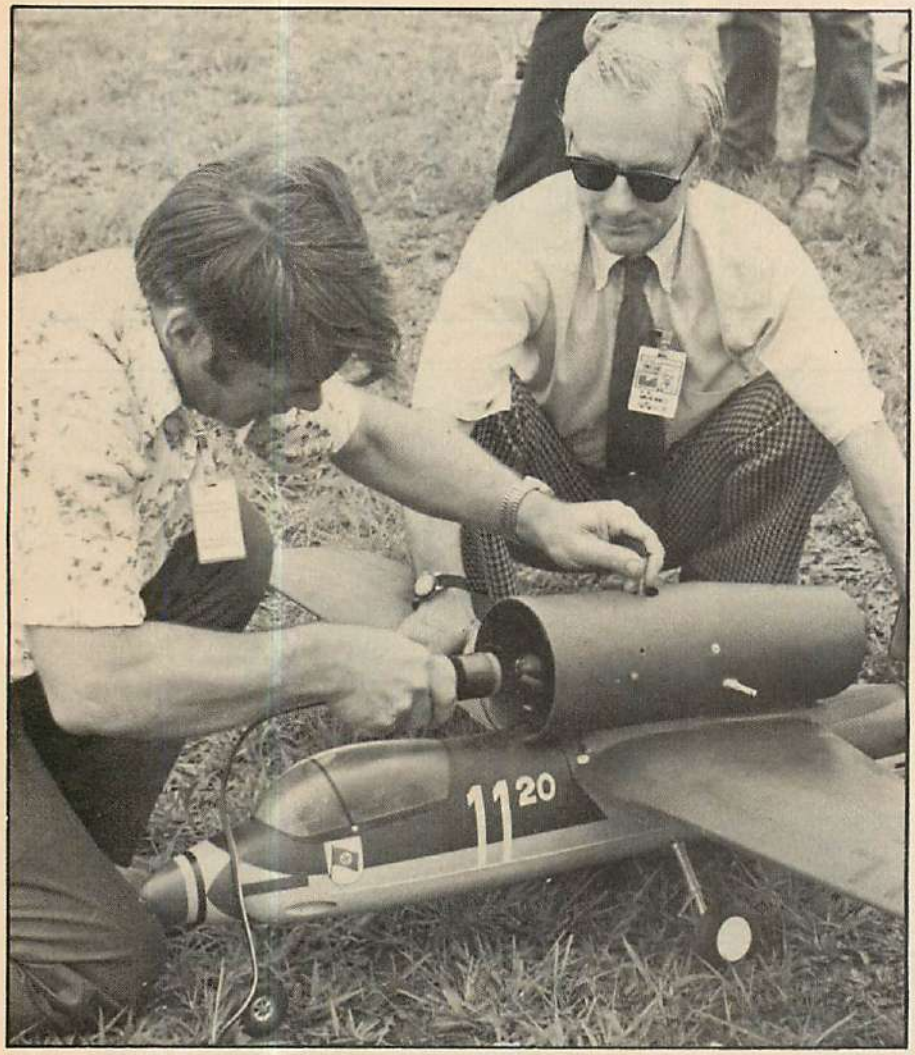


Photo 9: Complete engine mount pod sub-assembly. Bob's holding the cylinder head fairing in position. It really mounts further forward and directly to the engine hatch cover (not shown). **Photo 10:** Engine's hatch cover is formed around a 2" dia. medicine bottle. **Photo 11:** Rear view of pod sub-assembly ready to fit the outer barrel. Cut out for K&B mini-exhaust pipe. **Photo 12:** A 9 ounce tank supplied. Grooves hold it with RTV compound.

Photo 13: A 2¼" dia. spinner is included, though a prop nut adapter must be purchased. Bob used a K&B front rotor 6.5cc engine. **Photo 14:** Beginning of assembly process. Plywood formers are first attached to nylon engine mount. **Photo 15:** Fully assembled RK-40 just prior to a final paint job. **Photo 16:** Mounting and installation details are covered in the text. Such ducted units open up new possibilities for modelers simulating jet aircraft.

What it's all about: Nick's Heinkel He-162 model flies by on the RK-40 Axiflo unit at a Grumman site. **Below:** Nick Ziroli starting up his K&B 6.5cc front rotor engine. Fuel fittings are visible on shroud.



The completed ducted fan unit is essentially self contained with it's own fuel tank. The only external connection required is for the throttle. You must also provide for a needle valve extension accessible to the outside of the fuselage. Mounting can be done in several ways. Various suggestions are mentioned in the instructions and on the plans. One involves the addition of two, ⅜ square X 6 inch long spruce rails which are attached on opposite sides of the outer barrel. They are actually epoxied to the two ½ inch plywood rings (fore and aft). With these rails in place the ducted fan unit can be mounted to the aircraft structure with four sheet metal screws. Using this technique you could easily shift the ducted fan from one model to another just as you would an R/C system.

I chose not to install a muffler on my prototype. It could have been done but only at the expense of the rear cylinder head fairing. Normal side mounted mufflers could easily be employed. Mufflers will, however, detract from the overall efficiency of the fan itself. In actual practice the duct unit or module sits well inside an enclosed fuselage. My initial feeling is that a good deal of the noise will be continued within the fuselage structure. As such a muffler may not be necessary unless your local flying site has a particular problem associated with engine noise.

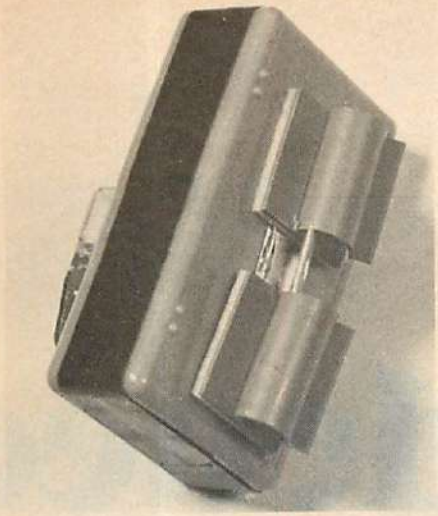
I can't give you any real test details on my unit because the K&B engine was brand new and not broken in. A static thrust chart is supplied with the instructions. It indicates that a K&B Schneurle ported .40, running on 25% nitro fuel, should have a rotor speed of approximately 18,000 rpm. At this rpm the available thrust is estimated at 6.65 pounds. Recommended model weight maximum for this thrust level is 9.0 pounds. If you went to 50% nitro fuel the thrust would be raised to 7.31 pounds and a model of up to 10.0 pounds total weight could be flown. Complete charts with estimated thrust and recommended model weights will be available for all four fan units from Midwest. Prospective model designers would be interested in these specifications.

This particular .40 powered Axiflo will be used later this fall in a new "fan jet" style trainer which I now have on the drawing board. The purpose of this design will be to basically introduce the modeler to ducted fan power. A second prototype kit of the RK-40 has already been flown by fellow modeler, Nick Ziroli in his existing Heinkel HE-162 Stand-Off Scale (construction article appeared in the November, 1975 FLYING MODELS). The Heinkel, with a full up weight of 7½ pounds, can roll in a vertical climb using the K&B 6.5cc front rotor on 25% nitro fuel. For the near future Nick has a Stand-Off scale Douglas A-4 Skyhawk almost complete which was specifically designed around the RK-40 Axiflo. It is expected to be featured as a full construction article in an upcoming issue of FLYING MODELS. Additional comments will be offered on ducted fan installation and engine starting techniques in Nick's forthcoming article.

My general opinion now is one of great enthusiasm. I followed the development of this Axiflo for several years with a somewhat passive attitude. When I finally had a chance to build up a prototype unit I was pleasantly surprised. The kit quality is excellent. Parts fit well with a minimum of trimming required. The plywood rings were precision machined without the slightest indication of any chipping on the edges. The entire Axiflo involves some pretty clever engineering design. Several nights work and you will have a ducted fan power unit that is probably one of the most efficient on the market today.

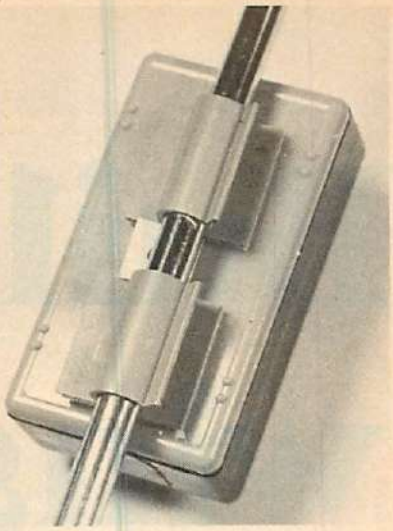
In the future I can see all kinds of new designs appearing in kit form and in the model press. Now you have the possibility of scale jet aircraft appearance and performance. Pairs of ducted fan units could be used in nacelles to produce a Stand-Off scale DC-9 or even a Gulfstream II. How about four .049 fan units powering a Boeing 707 or 747 for that matter? Remember also, you won't have any broken propellers with this type of propulsion system. And finally don't rule out applications for Controline, boats and cars as well. The Axiflo opens an entire new era for all of modeling. Write to Midwest and ask for their detailed brochure.

PHOTOGRAPHY: BOB ABERLE



An FM Product Review:

RS System's RS-RFM



Check your signal with this simple radio frequency meter/**Bob Aberle**

A new RF (radio frequency) Output Meter has just recently been introduced by RS Systems which they designate as their model RS-RFM. This RF indicating device has been designed so that it can easily be attached to the whip antenna of any existing radio control transmitter. The actual unit is housed in one of the standard RS molded nylon receiver cases, measuring 2½" long × 1⅜" wide × ¾" thick. Weight is approximately 1½ ounces. Two small plastic clips are attached to the rear of the RF meter with double sided tape. These clips permit the meter to be attached to the whip antenna. A small silver plated strip, located between the two mounting clips, actually makes electrical contact with the antenna.

The circuit itself is extremely simple. It consists of a small meter (with a 1" square face), a 1N277 diode and a 50k ohm subminiature potentiometer. The ground lead in this circuit is actually connected to a piece of single sided printed circuit board material. The close proximity of this P/C board to the whip antenna provides the necessary capacitive coupling to complete the circuit. A very clever set up! The small potentiometer has been adjusted at the RS factory so that a mid range meter reading is approximately equal to a 500 mw (500 milliwatts is actually the same as a 1/2 watt) output signal. Although the instructions indicate that the meter is calibrated for use on the 72 mHz R/C band the device itself does not contain any tuned circuit. As such I found it was also useful on both six meters and the 27 mHz frequencies. But keep in mind that the readings obtained are relative and should only be used as a guide.

In actual operation you first clip the meter to your transmitter antenna. The location of the meter on the whip antenna is *very important*. The exact mid-point is the location established by the RS engineers and used by them during their calibration of the meter. If the meter is moved closer to the transmitter case the reading will be low (in some cases no reading at all). As you go up to the top of the whip antenna the readings get higher until it finally goes off scale. Once the meter is located correctly at the mid-point, turn on your transmitter. Hold the case with both hands and stand with your feet squarely on the floor, then observe the meter reading. It would be wise to write down both the meter reading and the distance of the meter from the top of the transmitter case. I was able to get exact repeatability each time when I took the trouble to locate the meter at the same point on the antenna. I tried the meter on the following brand transmitters; Kraft, Pro Line, Ace, Cannon and Cox/Sanwa. Each output reading was roughly what would be expected based on the manufacturers published specifications. But again this is all kind of relative since the exact location of the device is so important. In general the small mounting clips provided will only enable the meter to attach around the midpoint of the antenna. It can't readily be attached to the lower end because the whip antenna's diameter is too great. Conversely it won't attach at the top end because the fit would be so loose that the device would fall off before you could take a reading.

A worthwhile accessory gadjet for any transmitter, measures radiated output, attaches to the antenna. The RS-RFM offers you a calibrated reading, not a simple on or off. Mid scale is 500mw.

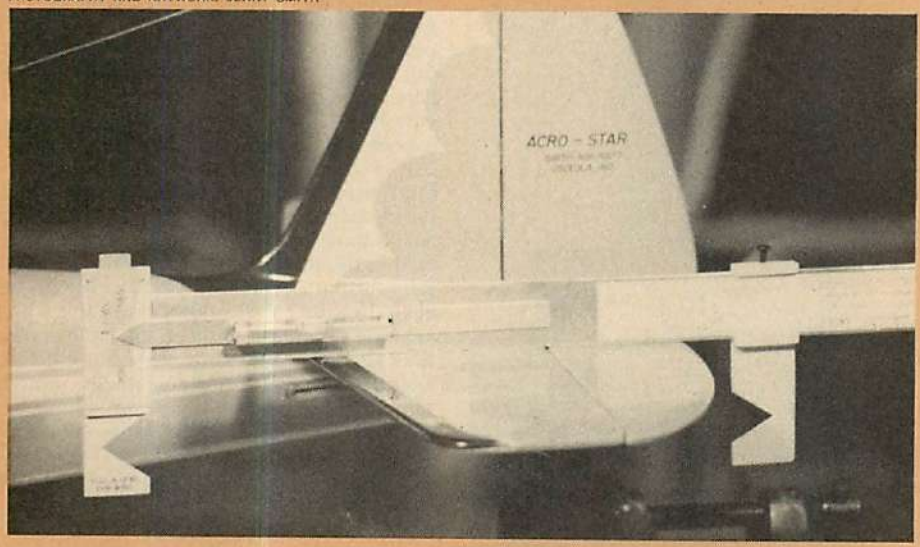
After considerable use I did find that the double sided tape didn't hold too well. As a result my plastic mounting clips came loose quite often. If you break one of these clips, replacements can be obtained from RS. The instructions indicate that the meter should not be left on the antenna during normal use. It doesn't have any effect on the output, but since the meter is a precision device it could easily be damaged through regular use. This would be especially true if you tried to collapse your whip antenna and forgot that the meter was attached. It could happen easily. Quite frankly I feel it shouldn't be permanently attached to the antenna for safety reasons. If a flyer took his eyes off his plane in an attempt to read the RF output indicated on the meter he could conceivably creash his plane in the process. Don't ever take your eyes off the plane when in flight, for any reason.

This RF indicating unit would be best suited for a transmitter which doesn't already have such a device built-in (many do not). Some transmitters have output meters that perpetually read beyond full scale which is of little value. In both of these cases the RS-RFM Output Meter would be a welcomed accessory item.

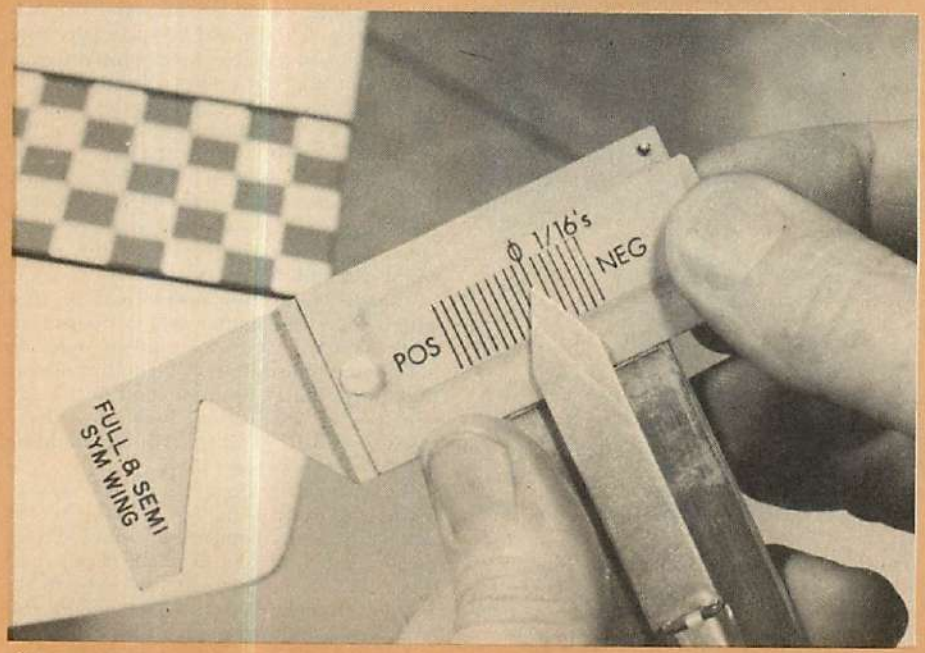
If you haven't already guessed, no batteries are required. The device works strictly on the radiated energy emitted from the antenna. List price is $23.95 (that's right 24 bucks!). For further details write to RS Systems, A Tech Serv Company, 5301 Holland Drive, Beltsville, Maryland 20705.

Build a wing incidence

PHOTOGRAPHY AND ARTWORK: JERRY SMITH



Rest Wing Incidence Indicator on stab. Final leveling is concluded by moving the pointer to absolute zero with bubble centered. **Beneath:** Scale indicator is carefully adjusted to zero. Do not move pointer.



One of the most overlooked aerodynamic trim aspects on our R/C model aircraft is the wing incidence, or angle of attack. Angle of attack is generally described as the acute angle between the chord of an aircraft wing, or other airfoil, and its direction relative to the air. This means little to the rank beginner because of the enormity of the many aspects required in building and learning about R/C miniature aircraft. However, when the day finally arrives to test fly his very first R/C model, proper wing incidence may very well play an important part in success.

Let's look briefly at what happens to wing incidence during the building phase and also its effect on flight.

It could all begin with the purchase of an R/C kit. For the most part, kit manufacturer's do a good job of cutting accurate parts. Especially fuselage sides. The success of their product depends to a great extent on the accuracy of the parts supplied. However, with high quantity runs quality sometimes slips, and the parts begin to change over a long run. It could be that the kit you have just purchased has fuselage sides with built-in negative wing incidence. This is not the general rule, but it is certainly a possibility. It is the first place where wing incidence can go awry.

As the airframe of your model takes shape, and you reach the point of fitting the wing to the fuselage, generally it is necessary to do some sanding on the wing mount. For some reason they never seem to fit. Some modelers in an attempt to improve this condition, get carried away by over-sanding and thereby changing the built-in accuracy provided by the kit manufacturer. Here again is a consideration for the modeler. That is, to fit the wing properly without changing the incidence provided. This is another structural step where wing incidence can become abnormal.

There is still another place where you can get into trouble with wing incidence and that is when installing the horizontal stabilizer. No matter how much care is taken with the wing mount, it is the angular difference between the horizontal stabilizer and wing chord that make up the correct wing incidence. If the stabilizer is mounted incorrect-

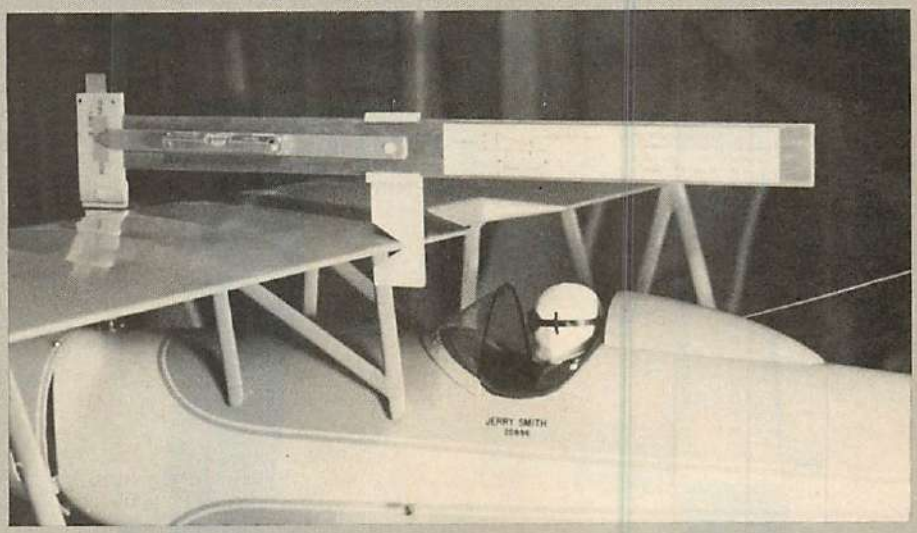
indicator

If you're not one of those lucky folks with calibrated eyeballs and micrometers instead of fingers, this simple device will do the figuring for you/**Jerry Smith**

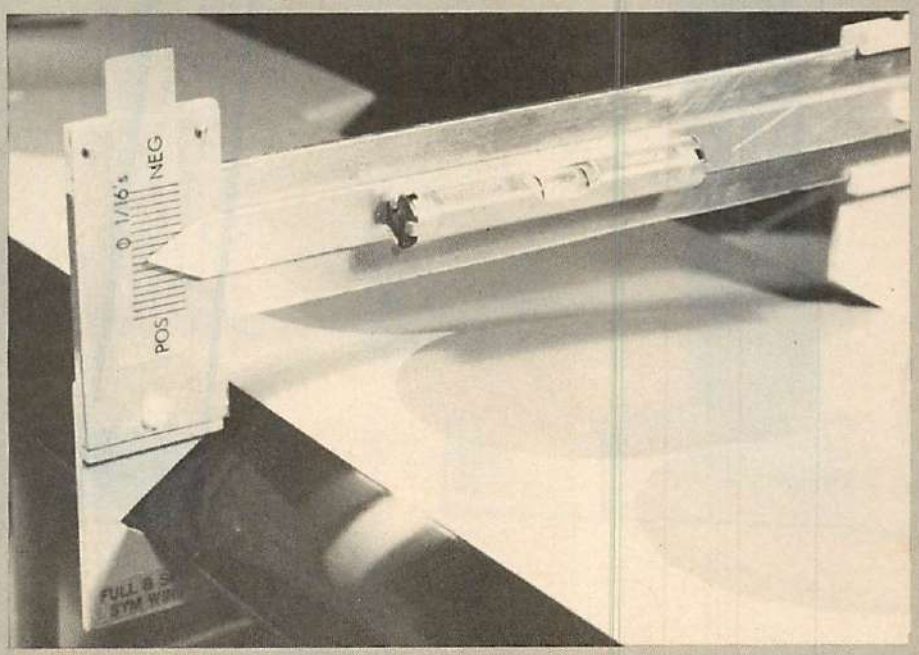
ly, say with positive incidence, it will cause the tail to fly higher. If we keep raising the front of the stabilizer, at some point the wing will go negative. This very thing happens when you apply down elevator control. The tailplane angle of attack increases to the point where the wing goes negative causing the aircraft to change pitch. In this case, dive. Thank God for elevators. From this explanation, you can see what would happen with a wing with built-in negative incidence. Yes, (depending on how negative) with enough up elevator, it would be possible to get it off the ground, however, trying to establish level hands-off flight would be hair-raising and all but impossible.

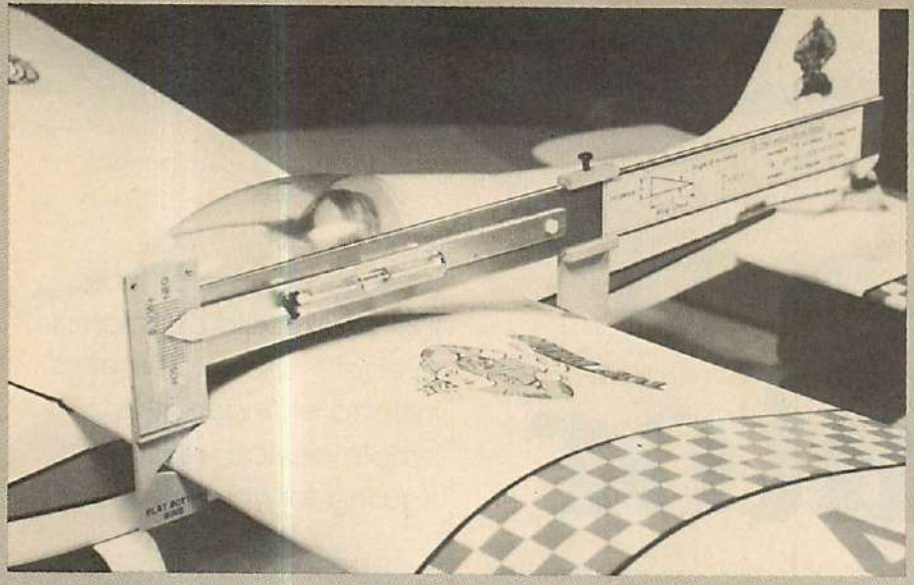
While flying one day, a friend of mine indicated he had a problem with his model. Flying at half throttle, the aircraft responded normally and trimmed out hands off. But, as more throttle was added, it went into a shallow dive. This condition was absolutely predictable and would happen each time with wide open throttle. Later the problem was finally solved. In checking out the wing incidence it was found to be slightly negative. The negative condition did not take effect until the aircraft had reached a higher speed level. This illustrates that it would indicate the faster the aircraft flies the more sensitive it is to the wing incidence angle. In this case it was possible to fly the airplane.

