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1928-1978

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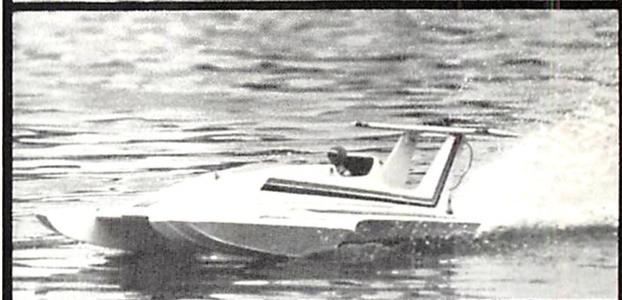
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The Case for Catapult Glider

Hand launch glider. Who can argue with it as an event? Easy to build, cheap, give it a good fling, and if you inject it into a thermal you can almost enjoy watching it disappear into the blue. I wouldn't change a thing. It's a good event. For you. But not for me. I used to fly it, but then it started to hurt my shoulder. If I heave a glider hard I'll be sorry, instantly. There are a lot of other people who have found the same thing. If you're in your prime, with a good throwing arm, glider and technique, you can really make it go. For the older, infirm, younger and lightly built members of the modeling fraternity, it's not an event for us.

Why not, once in a while, even on just a club level, a Catapult Glider event?

Refinements will come with mass participation, but all you really need for a beginning is a deep, smooth notch toward the nose of the glider for a catapult hook; a tail-end finger hold aft of the tail surfaces; and a hardwood stick with a few strands of rubber.

If you can heave a glider in dead air to 100 feet and turn in a minute plus you're not doing badly. Still, it's mighty hard to core it into a thermal at that low altitude. That same glider accelerated by a hand-held catapult can double the altitude, and double the flight time. It also does better than that with it's chances of riding the lift higher aloft. You'll need to really trim for it, and build a wing to take the stress. Catapults can launch your ship with a vengeance. And if you want to see a piece of balsa go to the moon, try a Jetex unit on it, ignited just be-

FLYING MODELS

including FLYING ACES est 1928

flyi models



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on the cover

Rich Uravitch built and took the photo of this House of Balsa P-51 for the FM Product Review on page 28 of this issue. While looking for a different '51 color scheme he came up with this example of Israeli colors in an Arco-Aircam book. Kodachrome: Rich Uravitch

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AA Nicad; Como 40; Mill .075

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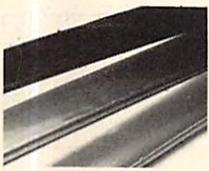
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fore release. The glider will still be going straight up when the power fully comes in. How high? Well hold your fingertips $\frac{1}{16}$ " apart, hold your arm over your head, and that $\frac{1}{16}$ " airspace between your digits is what your glider wingspan will look like after a good launch.

It's not without it's faults. Catapult rubber can entwine and break a launching glider, trim adjustments are critical, and a stake for the launching should be driven into the ground. No person should be in front! Looping gliders are a hazard. Parting wings create a dart. Better launching methods must be developed. What we're saying here is that

Catapult Glider can be fun, it can bring out contestants who can no longer throw so hard, and it can be run as an event in addition to the existing Hand Launch type contest.

Experiment a little on your own. It can pretty consistently get your wood upstairs and we've hardly begun to probe the way.

Air Mail

readers' forum

Thanks

I have had unbelievable response from my letter in your November issue of FLYING MODELS. I have been able to obtain a Redskin kit through Merlyn H. Welch of Ten Mile Hobbies in Hillsdale, Kansas, and Bud Napier of Bud's R/C Hobbies in Liberty, Indiana, is seeing that I get a partially completed Redskin that he started 20 years ago then put aside when he got into R/C. I also received letters from Canada and other parts of the U.S. Thanks to FLYING MODELS and the interest of Merlyn and Bud, I will be able to keep alive one of the all-time great C/L planes—the Redskin. Merlyn is also hunting around for some engines for me. The desire of one flyer to help another has never proven stronger than that displayed by Merlyn and Bud. My thanks to them and to you for running my letter.

RON GRODT
 Somerville, N.J.

FLYING ACES Old-Timers

Having been a model builder back in the days of FLYING ACES I immediately started buying your magazine when I first realized that you were running reprints of plans each month.

This got me to thinking about the many quickie models you used to feature back in those days. Many a time when I was learning to build gas models, I would break away to build one of these simple models and in doing so I sure gained a lot of confidence in being able to finish one and have it fly in a short time.

I really believe that to encourage beginners to get into this hobby, this type of model has its place and I would like to see some in future issues.