Here is another (personal) experience. I was unlucky at No. 1 pylon when my racer bit the dust. (This ole man just couldn't get it all together that day.) After rebuilding the fuselage and wing I took it out for a test flight. The minute it left the ground, I knew I was in trouble. The aircraft was absolutely impossible to hold in level flight and acted as if the elevator servo was not centering properly. A little up gave lots of up. A little down gave lots of down. And there it was, impossible to hold in level flight. Under these conditions a beginner would have surely crashed and never known why. After a stormy but safe landing, I took the model home to study the problem. What had gone wrong? It had flown great before. Carefully looking it over, I discovered the wing had considerable negative incidence. During the rebuilding program, I had forgotten to check for this condition. A wing incidence

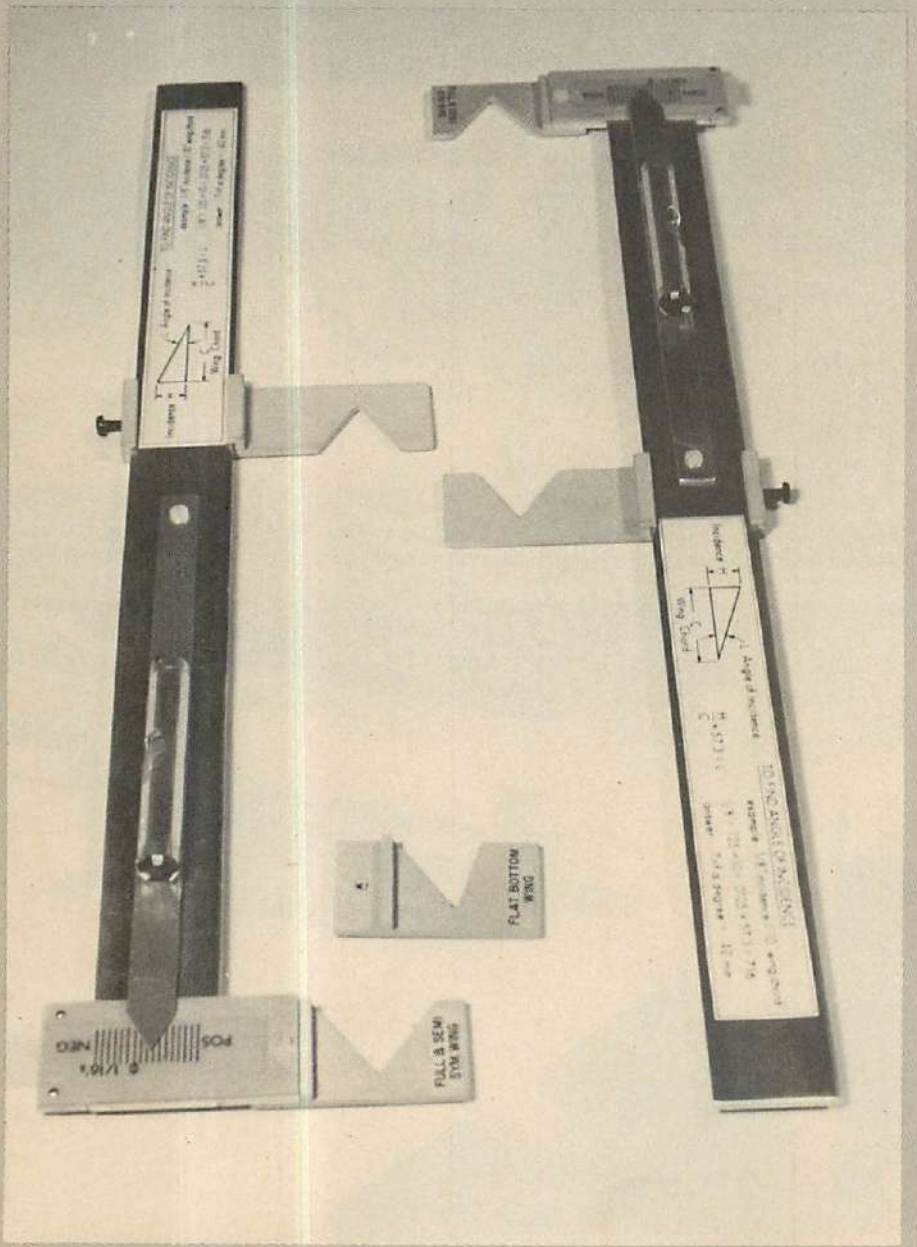


Wing Incidence Indicator is seen clamped in position to check angular difference between wing and tail. **Below:** Indicating over 1/8" positive incidence. A removable clamp for full and semi-symmetrical airfoils.





The author's racer after a touch of negative incidence was discovered. Note the split between wing and fuselage where a shim of incidence was added. It now records a positive condition. **Below:** Deluxe version is simple to build and accurate. A handy accessory, your ships will trim out better for first flights.



change was incorporated and now the old bird flys as it used to.

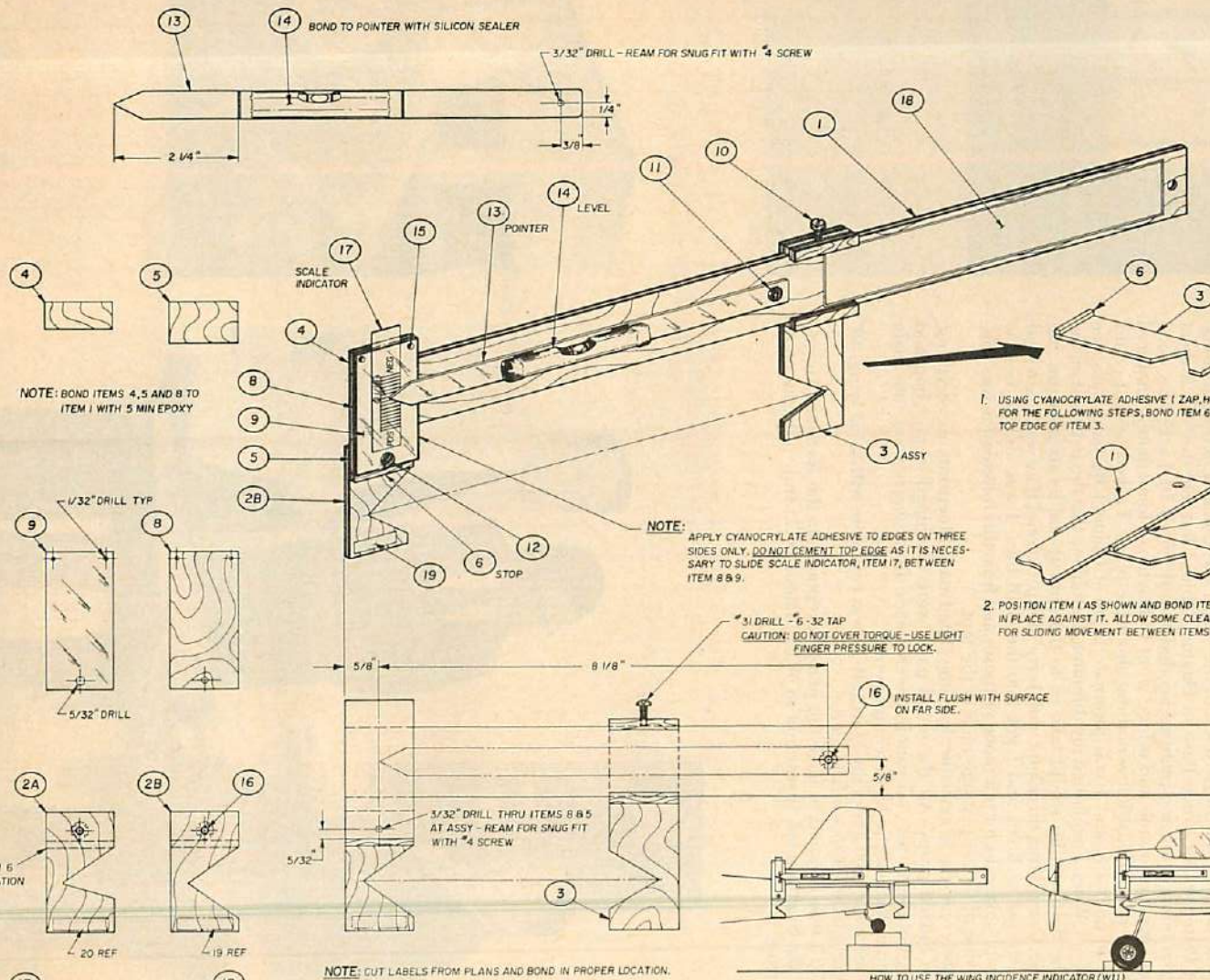
After the above experiences, it occurred to me that an instrument for measuring wing incidence would make a necessary and important workshop accessory. And so after a month of muddling the wing incidence indicator (WII) was born. Number one prototype was made completely from a wooden yardstick. That is except for the hardware and pointer. Number two version was made with Sig Lite Ply which is readily available at most hobby shops. This worked out quite well and gave the appearance of a more professional piece of equipment. Besides, at this point, my ambition level was waning and I didn't care about sanding off ink numbers just to make it look professional. And finally, the deluxe version which combines lite ply with an aluminum beam. This version is shown in the photos. If you cannot obtain the aluminum, then it is best to stick with the ply version as shown on the plans.

As a matter of interest, here are some of the outstanding features of the WII. It will measure positive or negative wing incidence in 1/16's. The adjustable indicator scale eliminates the necessity of having the model absolutely level when taking a measurement. For greater accuracy in measuring, the end clamp is replaceable with configurations to accommodate either flat bottom or semi and full symmetrical airfoils. A handy small angle formula helps compute angle of incidence in degrees and minutes. It can be used to check wing warpage as well as wing wash, and best of all, it can be built for under five dollars.

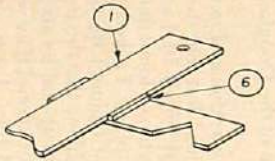
Using the WII is rather simple and straightforward. Grab yourself a clear, flat spot to rest your airplane and chock the wheels to keep it from rolling. Block up the tail until the horizontal stabilizer is reasonably level. By reasonably, I mean within the range of the WII. Rest the WII on the stabilizer and move the pointer until the bubble in the level is centered. This is where the final leveling of the tail takes place. Remove the WII from the stabilizer being extra careful not be disturb the pointer. Now adjust the scale indicator to line up with the pointer at zero position. (If this cannot be done, then go back and level the tailplane better.) The adjustable scale makes it unnecessary to accurately level the tailplane.

The WII is now ready to measure incidence and must be set up this way for each airplane you measure. Carefully clamp the Incidence Indicator to the wing, 3-4" outboard from the fuselage. If the aircraft wing has ailerons, be sure they are in the neutral position. Move the pointer until the bubble in the level is centered. Now read incidence, (positive, negative or zero) on the scale. It is entirely possible to interpolate and read 1/32's if desireable. If by chance your plans call for angle of incidence, then convert the height measurement to degrees and seconds with the handy small angle formula provided. For greater accuracy, it is best to average several readings.

The WII is an accurate instrument. Of course its accuracy is dependent on your building skills. Build it carefully and you will be rewarded with complete confidence in knowing that your next untested bird has correct wing incidence. For that matter, it is a good idea to check all your models. You might be surprised. I was!

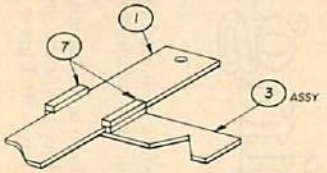


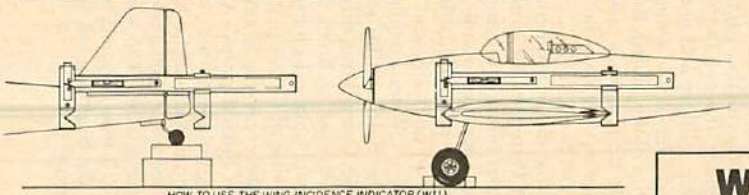
1. USING CYANOCRYLATE ADHESIVE (ZAP, HOT STUFF, JET) FOR THE FOLLOWING STEPS, BOND ITEM 6 FLUSH WITH TOP EDGE OF ITEM 3.



2. POSITION ITEM 1 AS SHOWN AND BOND ITEM 6 IN PLACE AGAINST IT. ALLOW SOME CLEARANCE FOR SLIDING MOVEMENT BETWEEN ITEMS 1 AND 6.

3. WITH ITEM 1 STILL IN PLACE BOND ITEM 7 (2) IN PLACE CAPTURING ITEM 3 ASSY. WHICH MUST MOVE FREELY THE ENTIRE LENGTH OF ITEM 1. NOW REMOVE ITEM 3 ASSY AND APPLY ADHESIVE TO INSIDE JOINTS.





HOW TO USE THE WING INCIDENCE INDICATOR (WII)

BLOCK UP TAIL OF AIRPLANE UNTIL HORIZ STAB IS REASONABLY LEVEL. REST THE WII ON STAB AND MOVE POINTER UNTIL BUBBLE IS CENTERED IN LEVEL. REMOVE FROM STAB BEING CAREFUL NOT TO MOVE POINTER. NOW ADJUST SCALE INDICATOR TO LINE UP WITH POINTER AT ZERO POSITION. THE WII IS NOW READY TO MEASURE WING INCIDENCE.

CAREFULLY CLAMP TO THE WING APPROX 3-4" OUTBOARD FROM THE FUSELAGE. BE SURE AILERONS ARE NEUTRAL. MOVE THE POINTER UNTIL THE BUBBLE IS CENTERED IN LEVEL. NOW READ INCIDENCE, POSITIVE OR NEGATIVE, ON SCALE. FOR ANGULAR COMPUTATION USE SMALL ANGLE FORMULA. FOR GREATER ACCURACY IT IS BEST TO AVERAGE SEVERAL READINGS.

MATERIAL LIST

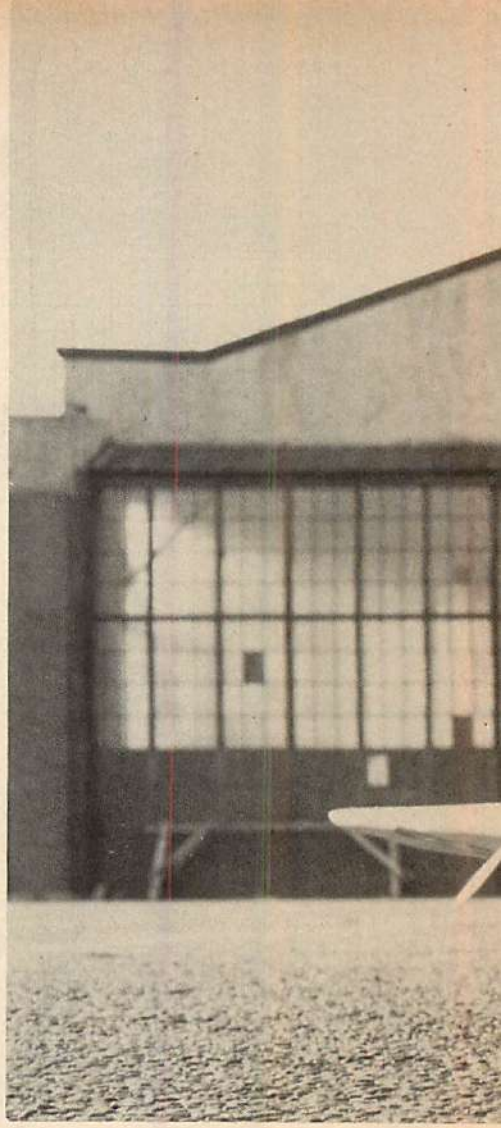
ITEM	SIZE	QUAN.	DESCRIPTION
1	1/8" x 1 1/4" x 18"	1	LITE PLY OR ALUMINUM
2	1/8" x 1 1/4" x 2 3/16"	1	LITE PLY
3	1/8" x 1 1/4" x 3 13/16"	1	LITE PLY
4	1/8" x 1/2" x 1 1/4"	1	LITE PLY
5	1/8" x 3/4" x 1 1/4"	1	LITE PLY
6	1/8" x 1/8" x 1 1/4"	3	LITE PLY
7	1/8" x 3/16" x 1 1/4"	2	LITE PLY
8	1/32" x 1 1/4" x 2 1/2"	1	AIRCRAFT PLY
9	.015 x 1 1/4" x 2 1/2"	1	CLEAR PLASTIC
10	#6-32 x 3/8"	1	NYLON SCREW
11	#4-40 x 1/8"	1	NYLON OR STEEL MACH SCREW
12	#4-40 x 1/4"	1	STEEL MACH SCREW
13	.040 x 1/2" x 8 1/2"	1	ALUM. STRIP
14	#H1287	1	STANLEY LINE LEVEL
15	PIN	2	COMMON STRAIGHT PIN
16	#4-40	3	BLIND NUT
17	.005 x 5/8" x 2 1/2"	1	MYLAR OR HEAVY PAPER
18	LABEL	1	CUT FROM PLANS
19	LABEL	1	CUT FROM PLANS
20	LABEL	1	CUT FROM PLANS

ADHESIVES REQUIRED:
CYANOCRYLATE ADHESIVE (ZAP, HOT STUFF, JET)
5 MIN EPOXY
SILICON SEALER
RUBBER CEMENT OR WHITE GLUE (FOR BONDING LABELS)

WING INCIDENCE INDICATOR

DESIGNED AND DEVELOPED BY JERRY SMITH

Barnstorming



I looked skyward and there, in a group, were the B-10s. It was a Memorial Day parade in the Bronx, NYC back in the late '30's and it was the custom for army planes to fly over the parades on this occasion.

As a kid, I fell in love with this aircraft. Jim Walker, a pioneer in model aviation manufactured a five cent glider, it was a B-10. I must have bought a dozen over the years—It flew majestically, looping, gliding and going on imaginary bomb runs. As I grew up I always wanted to build a model of this wonderful aircraft.

The first deliveries of the Martin B-10 were made to the Army Air Corps in the middle of 1934 and in 1935 the ships were in operational units. It was an advanced ship for it's time but it's operational life was very short because of the introduction of the Douglas B-18 and the 4-engined Boeing B-17.

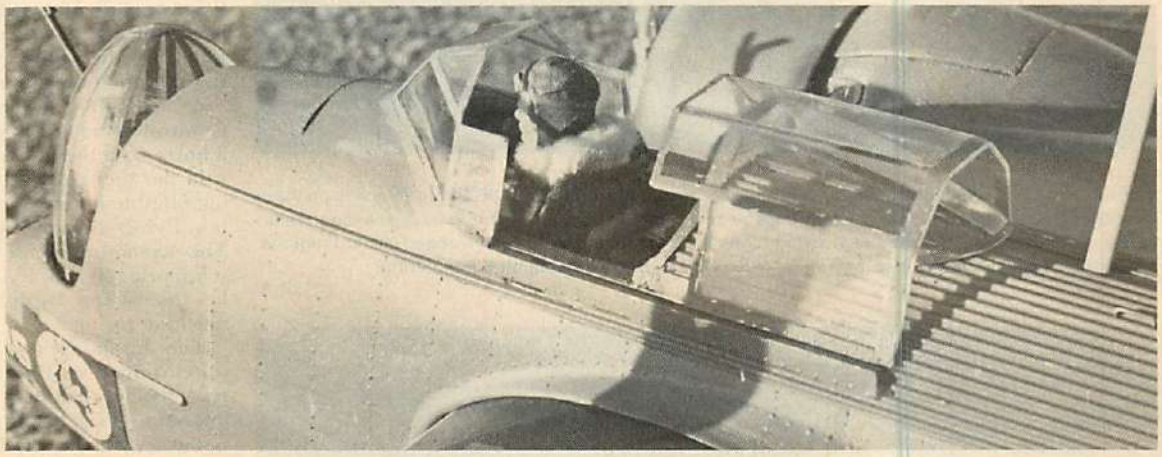
In 1973 I heard that the last Martin B-10 left in the world was donated to the Air Force Museum at Wright Patterson Air Force Base in Dayton, Ohio, I felt that this was a great opportunity to get the information and pictures needed to build my B-10. I asked my good friend Jerry Puleo to accompany me and off we went to Dayton. I immediately inquired about the B-10 and the receptionist knew nothing about the plane. I asked her if I could speak to somebody in authority and I was fortunate to meet Colonel Bernard Bass, the Director of the museum. When I explained my dilemma, he told me that the B-10 was on the restricted side of the field and he would take us to the aircraft and let us measure and photograph the plane. Completing this chore with Jerry's help, Colonel Bass was again kind enough to lead me to the archives and I got into the B-10 files. I was able to borrow approximately thirty photographs for reference purposes and from this information was able to start my engineering of the ship at one inch to the foot.

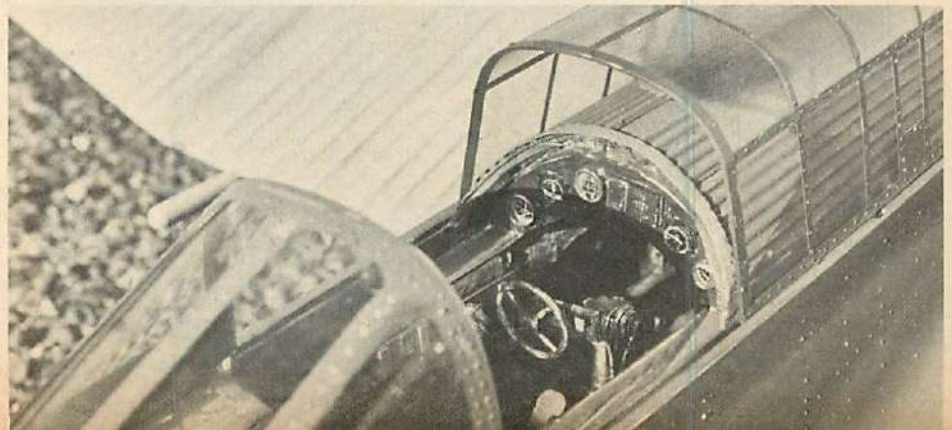
It took approximately one year to make the drawings. I had made blueprints of everything, including the three bladed props. All the metal parts were machined in my shop and cowlings, tail cone, bubble turret and canopys were made from cherrywood into male masters. I then vacuum formed the lucite components.

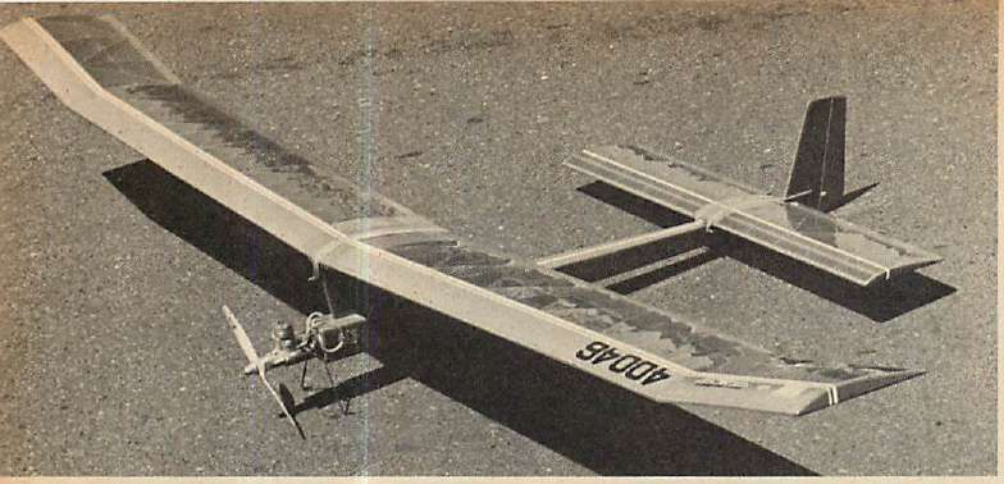
After four years and over 3000 hours my Martin B-10 was complete with a 72" wing, 46" fuselage and weighing in at 9½ pounds loaded.

On June 10, 1977, I was honored to have the plane accepted into the National Air and Space Museum at the Smithsonian Institution in Washington, D.C.; truly a dream come true—ARNOLD RATTNER


HANGAR 30
146





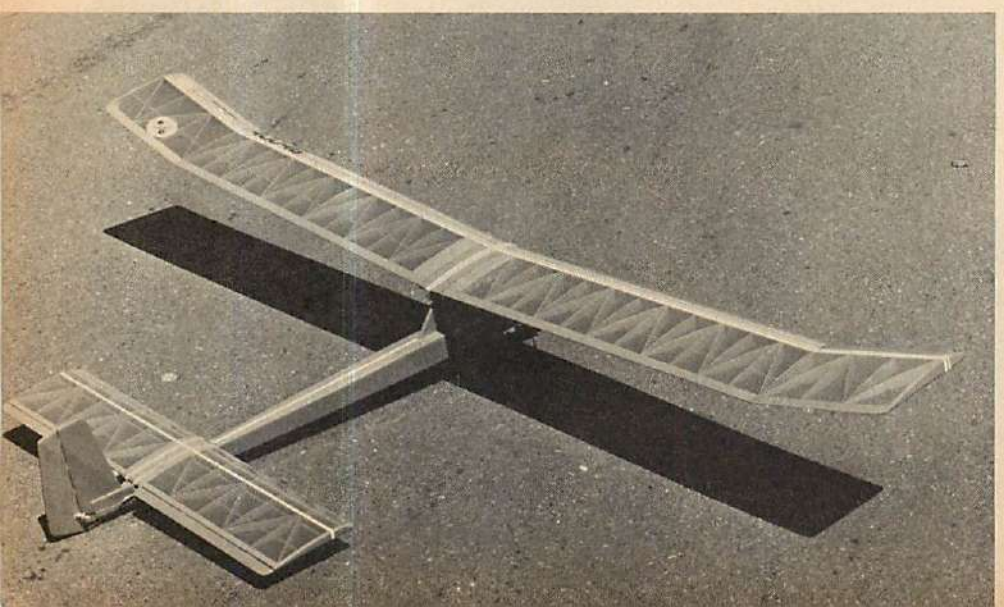


PHOTOGRAPHY: DICK SARPOLUS

Hungry Eagle for R/C

It goes straight up. An unlikely bird that's not exactly F/F or R/C either. Blame it on **Dick Sarpolus**

It sure looks like a Free-Flight, but it isn't. 96" in span, designed around a hot .40. Photo selection on these two pages tells the tale pretty well, a fully capable fast climbing thermal machine with just enough radio buried within to guide it in after a satisfying flight. It's a practical way to fly in wooded eastern regions. The model features a warp resistant wing structure, a typical competition F/F planform.



To get a few things straight, 1. This is not a Free-Flight model; it is a fully Radio Controlled model. 2. I am not at all suggesting that Free-Flighers use radio control equipment in any manner. 3. I am suggesting that flying this type of R/C model is exciting, fun, challenging and there may be a good case for some sort of radio controlled power duration event.

I built this model for my own amazement and enjoyment, and have really been enjoying its performance. Free-Flight has always been a fascinating part of our hobby to me, and the screaming climb followed by the floating glide of a well trimmed model is a beautiful sight to see. Equally exciting is being able to control every part of a model's flight to the best of our ability with today's excellent radio equipment. I wanted a Radio Controlled model which would climb up in a hurry, and then be able to search out and ride the thermals. This resulting model is not eligible for any sort of existing competition flying - which makes it a sport model. The screaming climb behind the urge of a schnuerle .40 coupled with a floating glide has made the Hungry Eagle a real fun machine for me.

The design approach obviously is based on current Free-Flight technology, with a few changes to tailor it for Radio Controlled operation. First test flights showed this was not as easy as it would appear; the far rearward balance point suitable for a Free-Flight model's circling glide is not suitable for R/C flying, where we want to search out thermals and actively pilot the aircraft about. Trial-and-error testing showed that getting the balance point far enough forward resulted in a good flying, easily controlled aircraft.

Design-wise, we picked an eight foot wingspan as a size allowing use of 36" stock and a one-piece wing which will fit without much trouble in our car. Three foot main panels, one foot tip panels, and an 11" chord give a wing area of 1056 square inches. Spruce spars and balsa webbing for an I-beam structure give adequate strength

along with thin 1/16" ribs for light weight. The stabilizer is similar, multiple spar construction, 36" span and 324 square inches area for 30% of the wing area. A flat bottom airfoil gives good penetration and soaring ability. A long fuselage of minimum cross-section was decided upon for stability and minimum bulk. Fuselage construction is simply balsa sheet with plywood doublers for strength where needed. The pylon wing mounting is probably not needed for strictly Radio Controlled operation, but was used for traditional appearance. No landing gear as such; landing skids only. We planned on vertical attitude hand launching with an adequate powerplant; a hot pylon racing schnuerle .40 seemed a good size. Not being hampered by any rules, I usually set the timer for about a 25 second engine run for a good long flight.

Mechanically, the engine was simply radially mounted on the nose. A 1½ ounce fuel tank was made; the engine uses a crankcase tap for pressure fuel feed. Engine run timing is done with a Tatone cut-off timer, although a friend is building this model to be fitted with a 3-channel radio installation and a throttled engine for fun flying. I'm sure it could be flown with an engine much smaller than a .40, but we wanted that vertical climb performance. The radio access hatch is on the bottom of the fuselage; nylon tubing pushrods are used back to the elevator and rudder, and the radio receiver antenna is inserted into a nylon tube installed back through the fuselage.

I am surprised that we don't have some sort of R/C power duration competition - Old Timer R/C is of course very popular but that event emphasizes Free-Flight style performance and of course precludes original, modern design effort. Perhaps we will see such an event in the future; if it appeals to you, try a Hungry Eagle for some fun.

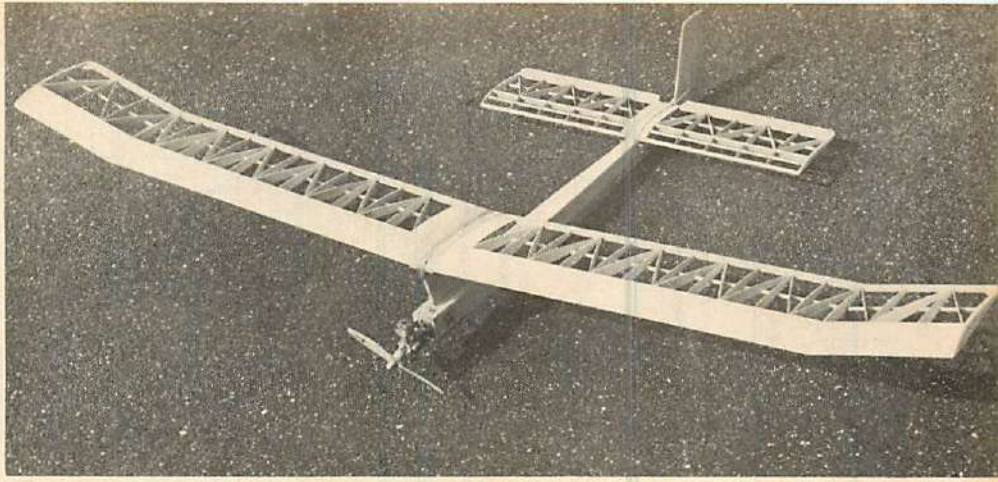
Flying technique is basic; a circling climb is not necessary, we just point it up and keep it going straightaway. When the engine cuts, a quick noseover and turn to prevent a stall, and we can begin searching for lift. The plane penetrates quite well and has been flown in strong wind conditions. The wing is strong; we have done a number of loops in the glide with no problems.

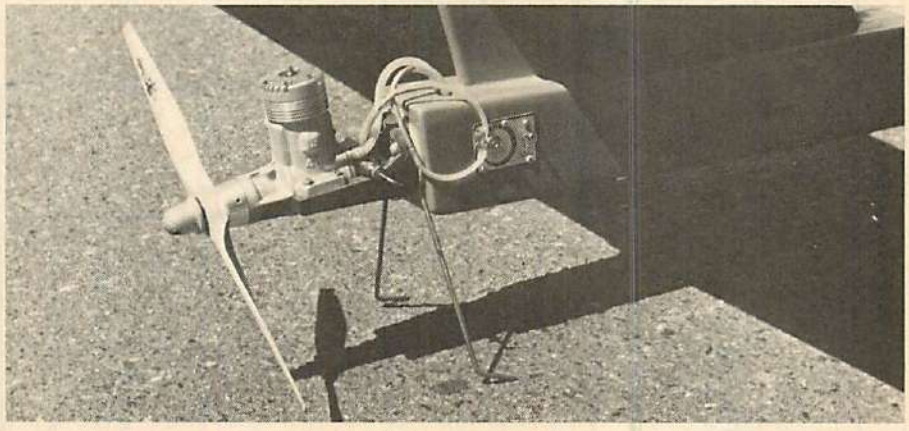
Construction Notes

This can be brief, as the model is so easy to build. The Hungry Eagle was built in one week, after having first cut out all the parts. Making a ready-to-build kit saves construction time.

Let's start with the wing first. It's a flat bottom design makes for easy building. Starting with the bottom spars, the ribs, leading and trailing edges are glued in place. Vertical grain spar webbing is added next, followed by the top spar and leading edge planking. Leave the spar webbing out where the plywood dihedral braces will be added. Join the tip panels to the main panels, then the center dihedral joint, which is reinforced with epoxy and fiberglass cloth. Wingtips are simply rounded-off ¼" balsa. No wash-out or wash-in is used. The horizontal stabilizer is built just about like the wing, but with the added elevator.

The fuselage is next. A pylon was built first, over the plans. Fuselage sides are long, so locate the splices over the plywood doubler or add small 1/32" plywood doublers, location depending on available wood lengths. Nose section 1/32" plywood doublers

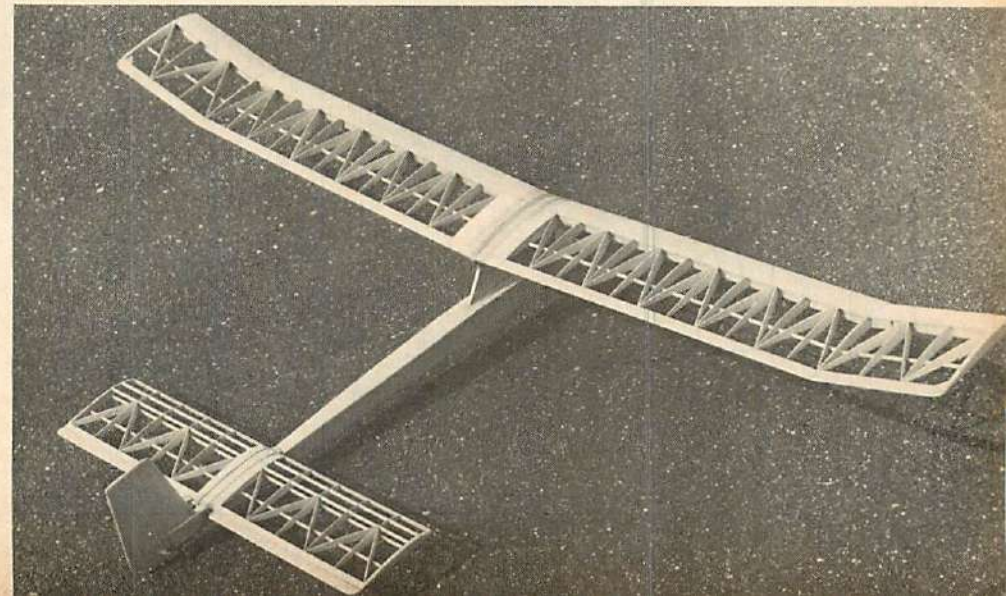


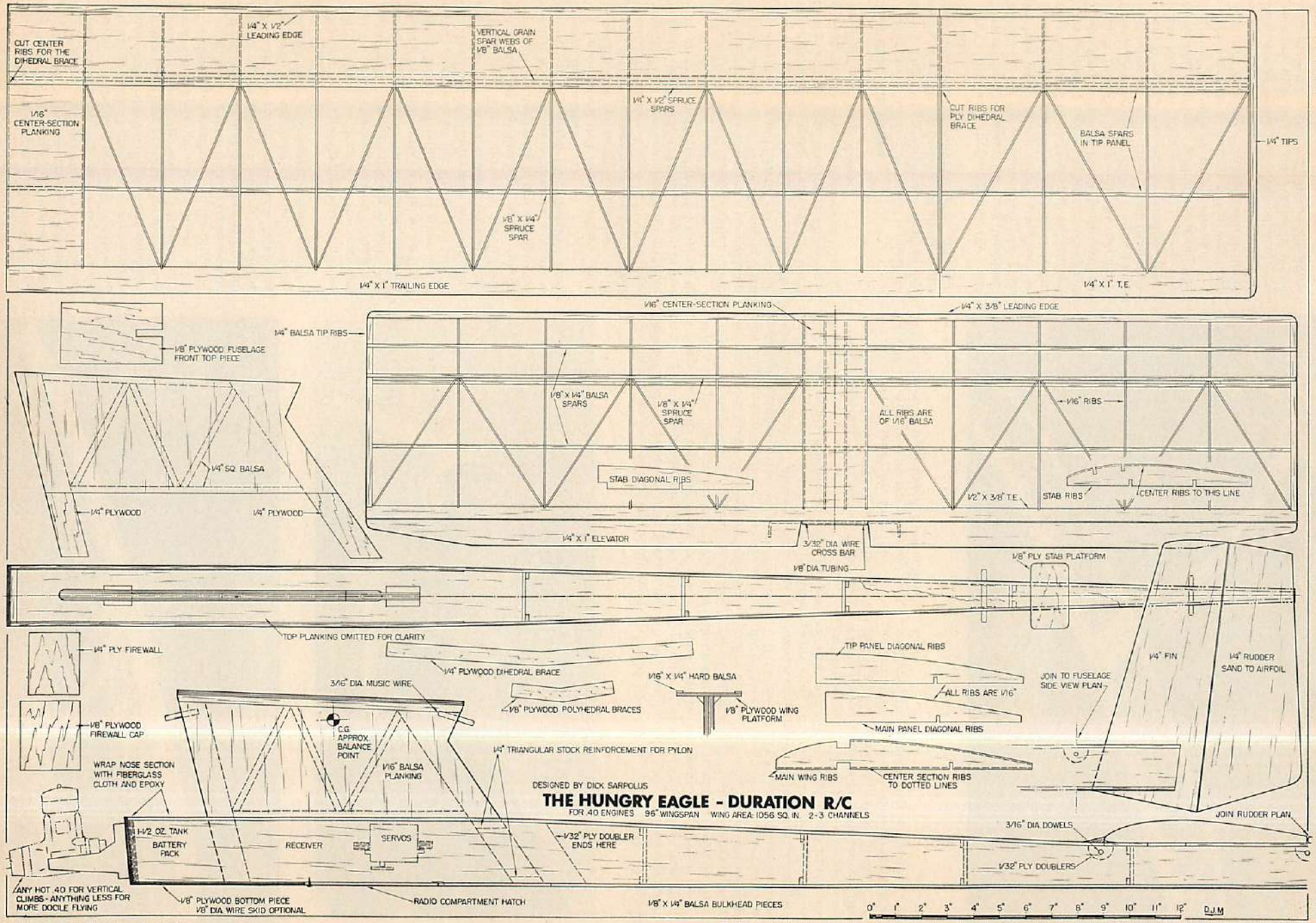


are epoxied to the sides. The ¼" plywood firewall and ⅛" plywood nose pieces are used to join the fuselage sides, and the pylon is added, with its reinforcements to lock it solidly into the fuselage. The tail can now be pulled together and the top planking added. Before closing up the fuselage with the bottom planking, install the nylon tube pushrods and another nylon tube for the receiver antenna. A ⅛" plywood nose cap is added and the nose section wrapped with light fiberglass cloth and epoxied for strength.

Detail finishing calls for a Tatone fuel cut-off timer, landing skids, mounting rails for the servos, holes for fuel lines, etc. MonoKote was used on the wing and stab, and the fuselage was painted. Rudder throw should be considerable, while elevator travel can be minimal. The balance point location as shown on the plans has given good results; we would expect each model to need individual trimming to suit the flyer. Slow response to the rudder and a mushing, rather than a floating glide would indicate the balance point should be farther forward.

If the idea of an R/C power duration event sounds good to you, write to FLYING MODELS with your comments and/or suggestions. Perhaps we will see a follow-up article, discussing in more detail such a competitive event. If you fly sailplanes, with a model like this you won't need a winch or hi-start; it is noisy but the noise only lasts 20 seconds or so. Happy flying and watch out for a Hungry Eagle!





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flying models

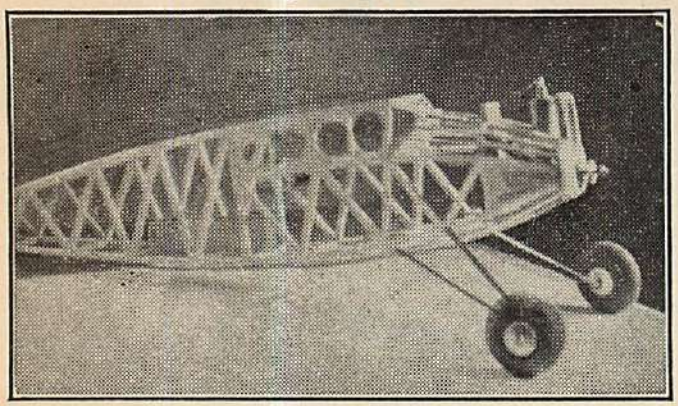
50

FLYING ACES

Fifty years is a long time, but that's how long *Flying Aces* and it's offspring FLYING MODELS have been around publishing reams of information on airplanes, model and otherwise. Both model airplanes and FLYING MODELS have come a long way since 1928 and as part of our 50th anniversary celebration we thought that you might like to see how things were. To this end we decided to reprint selected articles from the pages of *Flying Aces*. Most of the pieces will be construction articles on ships that are suitable for use in either Old Timer or Antique competition. Rubber will not be forgotten, nor will engines. We even hope to get in a World War I fiction piece or two. For any of the construction articles that we reprint, there will be full size plans which are exact copies of the original available through Carstens Flying Plans. We will also endeavor to reprint something from the *Flying Aces* News of the Modelers column which reported the results of contests of the day along with occasional early photographs of folks who are still very active in the hobby.

The first design that we picked comes from the May 1939 issue of *Flying Aces*. Its called "Scrappy" and was designed by a fellow named Ray Heit. Pictured above is the cover of that issue. As you read through the article and the picture captions, remember that they are exactly as they were 40 years ago and we hope that you enjoy reading them as much as we do. Don't miss any of the next years' worth of FLYING MODELS because we'll be reprinting these articles once every month. One more thing—watch for our special 50th anniversary issue, it's sure to be a collectors item.

One quick glance at this photo is all you need to tell that "Scrappy" has got "it." For this "skeleton" shot of Ray Heit's petrol buggy clearly shows that the model was designed for Streamlining, Stamina, and Speed—all with capital "S's"!



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A NIFTY FIVE-FOOT SHIP

Once again, Ace Modeler Ray Heit, has designed a gas buggy that's really a honey. This five-footer is not only simple to build, but it also boasts a unique cowling that makes for easy engine accessibility! So get your tools together, look over the bill of materials, and get set to—

✪ ✪ ✪

Make a "Scrappy" Gas Job

By Ray Heit

HERE SHE IS, fellows! Just the happy-go-lucky type of model you have always wished for. Yep, *Scrappy* was designed primarily for service, durability, and stability. She has many noteworthy features combined to produce a model capable of great results. And to give you an idea of how efficient a flyer *Scrappy* is, she led us a swell chase and turned in a four minute flight with only a thirty-second motor run at a recent contest.

Scrappy is well stressed and will give you supreme service, even after hard handling. Although designed for any motor of the one-fifth horsepower variety, the model has been flown with less than one-tenth horsepower! However, for best results it is advisable to use the former motor—one fifth horsepower.

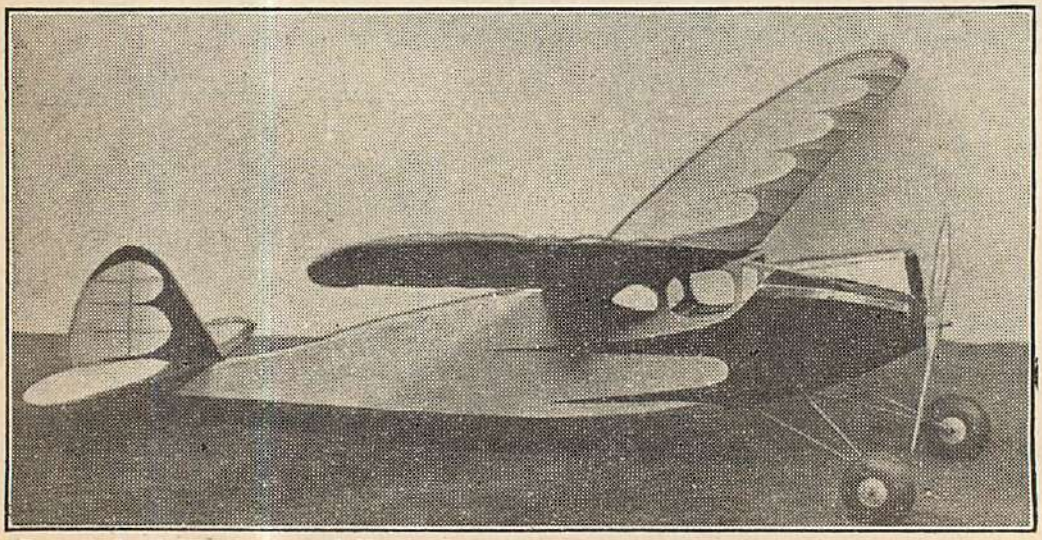
One of the ship's best features is a sleek, unique motor cowling. It permits the power plant to be entirely enclosed. And yet, with a flip of your wrist, the motor is laid bare for examination or operation! One might say it is a "dream cowling" for it aids immensely in streamlining, combines *everything* that could be wished for in a model builder's dream!

To construct this *Scrappy* gas job lay out all parts of the plane, full size, by enlarging from the assembly drawing, making use of all the dimensions as given. (See plans for scale.)

Begin the model by first constructing the fuselage. Build two side frames from one-quarter inch square medium balsa. Use hard balsa for all longerons and braces. Lay out the longerons in a jig composed of wire-head nails alternately spaced at the maximum bends of the longerons. Glue all upright members and braces in. But do not be stingy with your cement—remember, you want a *strong* model.

After assembling one side of the fuselage, let it dry for a few hours before repeating your operations to produce the other half. After the two halves are finished, assemble them by cementing the two tail-posts together, then work toward the nose by filling in the cross members at their proper positions.

Using Plate 3, which shows the different formers and ribs, trace the formers required for the fuselage onto balsa sheet—including the firewall which is cut from one-quarter inch plywood. Glue the formers in place. But before attaching the stringers, it is advisable to fasten the landing gear wire in place by wrapping the wires to the fuselage with thread. Then coat the thread generously with cement. After the landing gear has been completed, the stringers will fit into the slots provided for them in the formers.



Boy, oh boy! What a beaut! You're dern tootin' she is! Ray, now studying aeronautical engineering, wrapped all of his experience as a modeler builder into his job, too. Yep, everything from a simple, wide tread landing gear to a corking paint job. What's more, "Scrappy's" a cinch to build and a pleasure to fly!

Motor Mount

MAKE the motor mount from one-half inch dural angle material. Rivet the pieces together with three-sixteenth-head rivets. And bolt the motor mount to the firewall. Then make two straps long enough to accommodate the placing of the coil against the firewall. Bolt the coil in

Bill of Materials

(All wood is medium balsa except where otherwise specified)

Six strips ¼" by ¼" by 4' hard balsa for longerons;
One sheet ⅛" by 2" by 18" for formers;
Five strips ⅛" by ¼" by 36" hard balsa for stringers;
One sheet 6" by 6" by ¼" plywood for firewall;
Four sheets 1/16" by 2" by 36" for wing ribs;
Three strips ¼" by ½" by 36" for main spar;
Three strips ¼" by ⅛" by 36" for auxiliary spar;
Three strips ½" by 1/16" by 36" for trailing edge;
Three strips ¼" by ¼" by 36" for leading edge;
One strip 4' by 3/16" by ¼" reed for wing tips;
Six strips ⅛" by ½" by 36" for tail ribs and spars;
Two strips 3/16" by 3/16" by 18" for leading edge;
One strip ⅛" by 2" by 18" for trailing edge;
Four sheets of bamboo paper, six feet of ⅛" landing gear wire, ½ pint of glue, 1½ feet of dural angle, and celluloid for cockpit covering.

place. Finally, make the battery-box as shown on the plan. Cement and pin in place permanently directly under the center of gravity.

Now cut the pattern of the cowling out of aluminum and bend the end over for the hinge. Push the two prongs of the hinge into former "A." It is not advisable, incidentally, to cover the fuselage before placing the motor upon its bearers.

Wing Construction

THE WING is very simple to construct so pay close heed to the following instructions in order to produce an exact replica in the easiest manner:

Cut the ribs out as a whole by having them pinned together during the carving. Sand them as one unit. Slot the ribs carefully for spars, leading and trailing edges. This slot will automatically line up the wing if cut correctly.

Splice the main spar as shown on the plans, but be *sure* to include the necessary five inches of dihedral. Lay one half of the spar down on the plan and glue the ribs for half a wing panel in place. Cement the auxiliary spar in the spot provided for it in the ribs.

Attach the leading and trailing edges, trim the three tip ribs to size, and bend the reed edge around them. To form the other wing panel, lay the other half of the spar down on the plan and proceed with the same operation.

After the two wing halves have been completed, insert your center section ribs—two in number—to the spar and fill in with the leading edge, trailing edge, and auxiliary spar. (To make the model stronger, you might try covering the center section of *Scrappy's* neat wing with sheet balsa.) Glue the gussets for the wing tips in place so that the reed will not warp.

Tail Assembly

BOTH the rudder and stabilizer are constructed in the same manner—so we'll describe the construction in general of both.

Lay the one-eighth by one-half inch spar on the plan. Cut out the trailing edge and tip from one-eighth sheet. Pin the tail units to the plan. Then pin the leading edge in place. Now, it is necessary to raise the leading and trailing edges slightly off the plan in order to place the ribs in their exact center. Raise the leading edge about thirty-five seconds of an inch off the plan and lift the trailing edge approximately three-sixteenths of an inch.

Cut the ribs out as rectangular pieces and cement them between the spar and the leading and trailing edges.

After completing these operations, the tail sections should be left to dry for several hours. After they have set thoroughly, sand the ribs to a symmetrical shape with heavy sandpaper. Finish off with light paper.

Covering

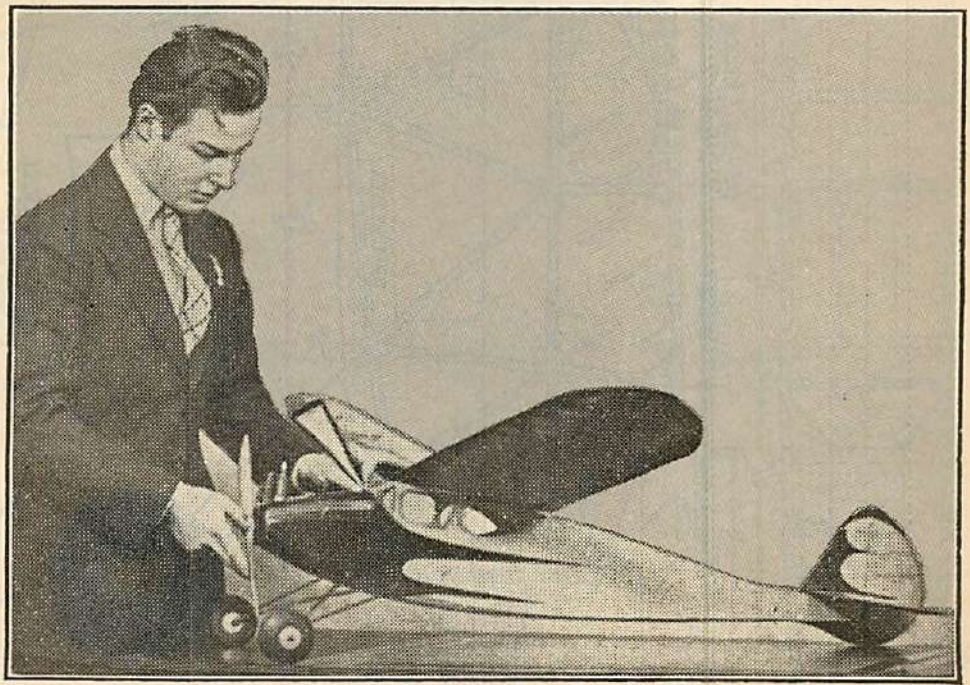
EITHER SILK or bamboo paper may be used for covering. However, bamboo paper will produce a much lighter model and is therefore preferable. If you have not had any previous experience with either of these two materials, it is advisable to start your covering with the rudder and stabilizer. The tail surfaces are fairly simple to cover because of their flat surfaces.

Dope is usually a bit too thin for attaching the covering, but a half-and-half mixture of heavy cement and dope is easy to work with and it holds the covering in place admirably. Spray the entire plane with at least two coats of water. After it has dried thoroughly, apply two coats of dope.

There is one precaution, however, that you should observe in the wing covering, and that is—glue the covering material to each under part of the wing *thoroughly*. This will produce the under camber of the rib in its required form and will make for much better flying qualities in your finished model.