In these days of soaring cost (no pun intended) it's pretty hard for a youngster to be able to afford a kit, so if you were to provide reprints, they could just jog down to the hobby store and in addition to saving money by buying their own materials, they would also learn how to select it.

I feel fortunate that I managed to save a dozen or so copies of FA and I still get them out occasionally and read the various stories and articles even though I've done so many times.

In closing I would just like to congratulate you on your fine magazine and hope that you will consider the beginners with an occasional quickie in future issues. After all, you are already giving the modellers a break in selling your mag at a reasonable price.

AL COOPER
 Hamilton, Ontario, Canada

Sympathy

I feel for Kieth Whitney who Ed Whalley wrote about in the *With Model Builders* column in the September 1978 issue of FLYING MODELS. I built my first (and only so far) free-flighter some months ago and the wind blew it into a dog's pen and he chewed it to pieces. My loss might not have been much financially, but it sure did hurt on the inside. I hope someone can help fliers who run into trouble like Kieth's. It should be a federal offence for such vandalism!

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On another note, I really love your new column by Earl Van Gorder for us beginners. Keep up the good work.

DARRELL SELLERS
Murfreesboro, Tenn.

Some praise

I have to complement you on the completeness of your model plane and boat articles. Maybe you could get into R/C cars in the same way.

WILLIAM J. GLOVER
Belleville, Mich.

School days

I teach a sixth grade class in addition to my duties as secretary of the Mid Hudson Modelmasters. When I first joined, I mentioned in a guest editorial that I planned to incorporate aerodynamics and the history of aviation into my curriculum.

In the past month, the planning has become a reality and has turned out to be a fantastic idea for my class and myself. I began by having each student write a biography about someone who had made a major contribution to the development of aviation. Most, of course, chose to write about the Wright Brothers, Chas. Lindbergh or Amelia Earhart. But many found contributors not so well known. There were even reports on Count Von Zeppelin and Nieuport! As a matter of fact, I learned a lot just by reading the reports.

Then we studied the terminology of airplane parts; their function in flight, and how each is controlled. I don't really know who learned more—the kids or myself. We still haven't been able to find out why "yaw" of a plane is called "yaw". Pitch and roll make sense—but where did "yaw" come from?

Believe it or not, even those students who never showed an interest in science can now tell how an airplane maneuvers through the air, why it flies, and the forces of flight—even the difference between Bernoullian and Newtonian lift!

In addition to our studies in science, I've had to teach angle and circle measurement to have them able to understand pitch, roll, yaw and dihedral. So you see, I've tied in Math with Science, History with Science and even English with Science, just in studying aviation and aerodynamics.

The best part of the program is that I've created twenty-three "modeling monsters". We've just spent three entire days building specially designed models for classes like ours—the Vintage Aero Mini Square

Things. I couldn't stop them—they wanted to work on their models right through lunch! And would you believe a child ASKING to stay for detention or missing a recess to keep working on a class project? Mine did.

I've had to practically tear them away. I've even had to threaten them to keep them from trying to fly the models before the glue was even dry! Now, they want to move on to the next step—the Miniprofiles. I take full responsibility. Look out! these are your future competitors!

But lest you think we're only playing with toys on class time, let me assure you we're not. In addition to the Science (aerodynamics), Math (Geometry and measurement), History, and English (writing reports, reading and following directions)—they've developed patience and the ability to stick to it. If they don't, the planes won't fly—and they know it.

We're not finished yet. There's plenty more to learn. We still have to have our contest and then there's our field trip to the Old Rhinebeck Aerodrome to see and learn about the real planes.

All I can say is "WOW". It's been the best experience so far in my teaching career. It's a teacher's dream to be able to stimulate the entire class and keep them stimulated. My particular dream has come true, and, thanks to all you club members for introducing me to this crazy and wonderful world of model aircraft.

DEBBIE ARNOUITS
Poughkeepsie, N.Y.

Timetable

coming events

CLUB SECRETARIES: Items for the FM Timetable are welcome. Submit items typed, double spaced and with necessary information plus contact for complete data and entry blank. Specify AMA, FAI, NAMBA, IMPBA, AMYA, ROAR, etc. Include information on rules and classes to be run. Items will not be picked up from club bulletins to be run, they must be sent to this column.

R/C BOAT CONTESTS

CAPE CORAL, FLORIDA—December 16,17. IMPBA 1/16 straight and 1/3 oval Record Trials hosted by the Gold Coast Racing Team at Nicholas Parkway Lake. Contact: Don Pinckert, 3265 Franklin Ave., Miami, FL 33133. 305/446-5358.

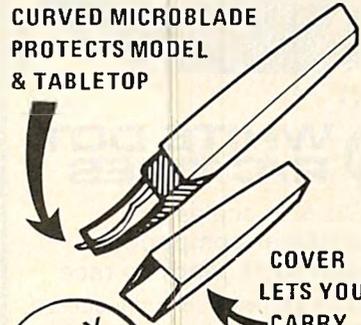
MIAMI, FLORIDA—December 29,30,31. Winternationals 1978. Heat racing all classes. Trophies through 3rd place. Held at Northwest 138th St. and Palmetto Expressway hosted by the Florida Unlimited Racing Team. Contact: Don Pinckert 3265 Franklin Ave., Miami, FL 33133. 305/446-5358.

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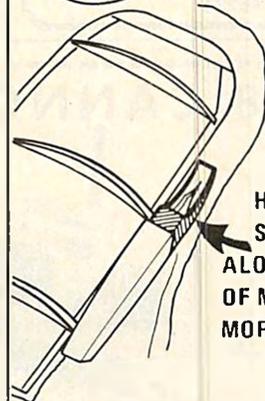
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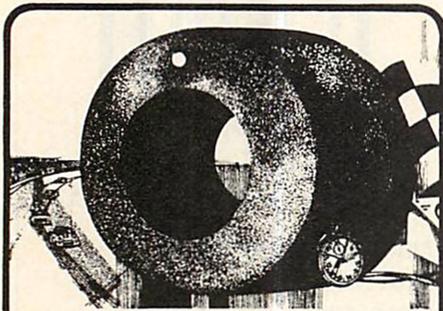
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Flying Report

news and comment

Ham Flyer Alert

Repeaters. Their use is growing in popularity among amateur radio operators (hams). Repeaters, located on antenna towers, receive signals at one frequency and immediately retransmit the same signals on a nearby frequency. Radio range can be more than doubled in this way.

Unfortunately for R/C flyers who operate on the six-meter ham band, an increasing number of these repeaters are appearing near the frequencies normally used for radio control. These standard frequencies are 53.1, 53.2, 53.3, 53.4, and 53.5 MHz. Repeaters are operating on or near these frequencies in many areas of the USA.

It must be understood that the R/C frequencies on 53 MHz are not reserved by law exclusively for radio control. They are available to licensed hams for various purposes, and the repeaters discussed here are legal. However, in most areas, the established use of the R/C channels is respected by other members of the ham community.

If you fly on 53 MHz, keep in mind the possibility that your receiver may be adversely affected by these repeaters, even when they are not exactly on your center frequency. Each repeater channel is nominally 20 kHz wide, and R/C receivers need more than 5 kHz, so channels closer than 30 kHz (0.03 MHz) to the R/C frequencies are particular problems. Additionally, a single

conversion receiver can also experience interference on its image frequency, normally 0.455 MHz above or below its operating frequency.

This table lists repeaters operating between 53.05 and 53.55 MHz known at this writing:

Location		Input (MHz)	Output (MHz)
St. Claire Co.	Alabama	52.97	53.37
Fresno Co.	California	52.23	53.23
Orange Co.	California	53.38	53.72
Colorado Springs	Colorado	52.17	53.17
Disney World	Florida	52.05	53.05
Largo	Florida	52.55	53.55
New Port Richey	Florida	52.47	53.47
Plant City	Florida	52.13	53.13
West Palm Beach	Florida	52.07	53.07
Kennesaw	Georgia	53.525	52.525
Kennesaw	Georgia	53.44	52.44
Chicago	Illinois	53.20	52.68
Indianapolis	Indiana	53.16	52.56
South Bend	Indiana	53.36	52.76
New Orleans	Louisiana	53.545	52.545
Wheaton	Maryland	53.25	52.68
Bellingham	Massachusetts	53.88	53.28
Stoneham	Massachusetts	53.76	53.16
Waltham	Massachusetts	53.66	53.06
Worcester	Massachusetts	53.72	53.12
Grand Rapids	Michigan	52.15	53.15
Excelsior	Minnesota	52.05	53.05
Tunica	Mississippi	52.55	53.55
Concord	New Hampshire	53.68	53.08
Bergen Co.	New Jersey	53.35	52.35
Bedford	New York	52.07	53.07
Durham	North Carolina	52.15	53.15
Fayetteville	North Carolina	52.07	53.07
Mocksville	North Carolina	52.07	53.07
Winston-Salem	North Carolina	52.17	53.17
Beaumont	Texas	53.12	52.525
Dallas	Texas	53.53	53.92
Fort Worth	Texas	53.16	52.56
Greenville	Texas	52.47	53.47