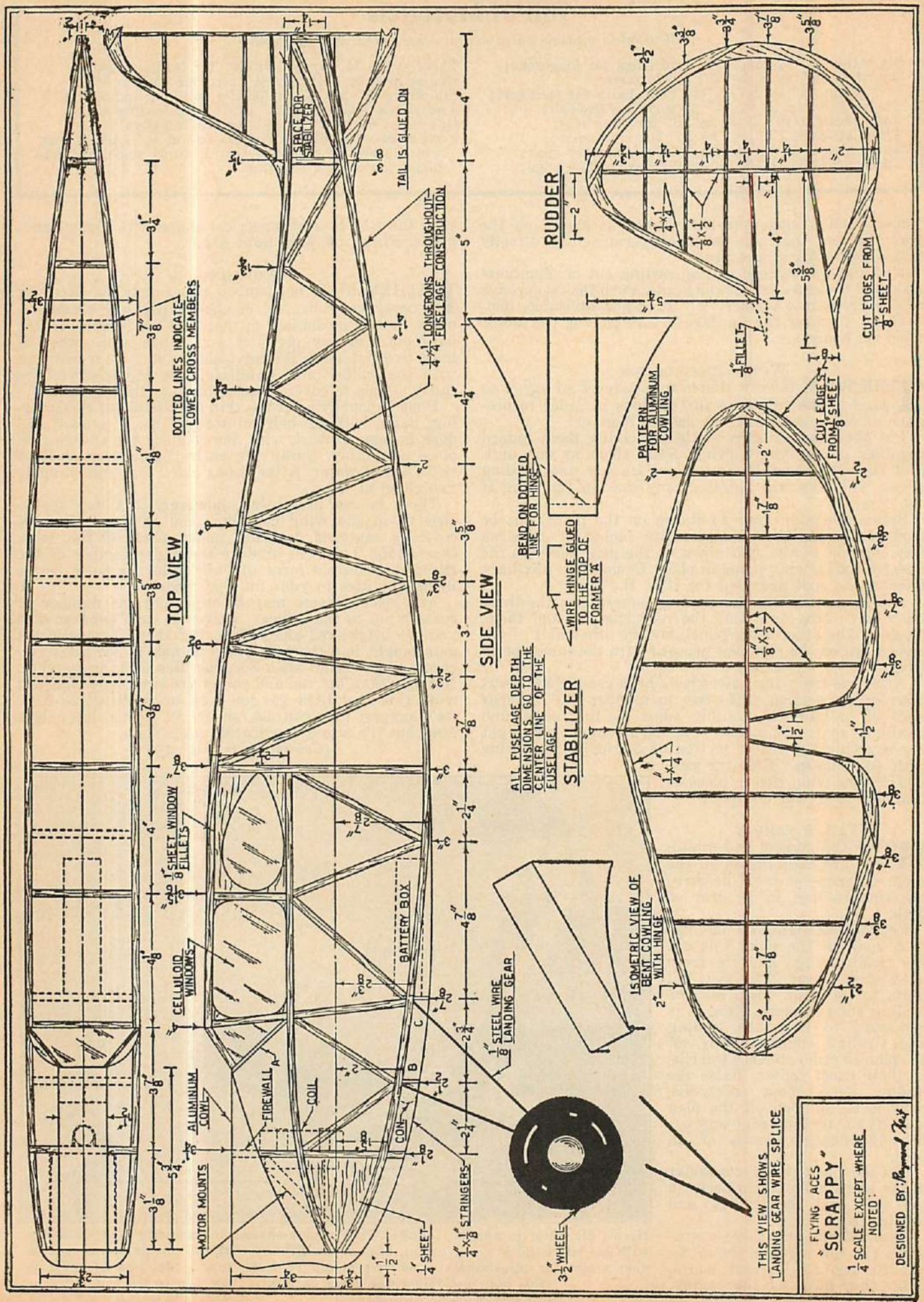
Any color scheme may be used and the number of coats is up to the builder. However, we'd suggest that you use bright red and yellow. For then, if your model gets caught in a thermal, you'll be able to see these two colors much easier when *Scrappy* flies into the distance. Not only that, but red and yellow are two colors that will make this sleek little gas job even *more* attractive. Yep, we'd suggest that you use 'em by all means. It's only a hint, but it's also a worthwhile suggestion.

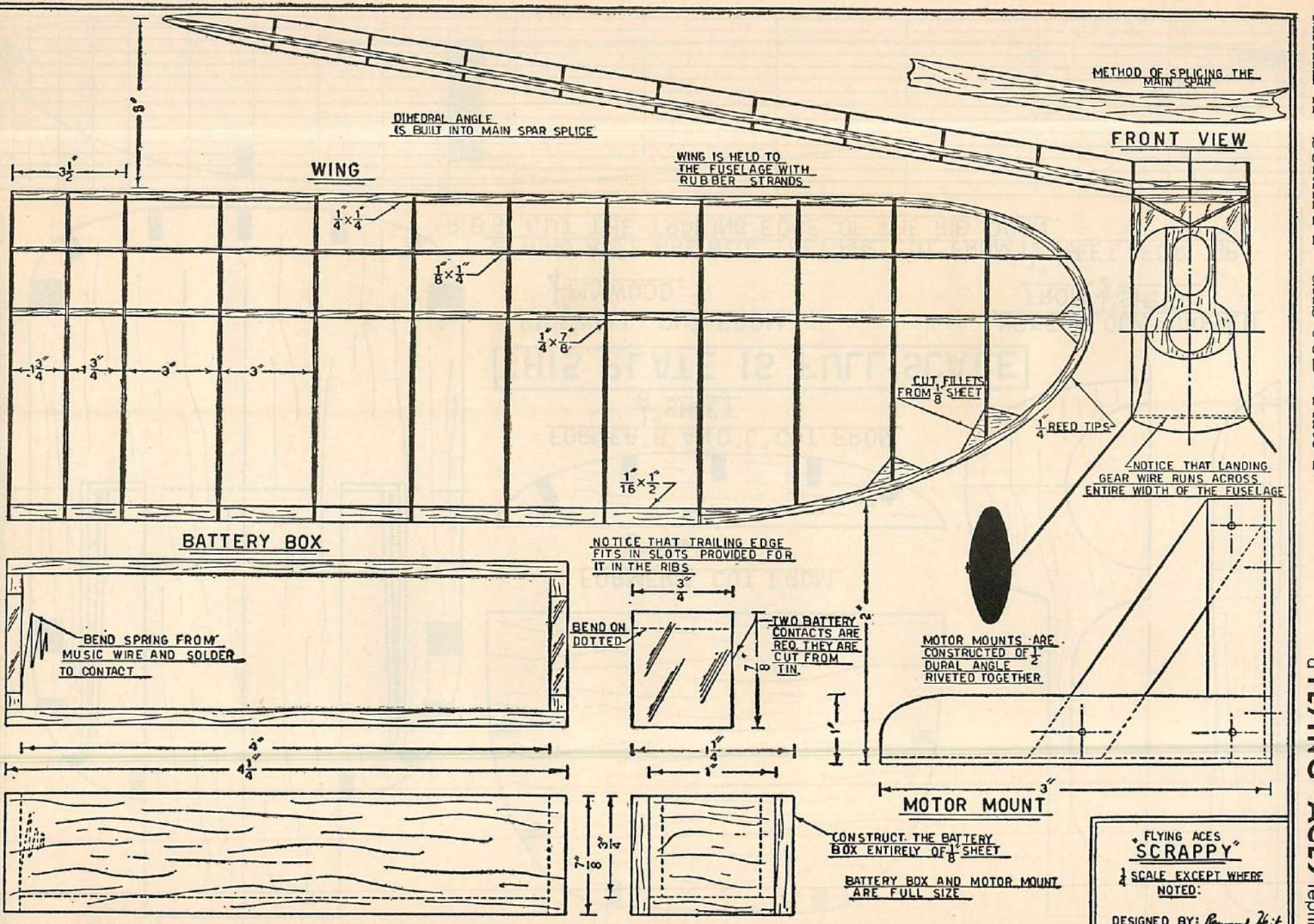
(Continued on page 49)



Here's Mr. Heit in pusson, fellows! That wedge-shaped thingamajig Ray's holding with his left hand is a convenient, hinged cowling top that will enable you to get to your motor for adjustments in no time at all. To make your model just as swell as this one, just follow the plans carefully. Now hop to it!

MAKE A "SCRAPPY" GAS JOB—Plate 1




METHOD OF SPLICING THE MAIN SPAR
DIHEDRAL ANGLE IS BUILT INTO MAIN SPAR SPLICE
FRONT VIEW
WING
WING IS HELD TO THE FUSELAGE WITH RUBBER STRANDS
8"
3½"
1/4 x 1/4
1/8 x 1/4
1/4 x 7/8
1 3/4
1 3/4
3"
3"
CUT FILLETS FROM 1/8 SHEET
1/4 REED TIPS
1/16 x 1/2
NOTICE THAT LANDING GEAR WIRE RUNS ACROSS ENTIRE WIDTH OF THE FUSELAGE
BATTERY BOX
NOTICE THAT TRAILING EDGE FITS IN SLOTS PROVIDED FOR IT IN THE RIBS
3/4
BEND SPRING FROM MUSIC WIRE AND SOLDER TO CONTACT
BEND ON DOTTED
TWO BATTERY CONTACTS ARE REQ. THEY ARE CUT FROM TIN.
2"
7/8
1"
4"
4 1/4"
1/4
1"
MOTOR MOUNTS ARE CONSTRUCTED OF 1/2" DURAL ANGLE RIVETED TOGETHER
3"
MOTOR MOUNT
7/8"
3 3/4"
CONSTRUCT THE BATTERY BOX ENTIRELY OF 1/8" SHEET
BATTERY BOX AND MOTOR MOUNT ARE FULL SIZE
FLYING ACES
"SCRAPPY"
1/4 SCALE EXCEPT WHERE NOTED:
DESIGNED BY: Raymond Hoit

FORMER "A" CUT FROM 1/8" SHEET
FORMER "B" AND "C" CUT FROM 1/8" SHEET
THIS PLATE IS FULL SCALE
NOSE BLOCK CARVED FROM 1/2" SHEET
FIREWALL CUT FROM 1/4" PLYWOOD
21 WING RIBS ARE REQ. THEY ARE CUT FROM 1/16" SHEET. FOR TIP RIBS, CUT THE TRAILING EDGE OF THE RIB DOWN.

a FLYING ACES reprint

News of the Modelers

M.M.A.C. Gas Results

WITH an entry list of more than 100, the New York City Metropolitan Model Airplane Council held its first NAA sanctioned outdoor gas model meet of 1939 on February 12 at Creedmore Field, Long Island.

The large-motor event drew the most entries and after preliminary test flights it soon developed into a duel between Sal Taibi, of the Sky-Scrapers Club, and "Trail Blazer" Henry Struck, of the Queens Model Airplane Club. Struck, flying a ship of his own design—a six-footer with inverted motor and single wheel landing gear—got off first to a flight 3 min., 18 sec. Taibi launched his seven-footer a few moments later and it turned in 3 min., 29 sec.

On the second flight, Struck's craft did 5 min., 4 sec.,—but unfortunately was washed out for the day after landing in a tree. Taibi's second flight, the longest of the afternoon, was timed at 6 min., 4 sec.

Due to unfavorable wind conditions, few flyers completed three flights. John Tourville, of the Kee Wee Club, had three flights with his Heath Monarch. His longest flight was 3 min., 5 sec., and his total time of 4 min., 19 sec., gave him third place. Other prize winners in the large-motor event were Magnus Anderson, Tony Bocchi, Edward Beshar, Frank Leghorn, Irving Pearlman, and G. Grathwhol.

Joe Raspante, of the Majestic Model Club, took first place in the small-motor event with a total time of 4 min., 48 sec. J. F. Condon, of the Kresge Aero Club, of Newark, took second place with a total flight time of 2 min., 17 sec. Gilbert Rose placed third; Leon Shulman, fourth; and Phil Sagona's ship took fifth.

As first prize winner, Sal Taibi received a Council Trophy and a $5.00 cash voucher donated by Beshar Models. Hank Struck, popular F.A. Model author, was presented with a special M.M.A.C. Trophy and a $2.50 voucher. The other place winners were also awarded prizes.

According to Irwin S. Polk, President of the M.M.A.C. and director of the tourney, the wind conditions prevented the ships from making their best showing during the meet.

Nearly every club in the Greater New York area which is associated with M.M.A.C. was represented at the contest. The Council has made tentative plans for additional meets in the near future.

New Jersey Meet Announced

NEW JERSEY'S first state-wide rubber meet will be held on May 30 opposite the General Motors plant on route 25 in Linden, N. J. The jousts will see Senior class "C" fuselage models, stick jobs, and class "B" hand-launched gliders in action. There will also be a Junior event, in which featherweight models will be eligible.

The meet will be sanctioned by the NAA. Entry is by mail only. The entrance fee will be 25c for the Senior event and 10c for the Junior event. Entry blanks may be obtained from the Linden Model Aircraft Club, Old City Hall, Linden, N. J. The contest will be open for out-of-state builders as well as New Jersey residents.

"Wings" for S.M.A.C.

UNDER the new NAA membership program, the Syracuse Model Airplane Club has opened its membership to district and neighborhood groups of model builders in and around Syracuse, N.Y. In this manner, several local Wings of the S.M.A.C. will be formed.

These Wings will elect their own officers, consisting of a Captain and a Secretary, whose respective duties will include representation in Club activities and recording of the various aero work.

Each Wing will conduct its own regular weekly meetings for the purpose of model building, instruction, and discussions. Business meetings of the senior advisory committee, together with the officers of the local Wings, will be held once a month at Headquarters.

The S.M.A.C. urges every model maker in the vicinity of Syracuse to contact Headquarters and get tips on joining or organizing a Wing.

Make a "Scrappy" Gas Job

(Continued from page 45)

Test Flying

DO NOT attempt to fly the plane before balancing it with the motor and ignition equipment installed. Glide the model from about a four foot height. If *Scrappy* shows a tendency to stall, you can adjust this condition by shifting the position of the battery box slightly forward. And if the model glides too steeply, move the battery box toward the rear until the best results are obtained.

When *Scrappy* is ready for her first power flight, give the ignition a final check-up. Have your motor running smoothly, and set the timer or gas supply for about 15 or 20 seconds.

With the engine's throttle set at about the half way mark, release the ship and run alongside of it. Correct any turning tendencies by a slight touch on the wing tip. And after the model gains flying speed, *Scrappy* will do the rest under her own power. Yep, even at this reduced power, *Scrappy* will show you the peppiest little bit of flying your eyes have ever witnessed outside of the local flying field.

And, above all things, *don't forget that timer!* Because if you lose the ship on her first flight, we don't want to have to say: "We told you so!"

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Act of August 12, 1970; Section 3685. Title 39. United States Code)

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Elizabeth R. Dickson, Circulation Manager

With Model Builders

by Ed Whalley

Hot Stove League; Some Things To Think About

Whoever becomes NMPRA president this year, we, in this area, are going to have to take a hard look at how we are going to keep things going. The apathy towards racing shown by the majority of the members of NCRCC is prevalent in other clubs as well. I haven't been to a race all year at which I haven't heard the call for help and responded by timing, doing the matrix, or something. Something has got to be done to encourage workers as well as racers. Perhaps we need a Miniature Pylon Workers Association . . . well trained people, willing to travel . . . and put on a race a month during the season. The MPRWA would set the fees and put the profits in their treasury.

"Another thing we should look at is getting the sport recognized as a sport—rather than as just a hobby. Good publicity for our races would help . . . we should stop aiming all of our publicity at the hobby magazines and get some of it to Sports Illustrated, etc. It's time we grew out of our shell. We have lots of time between now and next season to do something about better organized and better publicized events. We may even get paying sponsors."

—Bee Williams
in Northeast Racing News

• Re. the Scale Situation: "For whatever the reasons that may have produced the present situation, I agree with Bill Boss that 'each facet of Scale is still not adequately represented.' But what to do about it?

"Bill suggests abolishing the present Scale CB organization and replacing it with three 'Advisory Committees,' one each for R/C, C/L, and F/F. These would report to their respective contest boards with the results of their votes being binding. . . I applaud Bill's intent, but question the proposal. Suddenly, instead of only 11 men within AMA . . . we have 33 . . . And will 33 committeemen do the job better? . . . Bill's use of the term 'advisory committee' seems a misnomer as they would, indeed, make the rules—not just offer advice . . . My feeling is that specialized input is needed by the Scale Contest Board, but that it should come from non-AMA groups . . . So my answer to Bill Boss's proposal is just this:

"Let's give the existing Scale Board a

chance to do its job . . . Then, let's back it up with needed input from appropriate societies made up of dedicated, knowledgeable Scale modelers from each of three fields of Scale competition: Free-Flight, Controline, and R/C."

—Bob Clemens, NFFS Digest

• "It is highly unlikely that there will be a single Controline special-interest group (similar to Free Flight's NFFS) established in 1978. Such an organization would have the authority to designate a once-a-year AAAA 'national championships event' for Controline as authorized in the AMA Rule Book . . . Winston-Salem was required to get an endorsement from each of the present C/L special-interest groups before it was granted AAAA status for 1977 by the Executive Council. Because of the time involved . . . there was no chance to take advantage of the publicity that such a 'national championships event' should enjoy.

"I hereby propose that the Controline Contest Board be given the official authority to designate the location that will be given the AAAA sanction for 1978 (and possibly future years) and that the CLCB's decision will be final and not require approval by the Executive Council. The selection shall be made by a vote of the members of the CLCB; and, if the choice is between only two possibilities, the one receiving the simple majority shall be chosen; or, if more than two locations are being considered, a choice will be made by the number preference system in the Contest Board Procedures."

—Bill Pardue, CD, 1977 AAAA U.S. Control Line Champs

• "After every World Champs with up to 40 in the flyoff for each event, there is an uproar over limiting performance more so that there is no flyoff. The way I see it is that, with the caliber of flyers at the WC level, there simply has to be lousy conditions to eliminate maxouts. But, I wonder, should we modify the rules with the World Champs in mind; or should we consider the guys like me who seldom maxout anyway but who simply like the events and are trying to improve? Limit the performance more through rules changes, and watch the average guy desert the sinking ship. Remember, it takes a large number of entries to support the teams financially and to support the manufacturers who make the engines, timers, towhooks, etc., that make the World Champs possible. It takes numbers as well as fanatics. We have to entice new blood into the program to give us future teams. I believe that the World Championships is the ultimate contest and that flyoffs should be expected and planned for. There are hundreds of other contests each year featuring the FAI classes, and the rules should keep those contests and their entrants well in mind. Without them there would be no World Champs required; so go slow on FAI rules changes."

—Steve Helmick, Batsheet

Second SNIRT's a Success

We promised quite a while ago to let you in on what took place out at West Baden in the Northwest Institute's famous Atrium. But we got sort of hungup—that is, Bud Tenny got hungup at a computer conference, and we missed a few months of Indoor News and Views. However, this month the ol' mailman brought us the paper and John Martin gave us the good word. It was quite a meet.

John CD'd the meet, and he ought to know; so, we're going to let him tell it: "There we all were," he says, "some of the world's best hot-shot Indoor modelers in the process of setting six AMA records and one world record. Then along comes this little eleven-year-old kid whose dad plunks down two-bits for a one-day Junior membership, see? So, three guesses who wins the first-place cup for the best index of performance flying? Right! The little kid (Mike Van Gorder), and he more than *doubled* the national records for Pennyplane and Novice Pennyplane. (His time was 9:31.4).

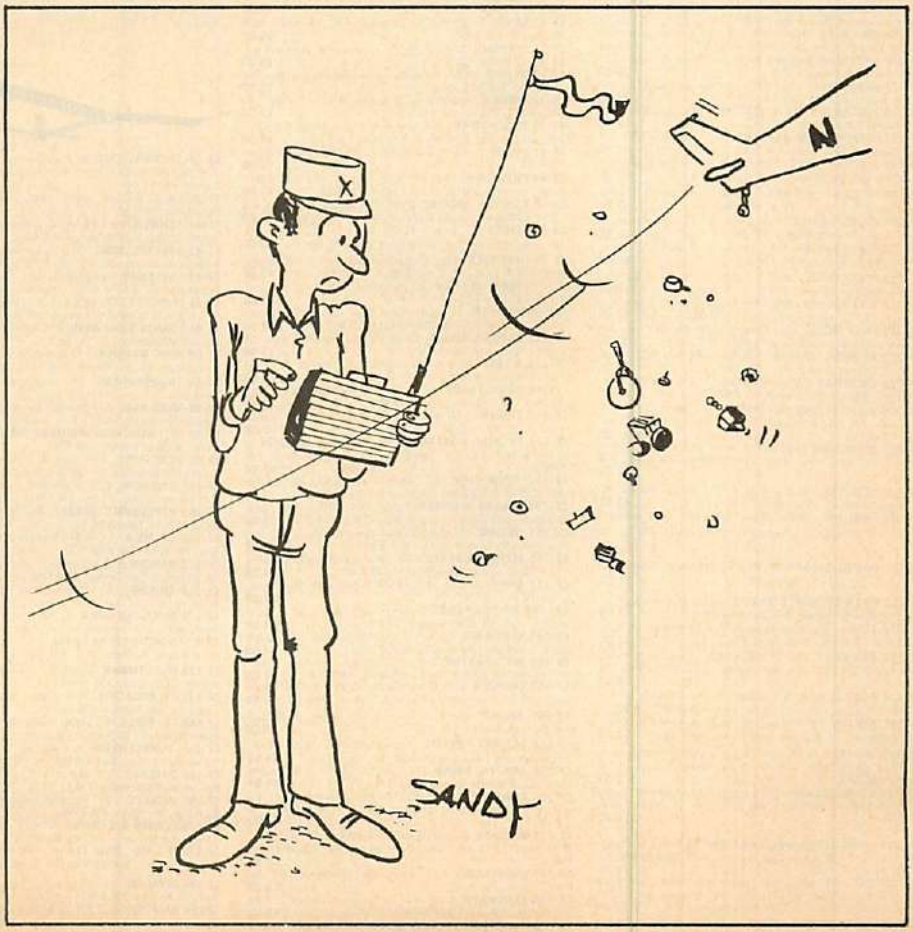
"Bucky Servaites set two records with a single flight of his hand-launched Stick model. One was a new FAI Cat. III world record, and the other was the AMA Cat. II Stick record—both with a magnificent 35:08 flight. Richard Whitten who won last year was second *and* third this year. He set two new records: one in Pennyplane (10:03); and, one in ROG Stick (15:59.4). The latter model type is rarely seen—a tiny, peanut-sized ROG model—but there were a lot of them at the SNIRT. I suppose that by the time Richard leaves the Senior age group he will have most of the Indoor records. He still has a year to go.

"The most exciting moment of the Trials came when Ron Ganser broke Col. Bob Randolph's long-standing ROG Cabin record. (If it can be said that Indoor is exciting at all—some claim that it is as exciting as watching an offshore yacht race. Some yachting buffs claim this is exciting, too. Let's face it, Indoor isn't for everyone.) Ron hung both his Cabin models but managed to piece together one whole plane from the remains. He took a short test hop with this hybrid; then went for broke. It flew like silk. Near the 22-minute mark, the model was still up 30 feet, and it looked like the record would be broken; so all flying ceased. Flyers kept coming over to make the already nervous Ganser even worse. He looked like a man with a 150 bowling average who was working on the twelfth strike of a perfect game. As the model landed at 25:19, a rousing cheer rose from the usually phlegmatic group. This roused Dick Doig who wanted to know what the excitement was (he'd slept through the flight). When told of the flight that had taken place 'at the other end,' he grumped 'Where is the "other end" of a round building?' Indoor flyers put up with a lot.

"Stan Chilton dominated the Easy-B field which is becoming more like Hard-B every year. Stan had more hardware than the first moon shot just to put a ⅔ gram model up in the air for almost 17 minutes. (16:42.6) Fifth place in Easy-B was 13:51.4 which would have won last year. Manhattan Cabin—in just one year—has bloomed. Any time over 4:00 was super—last year; but now you'd better do twice that. Jim Miller did 8:14.5 to beat Chuck Obarski's 7:09. This event has not, as yet, evolved a stereotyped winning planform, and many different design concepts were visible.

"A couple of months ago in Model Aviation, Bob Meuser presented a Novice Pennyplane design called No-Non-Cents. Bob admittedly knows nothing at all about Indoor. Wouldn't you know that this was the model young Mike Van Gorder used to win the NIMAS meet and set two new Junior records; oh, irony!"