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Rattlesnake			
Mountain	Washington	52.525	53.29
Seattle	Washington	52.29	53.29
Seattle	Washington	53.60	53.20
Spokane	Washington	52.525	53.29

In the future more repeaters can be expected on the six-meter band. Whether a repeater will interfere with R/C activities depends upon a number of factors such as distance from the repeater and from the base or mobile station, the radiated power and frequency, and the frequency response of your R/C receiver. If problems are found to exist in your area, the best course of action is to write a detailed, rational letter to the Amateur Radio Relay League, Newington, Conn., with a copy to the AMA frequency committee, c/o AMA Headquarters. Describe your local situation as fully as possible and request (there is probably no legal basis to demand) action to alleviate the problem.

With our careful attention, repeaters and R/C should be able to coexist with little difficulty. On the other hand, if modelers do not let their voices be heard we could come up against more frequency problems—RICHARD WEBER.

Magnum 80 update

Dick Sarpolus, the designer of the Magnum 80, the twin engined pattern ship that appeared on the September 1978 cover of FLYING MODELS, tells us that he has received letters from people building the ship who want to use the K&B 6.5s like he did but could not find the proper exhaust adapters. Dick says that Russel Zuback, 435 Raritan St., South Amboy, NJ 08879, will make

them, as used on the Magnum 80 for \$10.00 each.

WRAMs dedicate new R/C air park

Westchester Radio Aero/Modelers Inc. (WRAMs), sponsors of the annual Eastern States R/C Jamboree, on July 15 officially opened its new 80-acre flying site in Patterson, N.Y. Rented or leased fields had been used for many years by the 60-member club.

Town officials and residents were invited for a ribbon-cutting ceremony which was followed by a large static display of models and by flying demonstrations.

The field is set in gently rolling hills and features a 225 x 400-foot grass runway on high ground. "It's the kind of beautiful spot you'd like to go to even if you're still building after prancing your last airplane," said Club President Joe Wimbrow.

The parking area has space for about 50 cars and the transmitter-impound rack is topped by a windsock. Future plans may include a field house.

The WRAMs welcome spectators. Field hours are 9 am to dusk on weekdays and 11 am to dusk on weekends and holidays. Patterson is located in the northwest corner of Putnam County.

Product notes

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A beautiful scale model especially designed for the R/C beginner and still be of interest to the advanced modeler. Very stable in flight at all speeds, it quickly compensates for most beginner flying errors when the controls are returned to neutral. Vacuum formed cowl and pre-shaped one piece spring aluminum landing gear — hardwood or plywood used at all stress areas.

TECHNICAL DATA: Scale: 1/4" = 1'-0" • Wing span: 45" (114.3 cm) • Wing area: 270 sq. in. • Length: 32 in. (81.28 cm) • Wing loading: 12 oz. per sq. ft. • Weight: 24 oz. with R/C equipment • Engine: .049 - .051.

KIT No. 1502

Bellanca Cruisemaster

A different low-wing scale model than offered by other kit manufacturers. Like the Cessna 170, it has a "forgiving" nature valuable to novice flyers. It will also satisfy the average R/C "pro" with its smooth flight and handling characteristics. Kit contents include vacuum formed cowl and windshield plus hardwood and plywood to beef up construction where required.

TECHNICAL DATA: Scale: 1/4" = 1'-0" • Wing span: 42 3/4" (108.59 cm) • Wing area: 252 sq. in. • Length: 28 3/4" (73.03 cm) • Wing loading: 12 1/2 oz. per sq. ft. • Weight: 24 oz. with R/C equipment • Engine: .049 - .051.

\$30.00
each

(Kits do not contain motors, wheels and R/C equipment)

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Bellanca
Cruisemaster



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7.4	7.6	7.8	50¢
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9.4	9.6	9.7	
9.8	10.4	10.6	85¢
11.4	11.6	11.8	\$1
12.4	12.5	12.6	\$1.50