Just in case you're still wondering, Sam, SNIRT stands for Second NIMAS International Record Trials. They are the greatest. Other winners included: Roy White, Pen-



Carstens plans

R/C SCALE

CF-9 AERONCA CHAMP. 51" wing. .049 to .09 engine. Familiar sports design. $3.00

CF-13 NORTH AMERICAN P-51 MUSTANG. .099 powered single R/C or UC. By Bob Buragas $3.00

CF-17 B-25 MITCHELL BOMBER. Dandy World War 2 vintage bomber for R/C. By Nick Ziroli. FM 12-70 $5.00

CF-36 LOCKHEED U-2. Prop or glider spy plane. 72" wing. Semi-scale. By Robert Trishin. FM 2-66 $3.50

CF-51 ALPAVAIA RF-3. French sportplane. 63" span. .09 mil. By O. Kampen. FM 9-66. R/C $2.00

CF-52 CURTISS JN4D JENNY. 42" wing, for single channel R/C. By Nick Ziroli. FM 9-66 $1.50

CF-53 AVI 205. Argentinian sportplane. 44" wing. R/C or rubber, scale. FM 9-66 $3.00

CF-57 SPAD SV-2. World War I fighter. By Paul Falanek. FM 5-64. .09 mil. 43" span. R/C $3.50

CF-64 GYPSY MOTH, DEHAVILLAND. 68" wing. 60-71 biplane. 3 sheets. By Elmer Nowac. R/C FM 4-67 $4.00

CF-66 WACO N. Tricycle gear biplane. .09-.15 R/C with 40" span. FM 1-67. By Nick Ziroli $2.00

CF-81 FOKKER D-VII. 60" span R/C World War 1 biplane. 1/8 th scale. 61 mil. Nick Ziroli. FM 6-67 $3.00

CF-83 GRUMMAN AG-CAT. Duster biplane. 1/12th scale for .35-.40 CL. 2 shts. By Bob Adair. FM 6-67 $3.00

CF-85 BEECHCRAFT STAGGERWING. 52" span biplane for 60 R/C. Bryce Petersen. FM 7-67 $3.00

CF-89 FAIRCHILD PT-19. Low wing Army trainer 62" span for .49 R/C. Gene Rogers. FM 8-67 $4.50

CF-93 FOKKER DR-1. WWI triplane for .53-.61, 48" wing. R/C. Bryce Petersen. FM 9-67 $4.00

CF-97 MORANE SAULNIER "N". 1915 version, near-scale. 55" span. 35. Nick Ziroli. FM 10-67 $3.00

CF-104 S.E. 5. Famed British WWI fighter biplane. 52-1/2" span. 61 mil engine. FM 1-68. By Nick Ziroli. R/C. $3.50

CF-109 FALK RIVETS. Goodyear Racer. 1st at '67 NATS. FM 2-68. By Joe Foster. R/C $3.50

CF-114 EINDECKER E-111. German monoplane. 55" span, uses .35. Nick Ziroli. FM 3-68. R/C $3.00

CF-122 EL BRONCO. R/C sport tail dragger for .61 mil with 68" span. By Wally Zober. FM 9-70 $3.00

CF-126 HEATH BABY BULLET. 1928 racer by founder of Heath Co. 56" span R/C for .46 to .60. Nick Ziroli. FM 7-68 $3.00

CF-143 VIGILANTE. Semi-scale R/C similar to Navy AJ-3. 51" span with .45 to .60 pusher. Nick Ziroli. FM 11-68 $3.00

CF-146 AMERICAN EAGLE. 1929 scale biplane R/C. For .40-.56 mil. 56" span. By Tom Collins. FM 12-68 $3.00

CF-154 P-47 THUNDERBOLT. Near scale WW II fighter with .45 engine. R/C. By Nick Ziroli. FM 3-69 $3.50

CF-159 JUNKERS CL-1. 56" span World War I model with Enya .45 engine. By Jim Burgholzer. FM 5-69 $3.50

CF-163 FW-190-A3. Near scale R/C, retractable gear. 54" span. 45-.56 engine. Nick Ziroli. FM 6-69 $3.50

CF-170 MARTIN MARAUDER B-26. R/C twin .45 scale 22" wing. By Joe D'Amico. FM 8-69 $5.00

CF-173 DEMOISELLE. Dumont's pioneer airplane 3"=1' scale. Zundel & Signorino. RC. FM 1-70 $7.00

CF-174 BLACKBURN A.L. STEEL. 1915 near scale R/C for .29 mil. By Vern Zundel. FM 9-69 $5.00

CF-183 GRUMMAN F8F BEARCAT. 52" span R/C, .40-.52. Semi-scale by Nick Ziroli. FM 2-70 $3.50

CF-184 INSTANT AZTEC. Twin Super Tigre .29s power VK Cherokee R/C conversion. B. Petersen. FM 2-70 $3.00

CF-188 MORANE SAULNIER. 1/6 scale model of French sportplane. 57" span, 49. Ziroli. FM 3-70 $3.50

CF-200 VOLKSPLANE. 57" span R/C for .45, popular home build craft. By Gene Rogers. FM 7-70 $3.50

CF-215-DEPERDUSSIN. 1911 vintage craft with 56" span. R/C scale. By Vern Zundel. FM 10-70 $5.00

CF-223 PFALZ D-111a. R/C 2" scale World War I biplane. .60 mil. By Alan Spievak. FM 6-71. 3 sheets $10.00

CF-227 A.V. ROE BIPLANE. 1911 standoff 2" scale R/C for 19. 35, 60" span. By Frank Noll. FM 7-71 $7.00

CF-245 TIGER MOTH. Slow flying oldtime bipe for .23 mil, inverted with 43" span. Don Foster. FM 11-71 $2.00

CF-251 NESMITH COUGAR. Eyeball scale R/C 54" span, .40-.60. Simple. Stan Hines. FM 2-72 $5.00

CF-273 GRUMMAN F4F-4 WILDCAT. RC semi-scale, 45" span. OS Wankel .30. Nick Ziroli. FM 9-72 $3.50

CF-285 B-17G FLYING FORTRESS. Four Webra .20. R/C 1st in '72 NATS flight achievement. Tom Cook. FM 1-73 $7.00

CF-287 WINDECKER EAGLE. R/C scale 69" span, 61 Webra, Kraft radio and retract gear. Ralph Jackson. FM 2-73 $7.00

CF-308 SKYHAWK. Navy Douglas R/C semi-scale A4-D5. 39" span. .40-.60. Stan Hines. FM 9-73 $3.50

CF-311 BUHL BULL PUP. Classic R/C Semi-scale with 76" span, 4-ch radio, .60 engine. Vern Zundel. FM 10-73 $7.00

CF-313 BOEING-STEARMAN PT-17. Stand-off scale R/C for .40 to .60. Nick Ziroli. FM 11-73 $3.50

CF-319 PIPER CHEROKEE ARROW. Scale R/C of popular sport design. 60" span. Don Condon. FM 1-74 $3.50

CF-321 TAUBE. Stand off scale R/C with 84" span German WWI. 2 sheets. Nick Ziroli. FM 1-74 $7.00

CF-324 GRUMMAN F6F-3 "HELLCAT." Stand Off Scale R/C for Enya .60 and .59" span. Don Williams. FM 2-74 $4.00

CF-326 BRISTOL M1B. World War I stand-off scale monoplane. 52" span with .40 engine. Tony Eck. FM 3-74 $3.50

CF-328 CULVER "V". Stand-Off Scale post War classic. 51" span. 29-.35 engines. Stan Hines. FM 4-74 $3.50

CF-331 MOONEY M-18. 69" span stand off scale R/C for Fox Falcon .60 with Goldberg Retract Gears. Stan Hines. FM 5-74 $3.50

CF-333 HENRI FARMAN. 1910 antique stand off R/C scale ship for .40-.45 mil .2" scale. 47" span. 3 sheets. Vern Zundel $10.00

CF-334 1920 DAYTON-WRIGHT RACER. ½A Pylon or Stand-Off Scale R/C. 30" span Cox Tee Dee .049. By Bob Aberle. FM 6-74 $2.50

CF-339 BARLING NB-3. 33" span Stand-Off Scale open cockpit monoplane for .010 to .020 engines or rubber power, pulse radio or F/F. Hurst G. Bowers. FM 7-74 $2.00

CF-341 HANRIOT HD 1. WWI R/C Scale biplane. 56" span for Ross Twin or .40 to .60 engine. Tony Eck. FM 8-74 $3.50

CF-348 AERONCA L Stand-Off Scale R/C with 72" span for .45 to .60 engine. Bruce Lund. FM 10-74 $5.00

CF-349 HIPERBIPE. R/C Stand-Off Scale. 45" span for .40 engine. Stan Hines. FM 11-74 $3.50

CF-350 CURTISS ROBIN. R/C Scale monoplane. 61½" span. .45 engine. Bill Antoine. FM 11-74 $5.00

CF-357 STUKA JU-87 Stand-Off Scale R/C for .60 engine. 64" span. Tony Eck. FM 1-75 $3.50

CF-364 EAA HEADWIND. Brilliant stand-off scale R/C for .15 engines. 48" span. by M. Wolsky. FM 4-75 $2.50

CF-373 LINCOLN SPORT. .020 powered 30" span scale classic for pulse/light R/C or F/F. Hurst G. Bowers. FM 6-75 $2.00

CF-375 FOCKE WULF 190D-9 Stand-Off Scale R/C, 62" span, for .60 engines. Tony Eck. FM 7-75 $6.00

CF-377 YAK-9 R/C Stand-Off Scale for .60 engines, 61" span. Dan Reiss. FM 8-75 $3.50

CF-386 GRUMMAN SKYROCKET Stand-Off Scale R/C twin-engine experimental. 56" span and two .29-.40 engines. Nick Ziroli. FM 10-75 $3.50

CF-380 BD-6 Stand-Off Scale R/C for .19 to .35 engines. 56" span. Bob Aberle. FM 9-75 $3.50

CF-389 HEINKEL He-162 Stand-Off Scale R/C with 55" span for Scozzi .40 Turb-Ax 1 ducted fan. Nick Ziroli. FM 11-75 $5.00

CF-391 SOPWITH PUP Stand-Off Scale R/C WWI biplane with 59" span, .60 engine. Jerry Puleo. FM 12-75 $5.00

CF-396 DEWOITINE D-510 Stand-Off Scale R/C with 69" span. .40-.60 engine. Alan Spievack. FM 2-76 $3.50

CF-397 JUNGSTER II Stand-Off Scale R/C EAA Homebuilt with 50" span. .19-.29 engine. Al Wolsky. FM 2-76 $3.50

CF-400 HAWKER HURRICANE Mk-1 R/C Scale with 61" span for Ross .61 engine. Tony Eck. FM 3-76 $5.00

CF-403 P40 "WARHAWK." R/C Stand-Off Scale, 56" span, .60 engine. Dan Reiss. FM 4-76 $3.00

CL-40b BOULTON PAUL "DEFIANT. R/C Stand-Off Scale fighter. .60 engine, 60" span. Dan Reiss. FM 5-76 $3.50

CF-407 BIG "GERE SPORT." .60 powered 54" span Stand-Off Scale R/C biplane. Dr. J. Makovich. FM 6-76 $3.50

CF-413 FARMAN 400 MONOPLANE .020 powered light R/C or F/F. 38" span. Hurst G. Bowers. FM 8-76 $2.00

CF-418 MONOCOUPE 90A Stand-Off Scale R/C classic with 72" span for .45 engine. Frank Dellamura. FM 9-76 $6.00

CF-425 DEWOITINE D-520 R/C Stand-Off Scale WWII fighter for .60 engine. 62" span. Dan Reiss. FM 12-76 $3.50

CF-431 GRUMMAN KITTEN G-63 48" span R/C Stand-Off Scale ship for .40 engines. Bob Aberle. FM 2-77 $3.50

CF-434 NAKAJIMA KI-84-1a HAYATE 54" span Stand-Off Scale R/C for .60 engines. C.S. Hines. FM 377 . . . $3.50

CF-441 BERG O. AVIATIK D-I Austrian WWI SOS R/C Bipe with 40" span for .35 to .40's. Frank Dellamura. FM 6-77 $3.50

CF-446 FOKKER T-2 Stand-Off Scale R/C with 66-inch wingspan for .40 to .60 engines. Don Martin. FM 7-77 $3.50

RADIO CONTROL

CF-158 BOONDOCK BIRD. R/C trainer with 52" span for .15-.19 and Hallco gear. McGovern. FM 4-69 $3.00

CF-2 RAVEN. 54" RC ship with fat fuselage, holds PREY glider releasable in flight. Single channel RC .09-.19. By Don McGovern. FM 4-65 $3.00

CF-4 FAIRFIELDER. Low wing R/C design. 67" span. .45 R/C. Phil Ostilio. 2 sheets. FM 2-62 $5.00

CF-5 CITATION. Multi R/C by John Roth. 63" span. .35-.45. High wing, fast assembly. FM 8-62 $5.00

CF-7 RIDGE HAWK. Proportional R/C trainer. Fun ship. 72" span. .19-.35 power. John Tudor. FM 8-63 $5.00

CF-11 RIDGEHOPPER. .15-.19 high wing. 58" span Trike gear. R/C Single. FM 10-62 $5.00

CF-12 GENIE. Single R/C fat fuselage with 59" span. Don McGovern. FM 2-64 $5.00

CF-21 SKYLINER. Class III R/C. 45 shoulder wing design. By Marty Meyer. FM 9-65 $5.00

CF-22 TEMPO. Class III multi winner. 68" wing. By Phil D'Ostilio. FM 6-65 $3.50

CF-32 MARK 8. Class 3 multi design R/C. 67" wing. .60 engine. By Paul Foster. FM 4-66 $3.00

CF-35 TOUCHDOWN. R/C low wing sport model for small fields. 42" wing. .049. By B. Petersen. FM 4-66 $2.50

CF-42 LUCKY 2. Class 2 R/C .60 . . . 45. By Gene Rogers. FM 7-66 $3.00

CF-48 PATRIOT II. Low 62" wing class II. .61 mil Bosch airfoil, proportional R/C. Joe Foster. FM 8-66 $3.00

CF-50 B.I.R.D.S. SPECIAL. Class III R/C. .60 mil. Uses any standard foam wing. By Dallas Moran. FM 10-65 $3.00

CF-54 KOBRA II. Class II RC hi-stab with 60" wing. .29-.35 competition model. Gene Rogers. FM 10-66 $3.00

CF-72 DEFENDER. Class II parasol wing. 65" Removable tray for R/C gear. 45. Gene Rogers. FM 4-67

CF-77 PIRATE III. Twin tail mid-wing. 60" wing. 45 mil. By Nick Ziroli. FM 5-67 $3.00

CF-100 SKIPPER. 31" span sport flyer for single channel 1/2A and small R/C. By Vince Micchia. FM 12-67 $2.00

CF-105 BANTAM KOBRA. Small proportional R/C with .23 power. By Gene Rogers. FM 1-68 $4.00

CF-110 X-103. Sport & experimental for Hallco R/C .103 gear. Elevators & ailerons. .23 Ziroli. FM 2-68 $3.00

CF-116 DEVASTATOR. 66" span multi-contest with Enya .60 R/C. By Gene Rogers. FM 4-68 $3.00

CF-117 TRIDENT. All weather R/C trainer for .61 Land, water, ski. Wally Zober. FM 4-68 $3.00

CF-134 PROFILE MUSTANG. R/C equipment is buried in foam wing. 45, 56" wing. By Sterling Models. FM 10-68 $3.00

CF-137 TIGER TWIN. 62" span trike geared design for two .23s R/C. By Gene Rogers. FM 10-68 $3.00

CF-138 JUNKER KLUNKER. Put a 45 to .60 in this Zober design. Looks German. World War I. FM 10-68 $3.00

CF-151 URCHIN. Small R/C sport tail-dragger for .23 and minigear. By Gene Rogers. FM 2-69 $2.00

CF-156 VIXEN ACROBATIC. 40" span biplane with inverted .23. R/C design by Gene Rogers. FM 4-69 $4.00

CF-161 SNIPE. R/C sport flyer. 68" span with .56 engine. By Wally Zober. FM 5-69 $3.00

CF-165 BOOMERANG. Big acrobatic Bipe. 58" span. .60-.61 R/C. By Wally Zober. FM 3-67 $4.00

CF-175 VERT-A-GO. Rocket assist R/C VTO with 38" span uses .19 engine. By Nick Ziroli. FM 9-69 $3.00

CF-180 ACCELERATOR. R/C sport design for land or water. 50" span for .19-.29. By Gene Rogers. FM 12-69 $2.00

CF-187 SWINGER. 2. R/C stunt with coupled flaps & elevator, foam 63" span wing. 45. Jack Sheeks. FM 3-70 $3.00

CF-206 RAIDER. 56" span for .40 and larger. MRC Digital. By Jack Sheeks. FM 3-71 $3.00

CF-216 DEE-KAY SPECIAL. Formula II R/C pylon racer. 57" wingspan. Dave Gierke. K&B .40. FM 5-71 $3.50

CF-220 BRAZEN RAVEN. 84" multi pattern R/C Super Tigre .60. 4 sheets. Dave Gierke. FM 5-71 $9.00

CF-229 RAMPANT. Toledo R/C Pattern Class Winner. .60 mil, wing retracts in tandam. 62" Jerry Worth. FM 7-71 $7.00

CF-236 BANSHEE. R/C design for full AMA or FAI patterns. With Webra .61 and Pro-Line gear. By Jim Martin. FM 9-71 $3.50

CF-237 SHOESTRING. 57" semi-scale for Fox .35 mil. By Paul Simons. FM 9-71 $3.50

CF-238 BEHEMOTH. Giant 14" T Tail craft. Takes .29 to .60. By Humphries. FM 9-71 $3.50

CF-239 INDY 500. A maneuvering R/C monster that'll deliver pattern performance. Jack Sheeks' original has 61 Merco and EK Logictrol. FM 10-71 $3.50

CF-249 INTIMIDATOR. RC pattern ship for .60 7-1/2 lbs. By Marty Meyer. FM 1-71 $3.50

CF-252 D.D.T. Sport R/C design easy and cheap. 15-23. Jack Sheeks, Jerry Caldwell. FM 2-72 $2.00

CF-255 XP-400. Formula II and FAI Pylon Racer. 56" span, .40. Dave Gierke. FM 3-72 $3.50

CF-256 SPRINTER. Sport R/C V tail two channel 42" span for .049 to .15. By Gene Rogers. FM 3-72 $2.00

CF-261 ASTEROID. R/C sport, 61" span, K&B .40. Dick Johnson. FM 4-71 $3.50

CF-266 DREAMER. R/C sport biplane with 38-1/2" upper span. 37-1/2" lower, with .40 engine. Don Foster design. FM 6-72 $3.50

CF-269 FAIMEISTER. 65" span R/C pattern ship. .61 powered, retract landing gear. Bob Caplan design. FM 7-72 $5.00

CF-270 ESCAPADE. R/C tail dragger with Goldberg retracts. 60 engine. Gene Rogers. FM 8-72 $3.50

CF-272 JOEY. 64" span R/C .60 engine. Pky and foam construction. Dick Sarpoulus. FM 8-72 $3.50

CF-289 ME-109. ½ midget pylon racer 39½" span. Super Tigre .15 with Blue Max R/C. Jack Sheeks. FM 2-73 $2.50

CF-281 SEA VIXEN. 64" span pattern twin boom for .60 power R/C. Jack Sheeks. FM 11-72 $2.50

CF-282 TYCHO 400. Altimeter equipped R/C trainer with Enya .45. Orbit R/C. span 62". McGovern. FM 12-72 $3.50

CF-293 BLUE FLAME. Open pylon racer R/C. 54" span, 505 sq. in. Super Tigre .40 ABC. Dave Gierke. FM 4-73 $3.50

CF-298 MOONROCK. R/C Pattern Delta with 44" span, 46" length. Enya .45. Lou Cubillos. FM 5-73 $5.00

CF-299 GULL. 66" span R/C sport for easy flying. Fox Eagle .60 and MRC 710 radio. Unusual wing. By Dick Johnson. FM 6-73 $3.50

CF-303 TAILGATER. R/C pattern ship. 63" span. Webra .61. Pro-Line radio. Rom-Air retracts. D.Ostilio. FM 7-73 $3.50

CF-310 NORTHERN EAGLE. R/C Pattern. 58" span. .40-.51 mil. Dave Gierke. FM 9-73 $3.50

CF-345 DESPERADO. R/C flap equipped .60 powered sail plane with 99" span. For Ross Twin-Opposed .60 engine. Gene Rogers. FM 9-74 $5.00

CF-340 LIT SPECIAL. ½A R/C Pylon Racer for Cox Tee-Dee .049 with 31" wingspan. V.A. Calluori. FM 8-74 $2.00

CF-367 "NOTHIN' SPECIAL." ½A R/C V-tailed pylon racer with 27" span. Bob Aberle. FM 5-75 $2.50.

CF-383 FLICON R/C Pattern Trainer using Falcon wing kit .40 to .46 engines. Vince Calouri. FM 9-75 $3.50

CF-405 76 SPECIAL. Quarter Midget R/C trainer with T-tail. 15 engine. 36" span. Bob Aberle. FM 5-76 $3.50

CF-410 CANNONBALL. Micro-size R/C pylon racer for .020 engine and Cannon Tiny R/C. 22" span. Bob Aberle. FM 7-76 $2.00

CF-415 REVISION "A" Single or two channel R/C trainer. .049 engine, 44" span. Howie Applegate. FM 8-76 $2.50

CF-417 SUPER WHIPLASH R/C Sport Pattern ship with 54" span and .40 engine. Dick Sarpolus. FM 9-76 $3.50

CF-420 SUPER SPAD R/C sport bipe with 38" span for .19-.30 engines. Gene Weaver. FM 10-76 $3.50

CF-426 WREN R/C Sport biplane for .15-.19 engines. 38" span. Norman Rosenstock. FM 12-76 $3.50

CF-429 INDT RE-TRAINER Sport R/C with a 50" span for .30 engine. Jack Sheeks. FM 1-77 $2.50

CF-435 CHECKERS 64" span R/C Pattern Trainer for .60 engines. Jarold Schmidt. FM 4-77 $3.50

CF-437 THE BASIC BIPE 48" span R/C Sport Biplane for .60 engines. Dan Reiss. FM 4-77 $3.50

CF-438 REISS' ROOSTER R/C Sport Biplane for .60 engines. Dan Reiss. FM 5-77 $3.50

CF-442 LIL' EAGLET .010 Sport R/C with 22" wingspan for mini radios and Cox .010. Bob Aberle. FM 6-77 $2.00

SAILPLANES

CF-1 SPOTTER. A/2 Nordic with 29" two piece wing. By Joe Bilgo. FM 4-65 $3.00

CF-14 SEAGULL. Giant 84" wingspread soarer R/C with supplementary .09-.15 power. Don McGovern. FM 8-62 $5.00

CF-16 THERMAL QUEEN. Radio control soarer uses Eppler 385 airfoil .144" span with light wing loading. By Carl Lorber. FM 11-70 $3.00

CF-20 LIL' T. R/C 74" glider, rudder only with T tail. By Bob Hahn. FM 6-65 $4.00

CF-34 SCHWEITZER I-26. R/C 1/6 scale glider with 67" sport canopy. By Dan Lutz. FM 4-66 $4.00

CF-41 SPECTRE WING. R/C flying wing. Thermal soarer with power assist. 15-.92. By McGovern. FM 6-66 $2.50

CF-44 CASTAWAY. Nordic A-1. 51" span. Low cost competition glider. By Joe Bilgo. FM 7-66 $2.50

CF-46 SLINGSBY SKYLARK 4. 119" span, high aspect ratio R/C slope or thermal. Ira Achey. FM 8-66 $4.00

CF-65 FOAMIN'S BAT WING. R/C modern foam wing soarer. By Rolf McPherson. 72" span $3.00

CF-69 BONG BOOMER. FAI R/C glider, one time world record altitude holder. Maynard Hill. 136". FM 7-67 $4.00

CF-70 THUNDERHEAD. 54" span towline trainer. By Don McGovern. $1.25

CF-88 SOAR SAM. A/1 Nordic for NATS, etc. 48" span. By Bill Dunwoody. FM 7-67 $2.00

CF-92 1931 NORTHRUP PRIMARY TRAINER. 72" span R/C glider. By Walt Kessler. FM 8-67 $3.00

CF-99 PEREGRINE. 89" span A/2 Nordic with fibreglass fishing rod tuselage. By Ken Whiting. FM 10-67 $2.00

CF-101 RAINBOW. 100" span R/C power & boom design with power assist. 15 mil. FM 12-67. McGovern $3.50

CF-102 HYPODERMIC NERDEL. A/2 Nordic with 47" span. By D. Mathis. FM 12-67 $3.00

CF-108 LA MILA. 66 NATS winner. Hand launched. By Maj. Mel Allen. FM 2-68 $1.25

CF-112 DANCER R/C Glider, pod and boom, V-tail soarer for thermals. Carl Lorber. FM 3-68 $4.00

CF-118 ENILWOT. A/1 Nordic easy to build with underslung rudder. By Dick Mathis. FM 4-68 $1.25

CF-120 AMERICAN CROW. A/2 Nordic. 72" wing. Different approach to competition model. Mathis. FM 5-68 $2.00

CF-127 NORDIC EXTRA LARGE. 113" span. Pod with fibreglass boom. By Chet Lanzo. FM 7-68 $3.00

CF-139 MOLLYMAWK. Superstreamlined 108" R/C thermal soarer. Carl Lorber. FM 10-68 $3.00

CF-142 PTERODACTYL. Hand launch lightweight glider. 20" span. By Tom Peadon. FM 11-68 $1.25

CF-148 TRI-BELLE. RC glider, slope, thermal, power. 105" span. By Marley Michaelis. FM 1-69 $3.50

CF-152 TUMBLEWEED. A/2 Nordic. 74" two-piece wing for windy weather. By Dick Mathis. FM 2-69 $2.00

CF-166 GAGGLER. R/C soarer 117" span. Pod and boom design. By Carl Lorber. FM 11-69 $3.00

CF-169 MISKEET. 149" R/C glider with fibreglass fuselage. By Harley Michaelis. FM 7-69 $3.50

CF-176 SCARAB A/2. Nordic FF with 79" span. Fibreglass fishing rod fuselage. By Dick Mathis. FM 10-69 $2.00

CF-179 U.S. KID, ZING, FLASH. Three hand launched 18" gliders by Bays. Mathis. Peadon. Great fun. FM 7-70 $3.00

CF-189 INVADER. 15-35 powered sailplane 73-1/2" wing. By Gene Rogers. FM 4-70 $3.00

CF194 HALF MACH. 120" span thermal or slope soarer. Optional power. R/C By Carl Lorber. FM 5-70 $2.50

CF-201 PRANCER. 12" R/C thermal or slope soarer with fibreglass fuselage. By Carl Lorber. FM 2-71 $4.50

CF-205 HYSTERIA 1000. Class C FF 84". 40. 1000 sq. in. wing area. By Mathis. FM 3-71 $7.00

CF-207 GOB. A/1 Nordic with Jedelsky type construction. By Mel Allen. FM 4-71 $2.00

CF-208 SABRE SOAR. 125" span R/C soarer. Eppler 385 airfoil. By Neil Liptak. FM 4-71 $3.50

CF-209 ATHENA. 80" span Nordic A/2. Glass fuse. Open class winner '66 NATS. Roger Simpson. FM 3-67 $2.00

CF-233 LEAD ZEPPELIN. Sleek A/2 Nordic free flight. 88" span. Tom Hutchinson. FM 8-71 $2.00

CF-243 YANKEE SOAR. 16 ft. span makes it easier to find thermals. Neil Liptak's R/C soarer. FM 10-71 $4.50

CF-244 GAMBIT. A/2 Nordic. Benedek 7457 airfoil, fibreglass rod fuselage. By Kit Bays. FM 11-71 $2.00

CF-250 POACHER. A/2 Nordic FF. 77" span. A beautiful soarer. By Don Chancey. FM 1-72 $2.00

CF-264 THERMAL HOPPER. 120" span FAI R/C sailplane. British design with rudder, elevator, spoilers/towhook controls. Geoff Dallimer. FM 6-72 $3.50

CF-275 QUASOAR. R/C soarer with 146" wingspan. By Neil Liptak. FM 9-72 $6.00

CF-276 SPIRIT OF FREEDOM. Graceful 118" radio controlled soarer. Harvey Michaelis. FM 10-72 $3.50

CF-280 ILLUSION. 120" span R/C wing soarer for towline, winch, slope. Hal Cover. FM 11-72 $5.00

CF-292 BANZAI. Giant 50" span catapult glider by Mike Atwood. Free flight. FM 3-73 $3.50

CF-306 UNDERDOG. Handlaunch glider design by Harry Kruse. 19" span. FM 8-73 $1.50

CF-314 THERMUS. Catapult glider. 36" span. Bob Adair. FM 11-73 $1.50

CF-317 LONG ISLANDER. R/C soarer for slope or thermal 100" span. Bob Aberle $3.50

CF-337 WILD BLUE. 100" span slope & thermal soarer that fits into a suitcase. Don McGovern. FM 7-74 $3.50

CF-343 FACE SAVER. Handlaunch Glider for rough wind. 16" span. Larry Kruse. FM 8-74 $2.00

CF-359 "SPORT PRO" 100" span R/C soarer with 605 sq. in. area. Hartley Michaelis. FM 2-75 $3.50

CF-369 "BOMMEL". 114½ R/C soarer with full wing flaps. Peter Keim. FM 5-75 $4.00.

CF-372 THE WEIRD ONE 119" R/C canard soarer by Dick Sarpolus and Arnie Pederson. FM 6-75 $3.50

CF-376 OCHROMA PYRAMIDALE Nordic A/2 with 70" span. Dave Linstrom. FM 8-75 $2.00

CF-379 EYESORE 116" R/C flying wing soarer with .19 power pod. Don McGovern. FM 8-75 $7.50

CF-385 "98.6" R/C soarer with 98.6" wingspan and a normal disposition. Howie Applegate. FM 10-75 $3.50

CF-401 BACKLASH Catapult Glider with 24½" span. Larry Kruse. FM 3-76 $2.00

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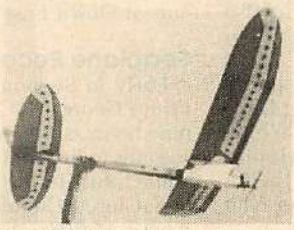

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nyplane, 11:49; Richard Doig, ROG Stick, 15:59.4; Stan Chilton, Paper Stick, 23:14; Al Rohrbaugh, FAI Stick, 29:55; Bob Larsh, HLG, 129.6; and, Roy White, Ornithopter, 2:54.5.

Taibi Takes T-Bugs' Sweeps

The weather gods smiled on Taft during the T-Bugs' annual. The temps hovered around 90 degrees both days, and the winds never came. Unc'l Sal Taibi decided to have a swipe at Sweeps, and he won it—a first for Unc'l Sal. Not that winning is anything new to Sal—he's been on a hot streak all year in addition to his past victories. And when we say "past" we mean PAST. But Sal has been cleaning up at all the annuals this season. Anyhow, get a load of what he did at Taft: three first in ½A (24:01), A (23:40), and Nite (24:25); and, three seconds in B (14:24), C (19:50), and D (9:54). When yer hot, yer hot!

Jim Scarborough was runner-up to Sal Taibi in the Sweeps. Jim, just back from six months in Florida, dusted off a few ships and jumped into the fray. He managed to beat Sal in D by winning with 9:54, but he came second to him in A with 21:26. In Payload, Jim trailed Ed Eliot 5:24 to 7:03. And he came third in Nite behind Taibi and Lee Hunt.

Meet High Time went to Joe Foster and his fast-climbing C ship which managed 38:17. The ship featured automated control surfaces. And young Joey Foster beat a field of experts that included Aker, Quinn, and White to win in Coupe with 9:51. He also took a third in A/1 Junior. Together, father and son are a tough team to beat.

Other winners included: Jim Kelly, B (17:35); Bob Boyer, HLG Open (5:03); Dave Turgeon, HLG Junior (4:52); Bob White, Wake (11:98); Dennis Kramer, A/1 Junior (8:06); Scott Valentine, A/1 Open (15:35); Irv Aker, Mulvihill (28:00); and, Boyer Nite HLG (2:32).

Bob White won the bottle of Scotch in the early-morning Shoot-the-Moon event, a single flight timed from launch to touchdown with 7:52. He used his Unlimited ship for this and managed to beat the gassies. A couple of interested visitors were Kev Brown of England and Peter Lloyd of Australia. Brown and Lloyd flew in Nite Glider (HLG), the former tieing for second with Joey Foster ten seconds behind Boyer.

Maine Meet Draws Well

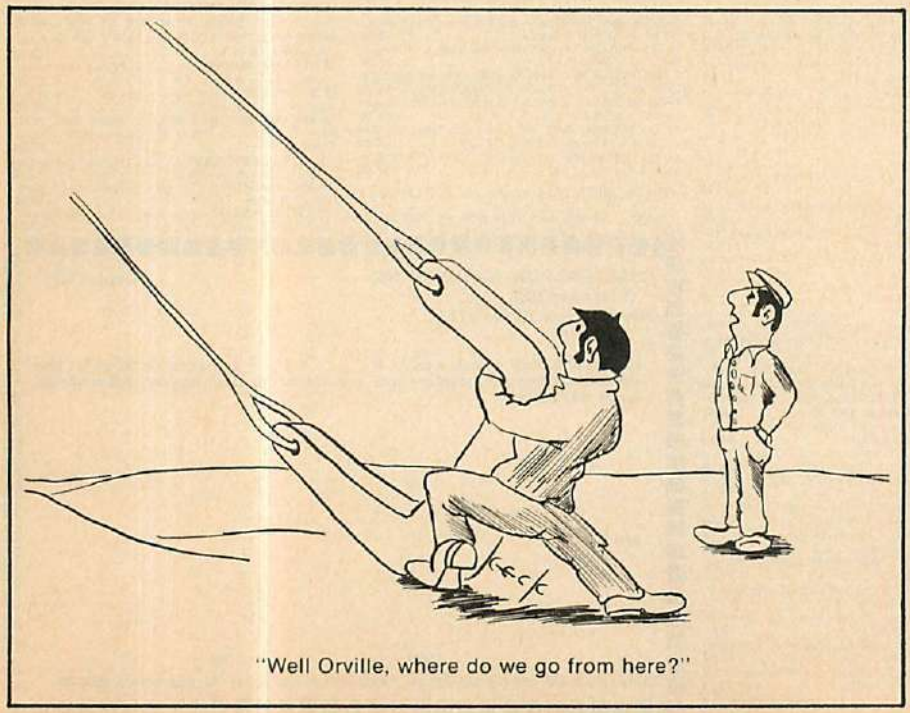
It wasn't exactly the old Mirror Meet, but the State of Maine Controline Meet at the Maine Mall did draw contestants from Quebec down to New Jersey. According to CD George McArthur, the fifty-odd contestants represented the best turnout ever. John Scott traveled 400 miles to judge Stunt along with Joe Griffin, and Cliff Piper literally dropped-in by air to check on this farthest outpost of District One. Claude LeClair did a "tremendous job" as Assistant CD, and so did all of the judges on the various circles.

There were no big winners. A few guys had multiple places: George Higgins, with a second in Advanced Stunt and another in Carrier; John West with thirds in Carrier and Balloon Bust; that's about it. Event winners were: Matt Dube, Stunt Beginner; Paul Coy, Stunt Intermediate; Mike Dube, Stunt Advanced; Neal Thompson, Stunt Expert; Lloyd Seymour, Jr./Sr. Combat; Jim Gall, Open Combat; Dave West, Jr./Sr. Profile Carrier; John Kendrick, Open Profile Carrier; Chris Reidy, Jr./Sr. Ballooning; and, Chuck Turner, Open Ballooning.

Between I-495 and the Maine Turnpike, Maine isn't as far away (in time) as it used to be. We look for even bigger and better turnouts at Down East meets. Right, George?

Seaplane Record Set

Early in September, Dick Weber of the Prince Georges R/C club managed a flight of nine hours, seven minutes and thirty-seven seconds to break his own old record of eight hours, plus. In the process, Dick also set a new Closed Circuit R/C Seaplane distance record of 508 kilometers. Assisting Dick were Luther Jackson, Ken Greenhouse, Lloyd Charles, and Floyd Branch of the PGRC. Walt Good of the DCRC acted as CD, and observers included Glenn Scillian and Bert Belt, also of the DCRC.



"Well Orville, where do we go from here?"

MACA Moves To Finance Pitmen

In a letter being circulated widely, Gary Frost, president of the Miniature Aircraft Combat Association, is asking all contest sponsors to tack-on a one-dollar added charge to entry fees. The extra buck will go toward defraying the expenses of pitmen for the WC's in England next year. The non-funding of pitmen has been the cause of a great deal of anxiety over the Combat Team's chances overseas. Frost also urges that special fund-raising attempts be made during the period to end about June 1st, 1978. All money raised for the pitmen's passage should be sent to Patty Sasnett, MACA Treasurer, at 1443 McKinley Ave., Escondido, Calif. 92027, and the memo should read: FAI Combat Fund. The trip to England will be the first ever made by an official U.S. FAI Combat Team.

According to Frost, the AMA not only has approved the plan but has also agreed to match the money raised on a dollar-for-dollar basis. Good deal!

Notes from the Northwest

• The FAI Free-Flight Semi-Finals were held over Labor Day week end at Harts Lake Prairie, Washington, and brought out a good crowd. Don Zipoy CD'd the meet which was held under variable conditions. The Wakefielders had it warm, breezy, and with occasional showers as they got things rolling on Saturday. On Sunday the A/2 flyers had it cool with winds to 15 mph. On Monday, the Power boys had winds under 5 mph. All told, 255 official flights were logged by a staff of 28 timers.

Apparently, the winds caused some problems with flyaways and resulted in some damage to ships. Nordics were getting off field into the woods. And there were tow problems. Guntis Sietens and Wayne Drake probably had the worst of it in A/2 as they simply ran out of ships before completing their flights. A/2 had 20 entries; Wakefield, 9; Power, 3.

Ron Davis, a member of the Willamette Valley contingent, had a first in A/2 (1310) and a second in Wakefield (1317) and thus qualified for the Finals in both events. His compatriot, Bob Stalick, came fifth with 1061 and also qualified. And so did Bob's son, Ted, who beat his dad by one second with 1062. Marc Nagasawa, considered by many to be the outstanding flyer in the field, was second with 1283, and Jim Thornberry was third with 1142. Zipoy opined that some of the guys had simply forgotten how to handle the wind. Thronberry was the only one to get four maxes; everyone else settled for two or three.

The three Finalists in Wakefield were Bill Langenberg (1339), Davis (1317), and Long John Lenderman (1268). All managed four maxes. Bill's lowest round was 129; Ron and John each dropped to 118.

The three Power entrants were Marty Keith, John Mace, and Clarence Haught. They finished in that order with Marty scoring 1247 via a six-maxes route. Marty thus goes on to the Finals.

According to Don Zipoy, Nordic is rapidly catching on in the Northwest and will be the catalyst which will bring new blood into the International events. He looks for an even bigger Semi's next year.

• Both the Bat Sheet and the Patter reported the untimely, accidental death of Dick Stark, a longtime mainstay of Free-Flight activity in the Northwest. Dick died as the result of a

fall from his hang glider when his harness let go. He was a member of the Kent, Washington, Strat-O-Bats, a former officer of the group, and a CD. The SOB's plan to change the Rubber and Glider meet which he originated to the Dick Stark Memorial. Exit a good guy.

D'Ostilio Takes Scale

The Berkshire R/C Championships in Pittsfield, Mass., drew about fifty entrants. It was a well run meet in one of the best locations imaginable. The site was Pittsfield Airport, and management allowed contestants the full use of one runway. Sport Scale was flown between rounds in Pattern, an arrangement which kept things interesting and proved convenient to all. Three potentially dangerous incidents (two of them in which Pattern ships were flown into the judges) were fortuitiously uneventful; but the moral remains: pilot error is the thing to guard against.

Phil D'Ostilio once again pulled a win with his Zlin in Sport Scale. Al Spivak came second with his Yak, and Burt Williams came in third with his Akrosport. In Pattern, Bob Krafft took Novice; Seeley Kellogg, Advanced; George Buzel, Expert; and, Denny Donahue, Master.

This 'n That

• Old Timers (FF) at the Nats was held on Friday at San Jacinto Valley. After 14 years of competition, the 30-second Antique Trophy originated by Frank Ehling finally made its way to Sal Taibi's house. Other winners included: George Perryman who took both Stick and Cabin in the hotly contested Rubber events; Rasmussem, Class A; Nadolski, Class B; Longstreet, Class C; Gallas, .02 Replica; and, Steve Perryman, Junior Rubber.

• Peter Lloyd of Australia obliged his hosts up in Washington by winning the A/2 event at the Kangaroo Kontest they threw in his honor. The meet was a sweepstakes deal in which the entry fees were split up 50—30—20. Other winners included: Dale Segle, Junior Nordic; Tom Cashman, SCIF; Dave Nordlund, OT; Mike Nagasawa, Rubber; Bruce Kimball, HLG; and, Dave Knight, OT Rubber. Lloyd won his event by a decisive 1127. J. Pommert was second (923) and J. Thornbury was third (919).

• Dick Franco who CD'd the SACRAT's Sport Scale meet reports that sentiment is running strongly in favor of reviving the "Scale Contests at Livermore" theme. The boys hope they can get things organized and off and running by next season. After the last meet, it seems that most of them woke up to what they'd been missing. Reportedly, it was one of the "fun" meets of the year. Winners were Virgil Van Bibber, Dick Oglesby, and Jin Kiger.

• Got to hand it to Steve Helmick; that Bat Sheet has become one of the best sources of plans, info, and chatter on things FAI and FF. Write him at 14804 Corliss Ave., No., Seattle, Wash. 98133 for sub info. You'll be glad you did.

• Howie Halm's bulletin reports that the Illinois Valley boys have completed arrangements to shift their flying site out of the zone of contention with the irate farmer. The farmer on the new site has offered to prepare the ground, seed it, and even erect an entrance for them. Just goes to show you the difference in people.

• Down in Birminham, the R/C boys are moving ahead with their plans to enlarge the metal shelter at their field. Projected improvements call for extending the shed another thirty feet in length. Hank Arnold has made arrangements for the materials. And Tom Long is wangling some heavy equipment to fix-up the road and to take some of the bumps out of the field. When completed, the metal structure will be 70 feet long—that ought to provide plenty of shade.

• Did you catch the report on TV of the California flight of the first man-powered aircraft, the Gossamer Condor, to successfully meet the conditions laid down by the Royal Aeronautic Society? The ship looked like an outsized Indoor job. It had nearly 100 feet of span and weighed-in at a mere 70 pounds. It flew the figure-8 course, clearing the ten-foot obstacles, propelled by the pedaling of Bryan Allen. The ship was designed by Paul McCready and engineered by Vern Oldershaw. One of these guys has got to have a modeling background.

• The Northern Conn. R/C Club has been getting a lot of mileage out of flying demos in the Springfield/Hartford area. Early in September they sent a gang out to Barnes Airport to an air show which drew about 6,000 paid spectators. They set up a booth and flew a fast-paced half-hour demo. At times, the crowd around the display was lined-up three deep. The gang was kept busy answering questions and handing out giveaways. They also got a nice write-up in the press coverage of the show. The show was sponsored by the Rotary Club, and you can bet the R/C portion will be scheduled again, next year.

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• After one of the best-run Stunt segments at the Nats in years, it isn't surprising that Director Arlie Preszler complains that he got to see very little of the Nats. On a typical day, he and Ass't CD Lanny Shorts were out of the bunks at 6:00 A.M. and on-station and working by 8:00. They didn't let up until 3:00 P.M. at which time a dip in the pool and some liquid refreshment was in order. By the time they'd cleaned-up and eaten, it was time to get ready for the next day's flying. Would they do it again? You bet!

• Got my first copy of the MACA News letter this month and what follows is what a guy can learn by reading his mail. However, I want to point out that the Newsletter is unmistakeably the work of Ben and Patty Sasnett and is a good job. Write for a sub at 1443 McKinley, Escondido, CA 92027.

One result of the Nats was the reinforcement of MACA's Top Twenty rating system. The Number Ones for '74, '75 and '76 fought it out and finished one-two-three. Mike Guthomson ('75) was first; Bob Burch ('76) was second; Chuck Rudner ('74), third. Incidentally, there was a lot of dissatisfaction with the flying site expressed, and 65 flyers signed a letter of protest. At one point, a circle had to be abandoned for a time while problem ants were exterminated.

The MACA meeting at the Nats got off to a slow start but picked up steam and generated quite a lot of MACA spirit. The consensus was that the organization is big enough and strong enough to solve its own problems. In general, discussion emphasized the positive, the can-do aspects of the group. Two positive steps which emerged were the current fund-raising effort and a stepped-up membership drive.

During the St. Louis Team Finals, Chuck Rudner won a match from Paul Smith on points but was disqualified for an infraction. Smith refused to accept the win on this basis and opted for a rematch. In the rematch, Rudner got 340; Smith, 337. Chuck, of course, made the Team.

Smith offered an interesting assessment of the ships entered at St. Louis. These ranged from 420-square Superstars to under-200 originals. Voodoos, Demons, Nemeses were common, and so were scaled-down versions of the Bosta. According to Smith, most guys were convinced at the end of the meet that the small jobs weren't appreciably faster. In the future, he foresees no ships smaller than the AMA-size Voodoo. As for motors, the new-technology jobs: Rossi, Cox Conquest, Super Tigre X15, and the Fox Schneurle are the ones to beat.

PHOTOGRAPHY: ANDY SEAY

1977 NAMBA District VII Championships

District VII is moving, both in organization and on the water/**Andy Seay**

The 1977 District Seven Championship was held in Oklahoma City at Ghost Lake, home of the Boaters of Oklahoma. This NAMBA club, since its formation in February 1977, has been able to acquire their own lake, build equipment to handle any large race, and now hold at least one race a month. The club consists of eleven dedicated model boaters who are striving to build and make the sport of R/C model boating interesting and enjoyable in Oklahoma. They extend their welcome to any model boater, IMPBA or NAMBA, to join them in good competitive racing.

This year's championship was full of thrills, chills, and believe me, plenty of

spills. There were forty entries from seven states and the competition was tough. The race was held over the weekend of Sept. 17 and 18, with open water all day on Friday the 16th. On Friday we had strong winds, and if it was any indication as to what was to come, Friday was a good example. Jerry Kimble, coordinator for B.O.O., managed to flip the pick up boat . . . completely upside down! I imagine it will be a while before Jerry lives that one down.

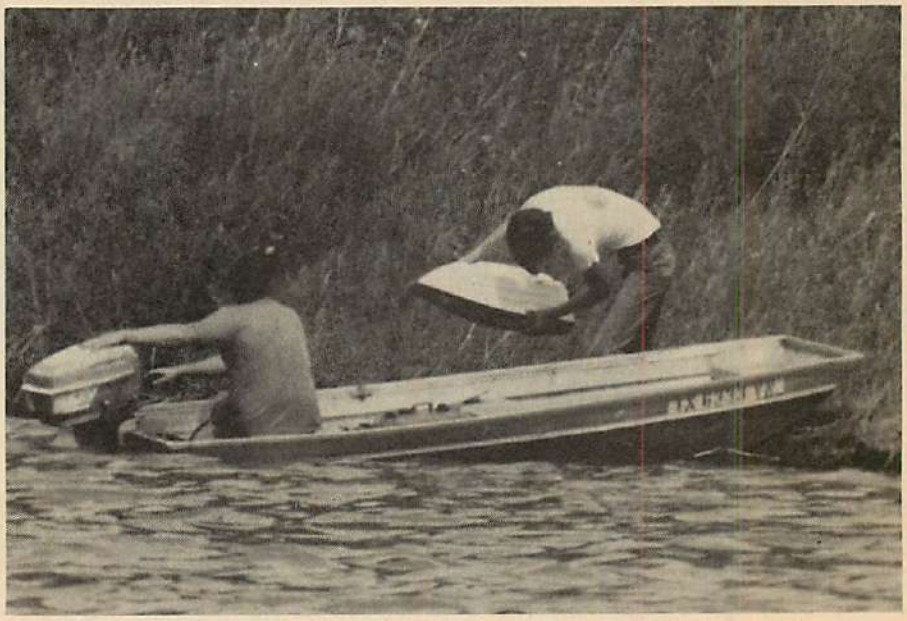
Saturday rolled around with a cool 60 degrees and plenty of good ole Oklahoma wind . . . about 30 m.p.h. gusts worth. The lake was rough which made practice hard and exciting. During practice both Bill McAbee of Del City, Okla. and Bobby Brownlow of Amarillo, Tx. found dry land in the back stretch. Ron Jagger of Wichita, Kan. seemed to get a little excited when an outrigger decided his deep vee needed a push. This didn't help his speed any, but did cause the deep vee to lose rudder control and sustain some damage.

About 10:15 A.M. the race course was closed, and the drivers meeting was called to order by Wes Clark of Oklahoma City. Race time was set for 10:30 with the "C" deep vee as the first class because of high winds. Because of frequency conflicts the class was run off in five two boat heats. There were no real casualties, and the pick up boat crew got the only rest theyould have the whole weekend. The winner of the first heat was Bob Finn of Arlington, Tx., followed by Jim Finley of Wichita, Kan. Bob had 26 laps to Jim's 23¼ laps.

The day was filled with sinking boats, high flying flips, nasty spinouts and a few nose dives. A good example was Joe Bishop of Oklahoma City and his beautiful flat bottom. In the first heat of B Mono Joe looked good until he met the rough waters of the back stretch where his boldness proved fatal, as over she went. But this wasn't all for Joe, for when the outboard class was put to the rough waters his super-fast outboard took to the air again. I might add that Joe's outboard did not win this weekend, but it was definitely the fastest because of the extremely modified engine. Joe told me that next year his company (BMD) will have a boat that will handle the modified power along with the wind.

While we're on the subject of outboards and tunnel hulls, Saturday was a nightmare for those boats. The Oklahoma wind had fun taking the tunnel hulls of Bud Grover and Daryl Garcille and easily putting them in the upside down position. The only small boats that seemed to half way beat the wind were Ronnie Brownlow's Little Crapshooter and Bob Baker's Ski-Daddle.

Even with the wind there was some good, fast racing, especially the first heat of "C" Hydro which was a real crowd pleaser. Bobby Brownlow, Bob Finn, and Tom Bilyue , Al Berry and Denny Preston all got their engines started, and during mill time all five of these fast boats were screaming around the course. Before they could cross the starting line, however, Bobby Brownlow and Tom Bilyue's boats both died in the number two turn. When the clocks did hit zero it was Finn, Preston and Al Berry hitting the first turn together with Finn coming out in the lead. Preston pressed him hard down the back stretch, and as they went into turn two Preston went wide as Finn held the center lane and Al Berry tried to sneak in between Finn and the buoy. He was unsuc-



The photo at **top** shows one of the handsome, well designed trophies awarded at this District VII championship. As usual the crew of the pickup boat was kept hopping during the entire weekend.

1977 District 7 Championships

A Hydro
1. Ronnie Brownlow — Amarillo, Tx.
2. Bud Grover — Clovis, N.M.
3. Mel Lenz — Carrollton, Tx.

A Mono
1. Dan Fox — Clovis, N.M.
2. Henry Schoovoerts — Clovis, N.M.
3. Jim Finley — Wichita, Kan.
4. Ron Jagger — Wichita, Kan.

B Hydro
1. Tom Bilyue — Irving, Tx.
2. Fred McGuire — Okla. City
3. Gayle Lenz — Carrollton, Tx.

B Mono
1. Joe Bishop — Okla. City, Okla.
2. Jerry Kimball — Okla. City, Okla.
3. Marvin Lang — Lubbock, Tx.

C Hydro
1. Bobby Brownlow — Amarillo, Tx.
2. Fred Wall — Amarillo, Tx.
3. Bob Finn — Arlington, Tx.

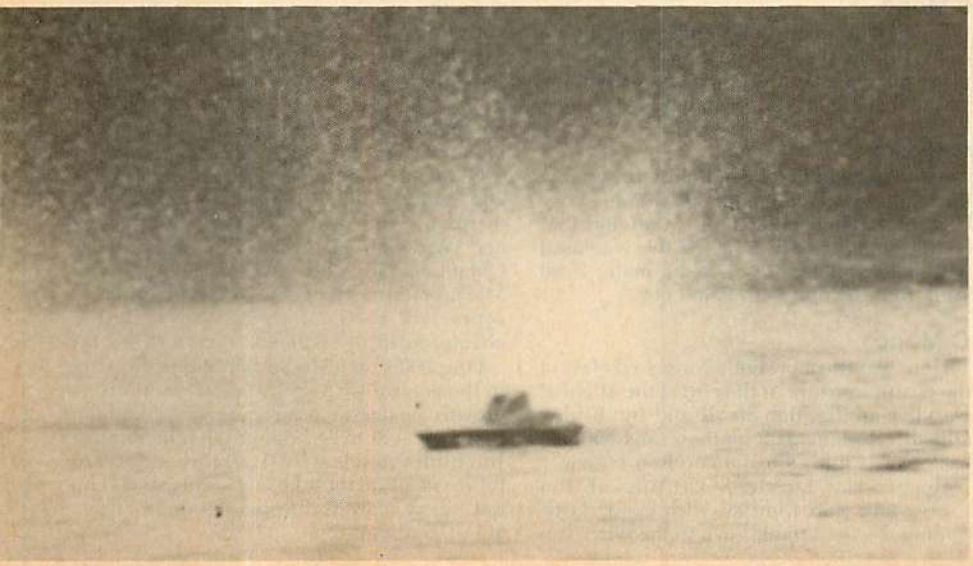
C Mono
1. Jim Finley — Wichita, Kan.
2. Ron Jagger — Wichita, Kan.
3. Daryle Garcille — Cheyenne, Wyo.

C Deep Vee
1. Bob Finn — Arlington, Tx.
2. Jim Finley — Wichita, Kan.
3. Denny Preston — Del City, Okla.

Open Outboard
1. Henry Schoovaerts — Clovis, N.M.
2. Daryl Garcille — Cheyenne, Wyo.
3. Dan Fox — Clovis, N.M.

Overall high point winner: Henry Schoovaerts

Joe Bishop's B-mono boat is being carried back after flipping in the first heat. Bud Grover is in the background. Some of the action had Bobby Brownlow on the outside and Bob Finn inside.



cessful and his boat died. The race was now between Preston and Finn, and what a race it was. For a lap and a half their boats were on top of, around, underneath and crashing into each other until finally, on the last half of the last lap Bob Finn pulled into a good lead while Preston's boat slowed and died. As Bob Finn's boat crossed the finish line, the crowd got to see what R/C boating as all about.

Well, back to the flips which were plentiful. In the second heat of C Mono, Denny Preston blew his boat over during mill time and it started to sink fast. On the decision of the District Seven director and the contest director the race was stopped and the boat was retrieved before sinking to the forty foot bottom.

Also in the second heat of C Mono Bob Finn blew his boat over in the same place Preston had. Bob didn't seem to be too upset until his competitor, Gill DeRoux of Stillwater, Okla. did a beautiful job of centering the downed boat which led to DeRoux being disqualified.

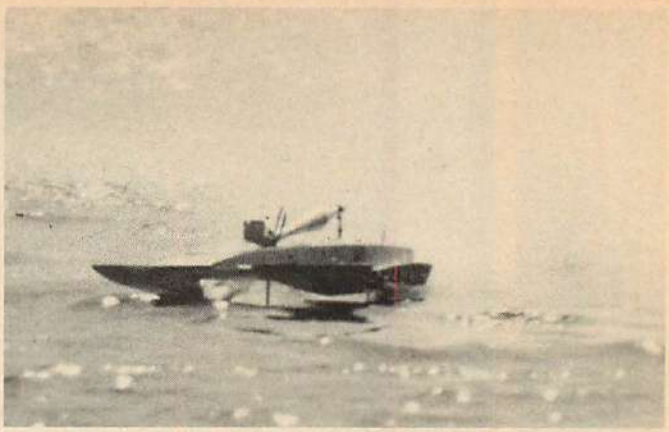
The 3rd heat of A Mono had a good one. Wesley Clark of the BMD team, with a very fast OPS 3.5 Northwind, made like a rocket and flew up about six feet into the air. Finally 6:30 rolled around, which was shut off time for the races. It had been a wild day with everyone trying to stay upright and not worrying too much about how fast they were going.

Saturday night became party time for all. The party was sponsored by the Boaters of Oklahoma, and was held at the Overholser lake boat club house. This club house is the home of the Oklahoma Boat Racing Assn., a full scale outboard racing organization. It is also home of another NAMBA club in Oklahoma City, The Oklahoma Model Mariners. There were plenty of drinks and sandwiches furnished by Mr. and Mrs. Gilbert Bishop. The party was a success, lasting until 1:00 A.M. with everyone seeming to enjoy himself.

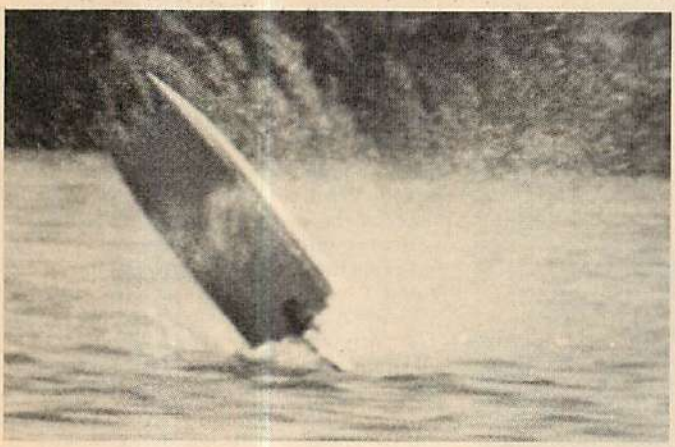
Sunday morning looked to be a better day for R/C boats with only a five m.p.h. gust every now and then and temperatures in the middle 70's. The lake, for the first time in two days, was calm aside from a few ripples. Contest director Jerry Kimball starting things off at 8:30 sharp with the first heat being B Hydro, 3rd round. Everyone was moving a little slowly and stopped to watch as the only woman driver, Gayle Lenze of Carrollton, Tx. gave Tom Bilyue a run for his money. When the rooster tails settled, Bilyue got the 800 pts. with Gayle getting 600.

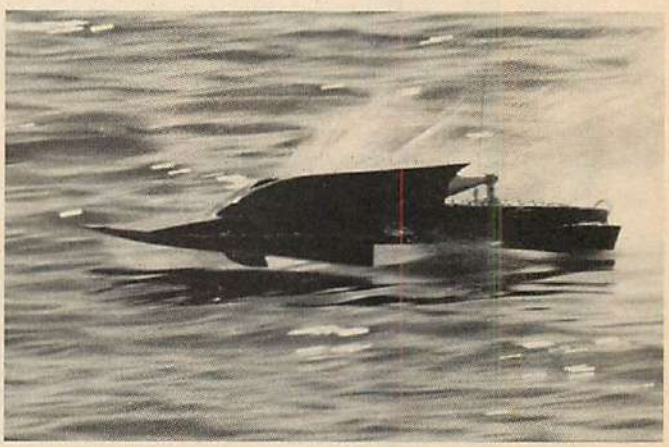
Here we go again! The 3rd heat of B Mono had all the excitement of a demolition derby between Marvin Lang of Lubbock, Tx. and Dave McDonald of Okla. City. The race was close with Lang leading by only a half boat length untill the 3rd lap. In the #2 turn they met each other with a loud crunch! Lang's boat turned upside down and Dave managed to finish with a first place despite a hole in the side of his boat.

In the 3rd and 4th heat of open outboard, Bud Grover and Joe Bishop were racing as if it was still Saturday. In the 3rd heat Bishop did a beautiful high flying flip on the front straight, leaving his boat upside down. Now all Grover had to do was finish and he would have the 800 pts, but on the last lap in the last turn he also flipped. In the 4th heat Bishop could not get his boat started, but Grover flipped again, and Henry Schoovoerts of



Bob Finn and Denny Preston hooked it up (**above**) in the C-hydro class. Joe Bishop's super-fast tunnel hull took this spill on the front straight. A pair of movin' Crapshooters. **Above** is Bob Finn's without top cowl and **below** is Bobby Brownlow's which helped him win C-hydro this year.





Clovis, N.M. hit the finish line first for an easy victory with his outboard deep vee.

Most of the heats on Sunday went smoothly, and the lack of wind made a difference in the point standings, since most of the fast boats could not function consistantly Saturday. So, after 4 heats some of the classes were quite close with the winners not being decided until the 5th and last heat.

Open Outboard

Henry Schoovoerts had this class under control all weekend. At the end of 4 heats he had 3,200 pts. with Daryl Garcille far behind with 2,650. The fifth heat didn't slow Henry a bit as he won it easily taking the class with a sweeping 4,000 pts.

A Hydro

After 4 heats there was only a 250 pt. spread between Bud Grover and Mel Lenz. In the fifth heat, the leader, Bud Grover, had radio trouble and did not finish. Mel finished second behind Ronnie Brownlow, but received only 50 pts for starting. As a result Ronnie overtook a 650 point lead, and won the class by 150 pts.

A Mono

This was all Dan Fox in a small deep VEE with an outboard engine. The Clovis, N.M. driver put together the second sweep of the day collecting 4,000 pts. to win the class.

The fifth heat was exciting however, because of Wesley Clark. Wes finally got his Northwind to level out on the smooth water and had it smokin'. He ran three super fast laps and was on his was to a record run until the fourth lap when he took the #2 turn a little too hard, spun out and died. This happened just as he was lapping the field. I'll bet we will be hearing more from Wesley Clark in A Mono next year, maybe in the record books.

B Hydro

The last heat had the two front runners, Tom Bilyue and Fred McGuire against Gayle Lenz, our woman driver. Tom and Fred managed 50 pts. apiece while Gayle collected the 800 pts. for first place. Bilyue still managed to win the class by 2,350 pts.

B Mono

Joe Bishop finally got things going after a nasty flip in the first heat, with four first place finishes. He won the class with 3,250 Pts, 600 ahead of Jerry Kimball.

C Hydro

After that bad first heat, Bobby Brownlow fired up his C Hydro and took first in every heat after. There wasn't a boat around that could touch his. He finished the weekend with 3,200 pts, while his team mate, Fred Wall, took second with 2,600 pts.

C Mono

Here was the most hotly contested class of the championship. At the end of the 4th heat Daryle Garcille, Bob Steele and Jim Finley all had 2,450 pts. Hot on their tails 150 pts. back, was Finley's teammate Ron Jagger.

Heat 5a saw Daryle, Stuart Russell, Jim Finley and Bob Finn all with good starts, trading the lead right down to the wire. Jim Finley won, beating Bob Finn by a nose, followed by Daryl a boat length back. Daryl beat Stuart Russell by a nose for third. What a race!

Heat 5b was an easy first for Ron Jagger after Bob Steele could not get his boat started and Denny Preston had to quit because of radio trouble. This class was won by Jim Finley with 3,250 pts. Daryle Garcille and Ron Jagger tied at 2,900 pts. and had a runoff which Ron won as Daryle lost the drive line off his boat during mill time.

C Deep Vee

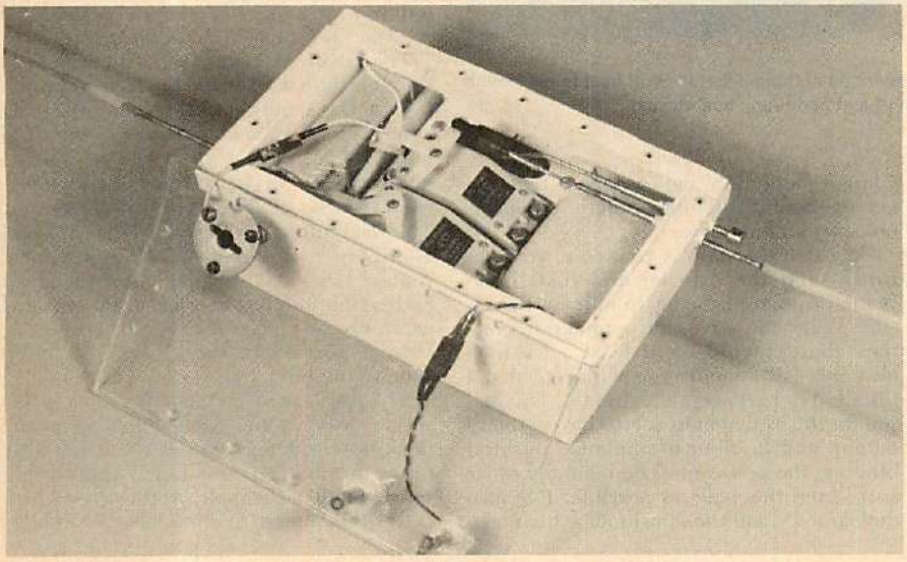
These were 10 minute heats, and there were three heats run throughout the week end. Bob Finn came out as the victor with 74½ laps, followed by Jim Finley with 67.

After 94 heats and 2 runoffs came the trophy presentation. Joe Bishop, the District Seven Director, handed out the beautiful plaques, and that concluded this year's district seven championships. The Boaters of Oklahoma would like to extend a special thanks to Fred Wall who brought the speakers. We would also like to thank our other Oklahoma City club, the Oklahoma Model Mariners, for their full support, and, of course, all the contestants who made the championship possible.

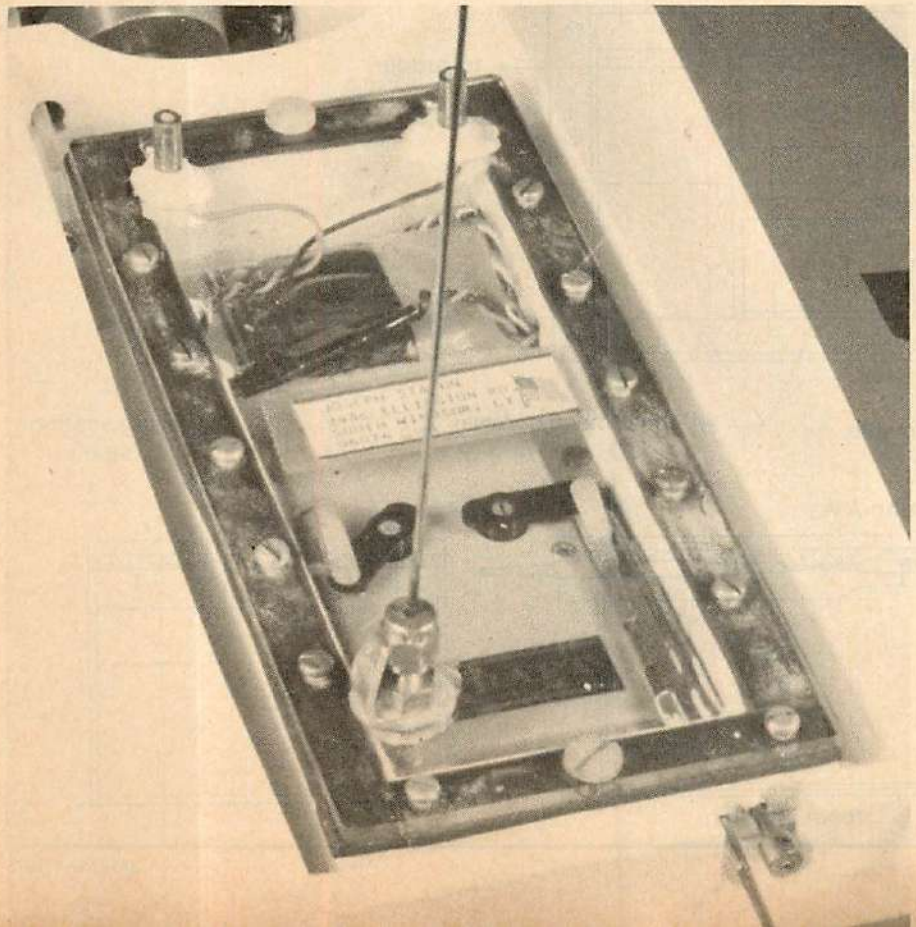
One last note: Model boating is growing in the central USA, but to assure continuing growth we need model boaters to attend the first race ever to be held in Wichita, Kansas. Jim Finley needs at least 30 entries to assure future races on their lake. This race won't be until next year, but it is something to think about. See you there.

Build a waterproof radio box

The first thing that the new R/C model boater gets told is to waterproof his radio. Here's how/**Paul Stakun**



Paul's radio box with the hatch off and the Futaba equipment in it is shown **above.** The shot **below** shows the box with his Kraft brick installed in his 40 Northwind held in with ¼ x 20 nylon hold down bolts.



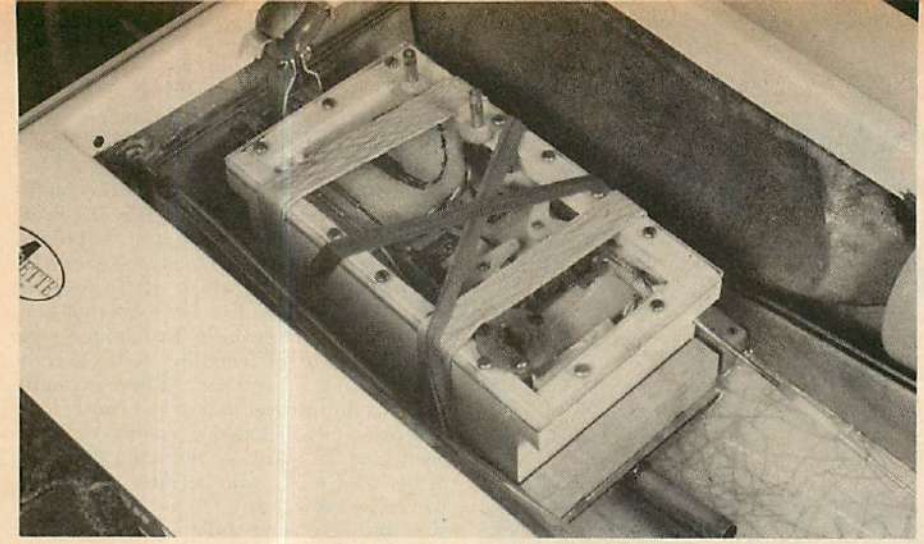
I think that anyone who has contemplated R/C model boating or who is deeply involved in the sport has heard the famous words, "You've got to start by building a good watertight radio box." This is easily said, but everyone has his pet ideas, and the poor beginner is snowed with a lot of suggestions and ideas whcih may, at least, confuse him. I've been boating now for six years and have flubbed around with various means of installing radio gear in boats, both good and bad. At first, my radio box was an integral part of the boat which was okay, but I needed a separate radio for each boat. In addition, servicing the radio or the boat was a pain because everything had to be taken apart. On occasion, a collision during a race resulted in punctures in the side of the boat, you know where. You guessed it, in the radio compartment. The effects are obvious.

Today's modern radios are wonderful pieces of equipment, but we model boaters must protect them from their old enemies, water and vibration. Despite the fact that some manufacturers advertise their servos as being waterproof, don't believe it. Nothing is waterproof, not even my radio box. It does offer the best protection that you can give your equipment, and under extreme conditions, if a drop of water or two gets in, it will take a long time before any harm is done, if any. Another advantage is that if you operate more than one boat, you can make the radio box interchangeable between boats keeping the cost of the hobby down.

The type of construction presented here is an evolution of about four different types that I've used and is one that I am now quite satisfied with. Many of the problems that you may still encounter, such as ease of battery charging and antenna hookup, are ones that I hope to have solved for you.

I'd like to say that you can start by gathering the lumber and start assembling your radio box, but there is a slight bit of engineering that you must do before you begin. I've designed my box around the Futaba equipment with FPS-7 servos. My objective was to make a box with the smallest exterior dimensions so that it will fit in any size boat whether class A, class X, mono, hydro etc. Another consideration is vibration protection. Enough room must be provided for clearance around the servos and for foam padding of the battery pack and receiver. Since we don't have as much room to play with as airplane modelers, more careful planning is required. My radio box is 3½ inches wide, 6¼ inches long (including end flanges), and 2⅛ inches high without cover or sealing tape. You should check your servos and other radio components, then come up with final dimensions that you can live with. It would be a good idea at this point to look at your boat to see what size box it will accept. When you've sketched your intended box, its time to get the wood and glue.

The walls of the radio box are constructed from 1/16-inch plywood. I recommend using a slow curing epoxy glue such as Hobbypoxy Formula 2 because it will penetrate into the wood and make a stronger bond. This is *no* place for 5-minute epoxy and especially water-based glues! Once you have the basic plywood box constructed, install two ⅜-inch square maple flanges on the top inside walls lengthwise. Then glue



The radio box full of Futaba equipment is shown here in the authors 3-D Ruff Stuff held in place with rubber bands. This box is handy in that it can adapt to just about any boat design.

on two ⅜-inch square maple flanges on either end on the outside of the box. These flanges are necessary so that you can attach a secure cover to keep the water out. The end flanges can also serve as a mounting point in the boat. Make sure that you build the basic structure square.

Now that the basic box is complete, mix up more glue and coat the entire structure inside and out. This will prevent any cracking, water absorption and possible leakage and will give you a very durable box that will last. I've used one radio box for four years without developing a crack. When coating the inside with glue, be sure that you get plenty into the corners so that you get a generous fillet for strength. Weight is no consideration here.

Now that this step is complete, you can finish-sand the exterior and install the ⅜-inch square maple servo rails on the inside. When the servos are mounted in position, there should be at least a 1/16-inch clearance all around. You will note that I installed my servos in the middle. The reason for this is that most servos have a rotary output, and in order to minimize pushrod binding, the servos must be mounted as far away from the walls as possible. I've also developed some trick pushrods which take care of the angular motion, but more on that later.

At this point, I chose to paint my box with white epoxy paint, inside and out. Although this isn't necessary, it's much easier to detect cracks or to see any water which may have worked its way inside. Painting is strictly up to you.

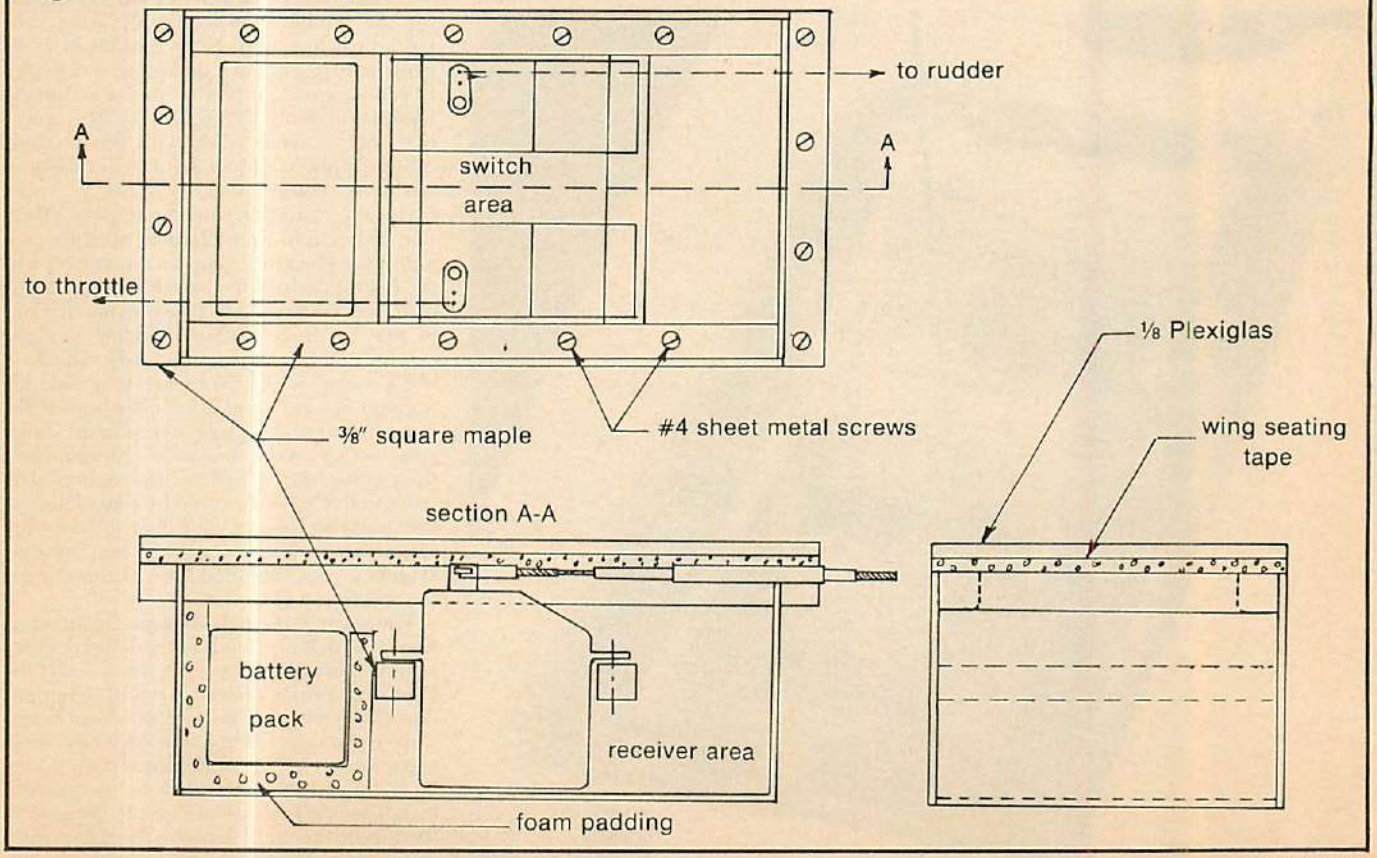
Now the equipment can be installed. The battery pack and receiver should be wrapped in plastic bags and sealed with scotch tape to keep out moisture. These are then wrapped in foam for vibration protection. Secure your servos in the desired location with No. 4 sheet metal screws, ½ inch long. The switch may be mounted across the servo rail either between the servos or against the wall. Again, its your choice. You will have to make some form of plate out of plywood for the switch to fit into.

The pushrods come next. These must go through the walls of the box and be watertight at the same time. I've found that concentric brass tubes, available at the local hobby shop, work well. You will have to grease them for best water resistance. I used ⅛ inch O.D. and 3/32 inch O.D. tubing. The 3/32" tubing has a 1/16" I.D. and a Carl Goldberg 1/16" threaded pushrod can be soldered inside. Drill a ⅛" hole through the end wall of the box and install the pushrod assembly in place loose until you get the correct alignment, then epoxy the outer tube to the box.

As I mentioned previously, rotary output servos create some angular motion in the pushrods and may cause the concentric tubes to bind. To cure this, I spliced in a short length of 1/16-inch throttle cable which is flexible enough to eliminate the problem

PHOTOGRAPHY AND ARTWORK: PAUL STAKUN

Fig. 1 Radio box construction

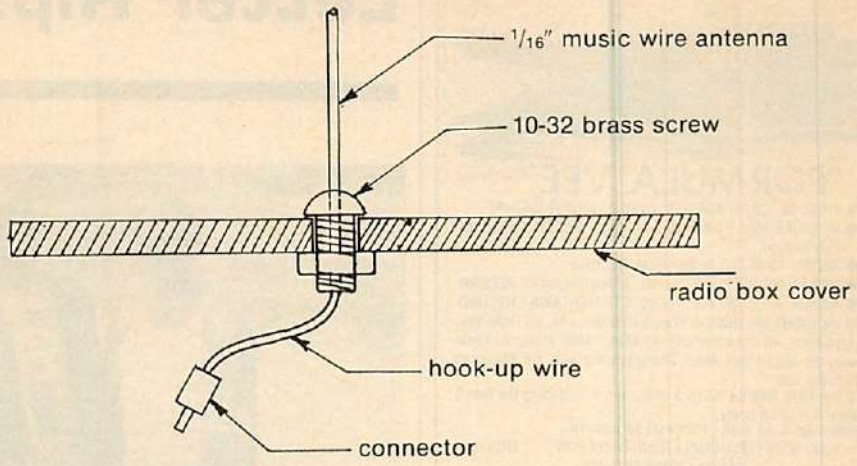


and stiff enough to take pushrod forces. No more than ½ inch of cable should be exposed as it could buckle under heavy loads. Build your pushrods as shown in the figure after you have determined the length necessary. When you solder in the cable and threaded rod, make sure that the solder flows well into the joints. Don't solder the exposed part of the cable. If you are leary of this arrangement, I've been using it for years on my Big Mixer and OPS 60 powered Ruff Stuff and have never broken or buckled one. Don't forget to make a pushrod for your switch. No cable is required, so a simple Goldberg threaded pushrod inside the concentric brass tubes is okay. It goes without saying that the pushrods should be straight with no binding built in. You don't want to overload the servos.

Now we're ready for a cover. For a seal, use ⅛" wing seating tape available at the hobby shop. The dense, closed-cell variety is preferred. Make a cover from ⅛" Plexiglas and drill it for No. 4 sheet metal screws. Drill corresponding, although *smaller* holes in the maple flanges. The cover can then be screwed down onto the tape. Don't be afraid to compress the tape to at least ½ its original thickness. Again, you can grease the tape for best results.

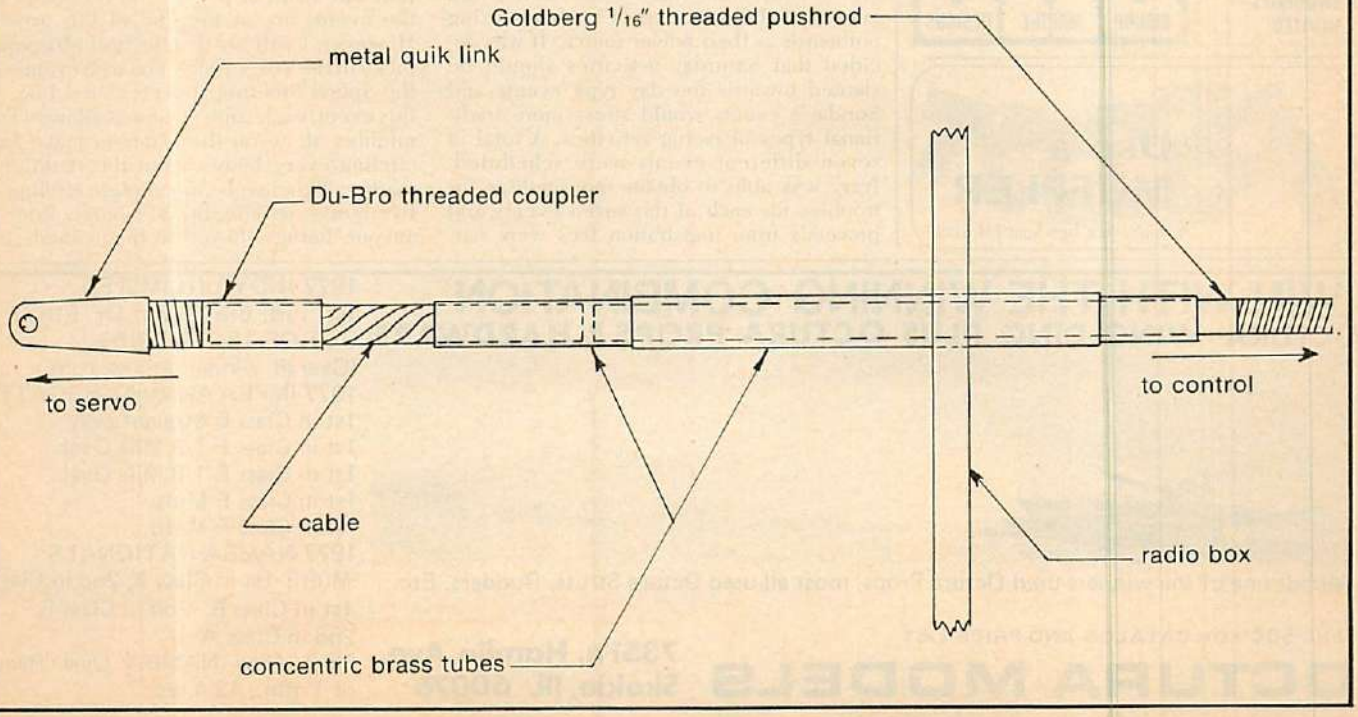
One last detail that has befuddled so many new boaters is how to run the antenna wire. I usually cut off the antenna wire six inches from the receiver and solder on a one pin connector from a four pin Deans. Then, get a 10-32 brass screw from the hardware store and carefully drill a 1/16" hole down the center. Solder in a 1/16" piece of music wire, the *same* length as the piece you've cut off the receiver. Drill a convenient hole in the Plexiglas cover (take it off first) and install the screw with the whip antenna. A short pigtail of hookup wire with the other half of the one pin connector can either be soldered into the hole in the screw or secured under the nut. Seal the screw with RTV (bathtub seal). I am working out a bayonet type quick disconnect antenna device with a friend, and maybe I can report on that later if time permits. As an option, you might consider installing a charging jack into the cover or run a couple of wires to two 4-40 screws through the cover to facilitate charging the battery without removing the cover.

Fig. 3 Antenna connection



Mounting the box in your boat is your option. It can be held in place in rubber bands so long as it can't shift in place or a ¼ inch hole can be drilled through the end flanges so that a ¼ inch nylon wing hold down bolt can secure the box to the boat. Again, for vibration protection, any contact between the radio box and the boat should be cushioned with more wing sealing tape or rubber bands. This small precuation means longer times between factory service. I hope that these suggestions get you well on your way in model boating. If you take the extra time to make a good radio box, it will last you years and many boats.

Fig. 2 Pushrod exit



Letter Rip!

Some of the winners at the First Annual Mini Outboard Championships included John Haven's (kneeling), (left to right) Larry Knudson, Tim Harvey, Jerry Dunlap and Bill Brazzle.

First annual northwest Mini Outboard Championships

Borst Park in Centralia, Washington, was the site for the First Annual Northwest Mini Outboard Championships held on October 15 and 16. Hosted by Maren and Jerry Dunlap, with lots of help from their friends, the event drew eighteen contestants from Washington, Oregon and Canada. The idea of having a two day event for mini outboards was proposed by Jerry after he returned from the First Annual Golden Gate Outboard Regatta last year in San Francisco. The NW Mini OB Championships, however, was conceived with the idea of offering a variety of different events for boats using outboards as their power source. It was decided that Saturday activities should be slanted towards fun day type events and Sunday's events would stress more traditional types of racing activities. A total of seven different events were scheduled. Jerry was able to obtain sponsorships for trophies for each of the seven events and proceeds from registration fees were earmarked towards his campaign fund for NAMBA president.

Prior to the first event on Saturday, there were two hours of open water for testing purposes. This allowed everyone sufficient time to properly trim their boats and adjust needle valve settings. A Poker Rally was the initial activity of the NW Mini OB Championships. For this event, all contestants were allowed to enter one five minute enduro race to accumulate as many laps as possible in that time allotment. The total number of "clean" laps was then divided by two and the contestant received that many cards to play one hand of poker. The results for all the events are at the end of this article. However, I will say that the host was pretty lucky in the Poker Rally. The next event was the Speed Steering and Predicted Log. In this event, each contestant was allowed five minutes alone on the water to make laps circling every bouy except the start/finish marker. This involved complete circling of five bouys marking the M-Course. Prior to anyone being allowed to begin their run,

everyone had to predict what they thought would be their best time for the Speed Steering portion and this became their time for the Predicted Log. So this actually became two events rolled into one. Bill Brazzle, a Tacoma hobby dealer entering his first model boat race, was politely informed that a prediction of, "Three days and four nights" wasn't at all acceptable. It was interesting to see what some of those who had never tried this event wrote down for their predicted time. Tim Harvey, New Westminister, Canada, predicted he might be able to do the course in 1:30 and then took his beautifully finished Steve Muck "Lil Lightning" out on the water and turned in the fastest Speed Steering time with a 45.6 second tour of the course. As can be seen from viewing the results, the finish in the Predicted Log portion of the event was extremely close. Saturday's action closed on a fast note with the running of the M-Course event. Each entrant was allowed two five minute enduro heats using the M-Course. Total laps after ten minutes determined the winners. Driving the M-Course provided a real test for some of the circle racers who had spent the whole racing season going in ovals. After the two five minute heats were concluded, the top boats on each frequency were eligible for a Grand Prix. This allowed us to have a six boat field. Our only collision of the event took place on the first lap of the Grand Prix when two boats tangled and flipped at the middle of the M. The race went on and proved to be a real fine battle between Tim Harvey and Bill Brazzle. Tim's and Bill's "Lil Lightnings" really seemed to like the M and Tim finally prevailed. The collision on the first lap of the GP eliminated our winner of the ten minute portion, Larry Knudson, who drove his very quick Dumas "Hotshot" extremely well during the entire two day event.

Sunday brought out a number of new people and the wind also arrived. After nothing but calm water on Saturday, the wind on Sunday added a whole new dimension to the racing program. Trying to keep an air-trapping tunnel hull on the water with gusts up to fifteen miles per hour is a real challenge to say the least. A few tunnels were actually blown over while just barely making headway. The two hours of open water was used to try to trim boats for what looked like a day better suited for sailing than outboard racing. Deep vee heat racing was the first event on the agenda for Sunday. Only five deep vees were on hand for the event and it soon became apparent that just finish-

ing was going to be a major achievement. Only one boat was able to complete all three heats and three of the boats never finished a heat at all. With our District going to a Tunnel Class for outboard racing at the District level in 1978, it may be that outboard deep vees will be relegated to a fun run boat rather than a true racing class. If the number of vee entries was disappointing, the sixteen tunnel boats entered in the heat racing was most encouraging. Unfortunately, the wind proved the real winner in this event and many heats saw all but one or two boats eliminated by blowovers. Winning a tunnel boat race under such conditions takes skill as well as luck and our hobby dealer, Bill Brazzle, showed he had both as he was the only contestant able to finish all three heats of racing. The infamous "Dunlap Rule," if only one boat is running bring him/her in and get on with the program, was applied in more than one instance when the wind caused a one boat race. So a few people got their 400 points rather quickly; but we also moved the racing along. The three way tie for second after three heats of racing was resolved when all three fellows became eligible for the Heat Racing Grand Prix. Seven tunnels were able to qualify for the GP and it was a dandy race. When Larry Knudson's quick "Hotshot" floundered in the wind, Tim Harvey was right there to take over and finish in the lead just slightly ahead of John Havens. It was in the 10 Minute Enduro, however, that John finally got his Dunlap designed tunnel really working. A special feature of this event was a required pitstop with the engine being killed, fuel added and then restarting. During the elimination enduro, John was the only boater able to run the entire ten minutes without having to row after his boat. He lead the rest of us by six laps or more. The 10 Minute Enduro Grand Prix featured the biggest heat of the event when eight boats qualified. Larry Knudson, who used to race full size tunnel boats, was our early leader. After two minutes of racing, however, Larry encountered some misfortune and flipped. Other boats began falling aside and at the five minute mark, only Jerry Dunlap and Bill Brazzle were running. Five boats soon joined in again and the race ended with six boats still racing. Consistency paid off for this writer as I barely edged out Bill by ¾ of a lap.

All in all, everyone seemed to think the First Annual NW Mini OB Championship was good fun and good racing. We already have a bid in from the Longview R/C Boaters to host the Second Annual OB Bash. I think the event proved that people enjoy racing boats that look like boats. No one complained about having to have drivers. And I have to admit that there were some rather unusual creatures positioned in some cockpits. In fact, there didn't seem to be much complaining at all. But then it could have been that I was just too busy racing to pay any notice. I especially want to thank the fine individuals and firms who sponsored the events. They were: Dumas Boats, G & M Models, K&B Manufacturing, Octura Models, Blue Max Models, Firgrove Hobby Supply and Bill's Hobby Town. It's rather interesting that Bill Brazzle won one of the trophies he and his wife Ruth sponsored. I also want to give a sincere thank you to my good friends from Longview, Rick and Judy Hollister and Vic and Cindy Roberts for supplying all the equipment and doing most of the officiating. We'd never have made it

without you. I, for one, am already looking forward to next year's race.

Dates set for the 1978 R/C Unlimited and R/C OPC World Championships

August 2, 3, 4, and 5 have been set as the dates for the 1978 R/C Unlimited and R/C OPC World Championships at the Kent Lagoon near Seattle, Washington. This event will mark the first time a national model boating contest has been staged featuring scale unlimited hydroplanes and semi-scale Outboard Performance Craft tunnel boats. The R/C Unlimited and R/C OPC World Championships is being hosted by a committee of model boaters from the Seattle area. Serving on the board of directors for this event are: Roger "Czar" Newton, Ron Erickson, Les Ruggles, Bill Osborne, Gary Jensen and Jerry Dunlap.

Plans call for two days of testing and qualifying beginning on Wednesday, August 2. Racing will begin on Friday, August 4 with qualifying heats. The R/C Unlimited boats will race in three qualifying heats for positions in a winner take all final and two consolation final heats. The R/C OPC tunnel boats will race in four five minute enduros with total laps determining the winners. Top R/C OPC boats from this event will qualify for a 10 minute enduro with a mandatory pitstop.

NAMBA R/C Unlimited rules will apply to the R/C Unlimited portion of the World Championships. Since there are no rules presently existing governing outboard tunnel models, semi-scale models of Outboard Performance Craft tunnel boats will be accepted. Examples of this type of boat can be found in most copies of Powerboat Magazine. The R/C OPC model must have a realistic driver. The paint scheme must reflect that of boats that commonly race in full scale OPC tunnel races. The engines for the R/C OPC class must be stock employing only those modifications provided for by the manufacturer. There will be awards for Best Scale Model in both divisions.

IMPBA members who race R/C Unlimited or R/C OPC tunnel boats are invited to participate. Even though NAMBA membership is required, IMPBA members who pay their registration prior to June 30 will receive paid membership in NAMBA at no extra cost. This is being made possible by sponsors agreeing to pay the extra money it will take to purchase NAMBA membership for IMPBA members. This cost is not being picked up by those who already belong to

NAMBA and will be attending the World Championships. It will be necessary for the R/C Unlimited boats to meet the NAMBA noise rule of not more than 95 db at 50 feet.

Special attractions for the 1978 R/C Unlimited and R/C OPC World Championships are an Awards Banquet and guided tours of the Stan Sayers Hydro Pits while the unlimited boats prepare for the Seattle Seafair Race. It will also be possible to watch the running of the Seafair Race on Seattle's Lake Washington on Sunday, August 6.

Those interested in finding out more about the R/C Unlimited portion of the World Championships should contact Roger Newton, 14518 167th Pl. S.E., Renton, WA. 98055. Those desiring more information about the R/C OPC part of the event should contact Jerry Dunlap, 6702 Mt. Tacoma Dr. S.W., Tacoma, WA. 98499.

Make plans now to be in Seattle the first week in August for what should be the biggest scale model boat race ever conducted—JERRY DUNLAP.

Boats and frequencies

Due to the ever increasing popularity of model boating and the ever decreasing amount of frequencies which we as model boaters can use safely without getting blasted out of the water by CB'ers using sliders of the 27 MHz band, I as a long time boater and one who wishes equal rights for my fellow boaters, think that it is about time the FCC realized that we are here to stay and grow.

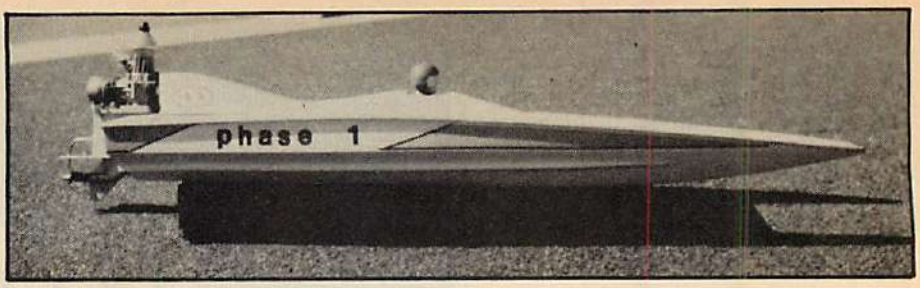
As boaters we realize that if by chance we are operating a boat faster than 50 m.p.h., it would be disasterous if the radio was suddenly made useless. Someone could get hurt badly.

I propose that a quick solution would be for the FCC to open up the rest of the 72 MHz band to model boaters. I cannot see the reason that we are not allowed to use the whole band since I have rarely seen or been to a race site where there is an R/C flying field within range of our radios. Maybe our flying buddies think that because of their numbers they are entitled to have frequencies of their own. All R/C enthusiasts should be working together to make R/C grow and prosper. Other than what I've mentioned there is no reason we all cannot use the 72MHz band and I as a member of NAMBA and IMPBA ask each individual to sit down and write the FCC concerning shared use of all the 72MHz frequencies. Let them know you're out there. Do not sit back and let the other guy do it because it will take all of us to get what we so badly need. Don't let model boating become a thing of the past.

PAUL SCHUMACHER
East Meadow, N.Y.

Product notes

3D MODELS, *P.O. Box 972, Port Huron, MI 48060,* has just released their newest "hot" item, a thirty (30) inch tunnel hull called Phase I designed primarily for use with the new 3.5 outboard engines. The boat is of sleek picklefork design and may also be set up for a conventional inboard installation. The kit has three pieces, the deck, hull and cowl for fast, easy construction. Phase I is also available factory assembled. Send $.50 to 3D at the above address for a complete catalogue of their offerings.



IMPBA Roostertail

I want to start out this month's column with an update to the list of safety recommendations given in last months column. It happens to be a procedure which is followed in all other forms of racing. At each regatta a safety director be an appointed position just like pit managers, contest director, judges, referee, etc. After a boat is involved in a collision or runs out of control or hits the shore or comes into the pits at an excessive speed, it must be checked out *after* the repair by the safety director before it is allowed to run again in the contest.

One of the reasons for considering a safety inspection after an incident was an accident which occurred at the 1977 Internats. Scott McGuffin severely cut one of his fingers after trying to launch a friend's boat which had a damaged sponson that fell off during launch. This accident could have been prevented had a safety inspection been performed before the boat was allowed to race.

There seems to exist a lack of knowledge concerning medical insurance on the boaters themselves. The IMPBA does not have medical insurance on the boaters because it would be a duplicate coverage over the medical insurance which we all are already paying dearly for. It makes no sense to pay twice for the same insurance. I am sure you wouldn't buy two policies on the same car. In any case, if there is anyone out there who does not have coverage on themselves or who is interested in having IMPBA purchase coverage at an additional cost to the membership, please let me know so that I can take an accurate poll. It bears repeating that the IMPBA is your organization and if you really want something, that is what you'll get.

I would like to give a special vote of thanks and praise to the Indy Model Boat Club for an action that they performed recently. I must add that I am a member of this club and had no part in initiating the action. At a recent meeting, the club decided to donate $150.00 to the IMPBA to help get the timing sights developed. In addition to that sum, they decided to take up a collection at the meeting and came up with an additional $162.60 from the members for a total of

$312.60. The members of the club include Jim Alexander (President), Bob Schaaf (Vice-president), John Ackerman (Secretary), Bill Harris (Treasurer), O.M. Cockerill, Marten Davis, Bob Finley, Paul Jablonski, Dave Lee, Fred McBroom, Dick McWayne, Don North and Len Skwiera. All I can say is thank you to a great bunch.

I would like to reply to Mr. Bob Finley's letter in the *Letter Rip* section of this magazine. Some of the items mentioned have already been resolved or are presently under consideration. First of all the Northwind has been submitted and accepted as a legal monoplane hull. The rules regarding lap strakes terminating before the transom of a hull has been further clarified and reported in our 1st Quarterly Report. It has always been legal to have lap strakes terminate before the transom. The rule regarding increasing the number of laps for .19's and .40's to 5 and 6 laps respectively is presently under consideration as a rule change.

The last item Mr. Finley discussed regards the two boat rule. Since I have never had the opportunity to give my viewpoint on the subject, I will do so now. First of all, I support the rule. I would have to say that the vast majority of people I know support the rule. The first fact that supports the rule is that you can only schedule a limited number of races in one day. I have seen a number of races recently which could not complete three full heats of competition due to the quantity of boats in attendance. This means that if you added even more boats, you might only be able to complete one heat. This would also mean that a person who would only run one boat would only get to run once compared to some selfish boater who might be able to afford running once in each class of competition. I ask you, is that fair? A second reason is that there are some events that I have attended where a vast majority of the trophies went to only a few competitors. True, the fellow was very good and most deserving, but he or she sure didn't need all of that hardware to prove that they were great model boaters.

The major complaint is that we travel so far for only a few runs or races. My contention is that the more boats allowed to race, the worse this situation will become. It could even lead to a point in time where you would only have one heat to determine the winner of a class. Is that a solution? No way!

Now lets put on our thinking hats and figure out a way to allow more and more competitors the opportunity to race on any given weekend. The answer is that with the large increase in the number of model boaters in this country we are getting to a point in time where we must start limiting the number of classes to be run at any one event. This is not to say that we should eliminate any of the classes. I have certainly heard of and participated in events which have been all outboards, all hydros, all monos, only deep vees, only scale hydros, etc. This sounds more like a solution to our problem since at these events you may be able to have up to five heats or more which really tells you who won a class. This solution would also aid in increasing the number of participants in some of the less popular classes since those classes could be grouped on a given weekend. An example would be a race for .19's only including all classes. Some people only race hydros, other only monos and others, only deep vees. It seems silly to me for a mono person to go to a two day event and

only get to run three heats. When they could have a mono-only event and get to race 6 or 7 heats. This would give us a better determination of a winner as opposed to someone who just lucked into a couple of easy heats.

Now for the substitute boat issue. I agree that it is futile to travel 300 or 400 miles to an event only to crash a boat in the first heat. Back-up boats have been tried before and unfortunately there are some boaters who are so selfish and greedy that they will do anything to win a race. I won't expound as it would be embarrassing to a few individuals. Since our prime concern is to enjoy racing, perhaps back-up boats could be allowed but points should not be counted toward final standings. In this way those who only have one boat in a class would not be penalized for not having a back-up. In any other racing event, substitution of vehicle is not allowed. Imagine the Indy 500 auto race allowing back-up cars for those involved in a crash. If back-up boats were allowed, they would have to be on the same frequency as the one entered.

As president of the IMPBA, I am interested in getting more model boaters participating, not less model boaters and more boats—LEONARD SKWIERA, *President IMPBA.*

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advertising index for January 1978

1977 ALL SIG KIT FUN FLY

COUNCIL BLUFFS, IOWA
COBRA FIELD
SEPT. 25th

DIRECTED BY BUD KILNOSKI
OF BUD'S HOBBY

Left: There were several near-mid-airs during "Kill The Kite", as seen here between a Komander and Kougar. Above: Part of the pit area at Cobra Field, with a mixture of Sig kit airplanes from trainers to scale. Below: Jim Bonanno (Des Moines, IA) flew this black Sig Skybolt.

The annual Sig Fun Fly started four years ago as an All-Komander Contest. In 1976 the Kougar was added and it became the Kougar-Komander Kontest. This change proved popular so this year it was decided to allow any Sig kit to compete. The Komander and Kougar still predominated but other, Sig designs seen included the Kadet, Skybolt, Liberty Sport, Clipped Wing Cub and Klipper. The wildest event turned out to be "Kill The Kite" in which as many as five airplanes were zooming the kite at the same time.

TRY THESE LOW-PRESSURE EVENTS AT YOUR RC CLUB'S NEXT FUN FLY

We're including the contest rules in this report because of the interest shown by readers in the fun events of previous years. The events are designed to have a large portion of luck so that novices will have a chance against experts in most cases.

LOOPS-A-LOT: Object, most loops. Contestant must time his flight, without a watch, to last exactly 2 minutes from liftoff to touchdown. For each second of overrun or underrun, one loop is deducted. (A minus score is possible.)

KILL THE KITE: Contestant is allowed 10 passes at the kite or 3 minutes, whichever is used up first. Keep track of string or tail cuts in the event no one hits the kite! (It's harder than it looks.)

SIG DAYTONA 500: An "S" turn road race course is outlined on the ground with small flags. Several penalty balloons are placed in the track so as to require some additional maneuvering to avoid breaking them. At the end of the course are a final penalty balloon and a score balloon, placed close together, in line with the exit path. 100 points are awarded for successfully taxiing through the course and breaking the score balloon. 25 points are deducted for each penalty balloon broken. The model then takes off, performs 2 loops and lands as quickly as possible. The score is figured by adding the number of points gained to the total elapsed time in seconds.

GRAB BAG PATTERN: A list of maneuvers is prepared in advance, matched to a deck of playing cards. The contestant chooses 4 cards from the deck. The first 3 cards pick the manneuvers to be flown. The last card indicates the "K" factor or multiplier, which can range from 1 (Ace) to 13 (King). Maneuvers are judged on a basis of 0 - 10 and multiplied by the "K" factor.

SIG

CONTEST RESULTS:

GRAB BAG PATTERN
1st Bill Starett, Glenwood, IA
2nd Roy Mills, Springfield, NE
3rd Ron Wood, Omaha, NE

SIG DAYTONA 500
1st Ron Houske, Akron, IA
2nd Dean Copeland, Omaha, NE
3rd Tony Mirabilio, Sioux City,IA

LOOPS-A-LOT
1st Will Hicks, Omaha, NE
2nd Kim Pollard, Omaha, NE
3rd Dave Drumm, Omaha, NE

KILL-THE-KITE
1st Clark Wade, Council Bluffs,IA
2nd Bob Martin, Omaha, NE
3rd Chuck Jones, Spencer, IA

BEAUTY WINNER
Larry Skiles, Camden, IN

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RC-35 KOUGAR	$42.95

Above Howard Kofoed (Omaha, NE) stops the prop on his Kougar. Below: Jerry Cleaver (Omaha, NE), age 14, with his first RC, a Sig Kadet.

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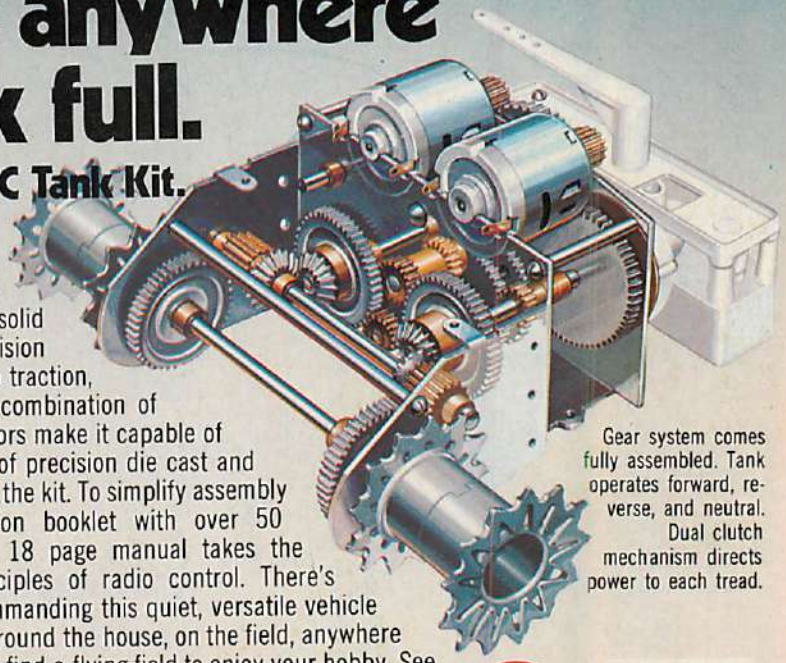

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