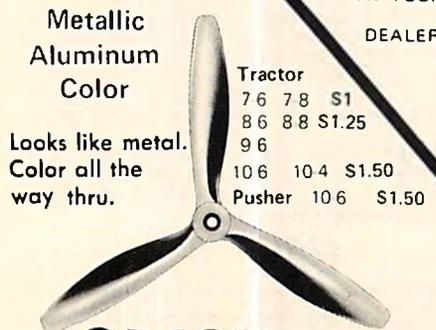


2 Blade Pusher			
5 1/2-3			
5 1/2-4	6.3	6.4	35¢
		8.6	85¢
	9.6	10.6	\$1

3 Blade Tractor			
5.3	6.3	6.4	50¢

3 Blade Pusher			
	6.3		50¢

AT YOUR DEALER



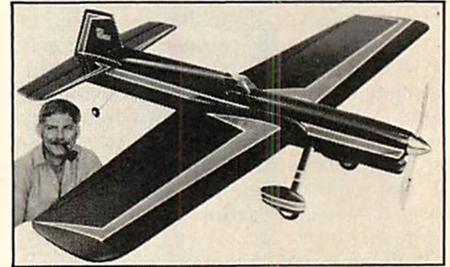
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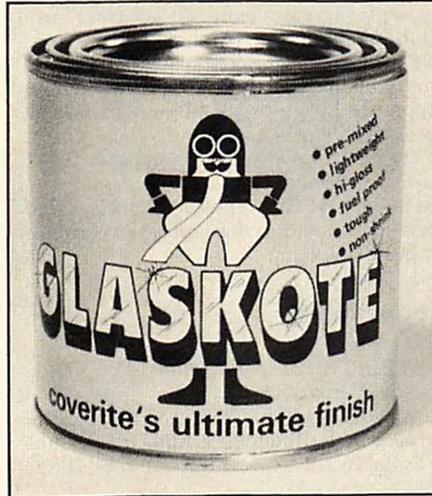
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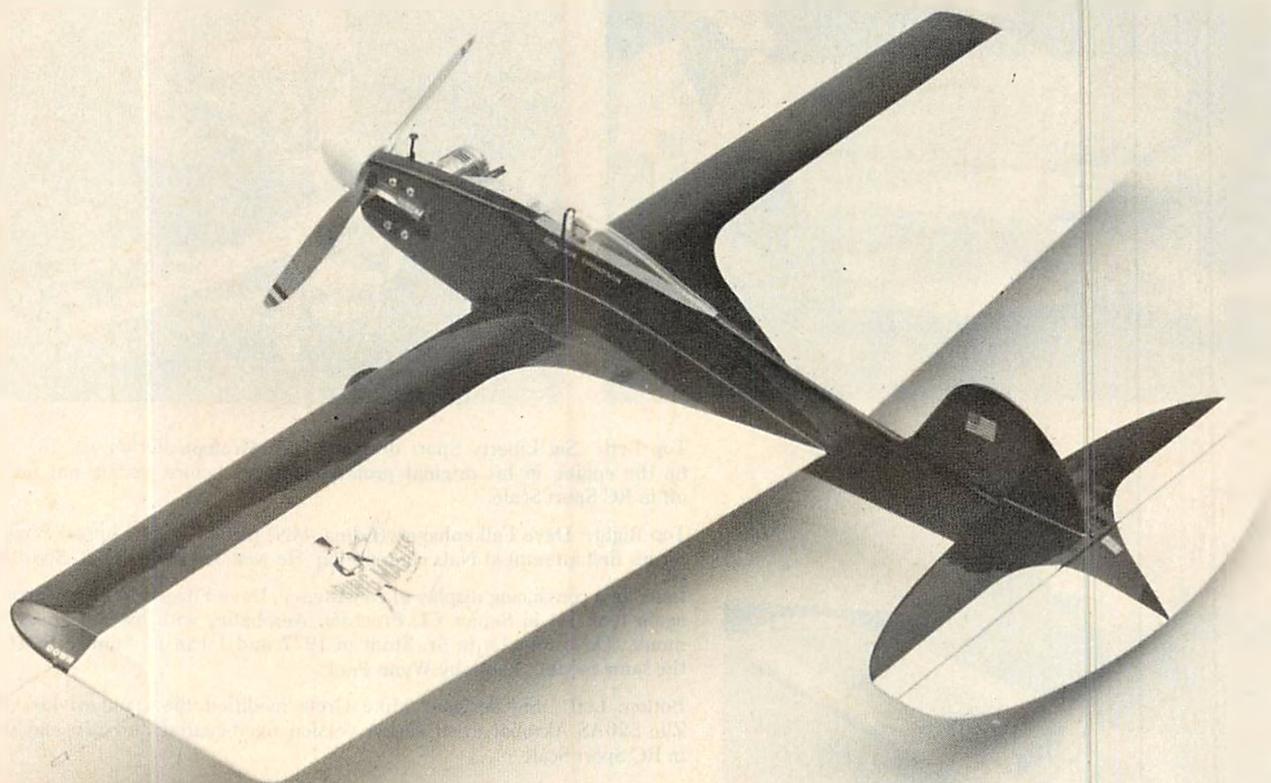
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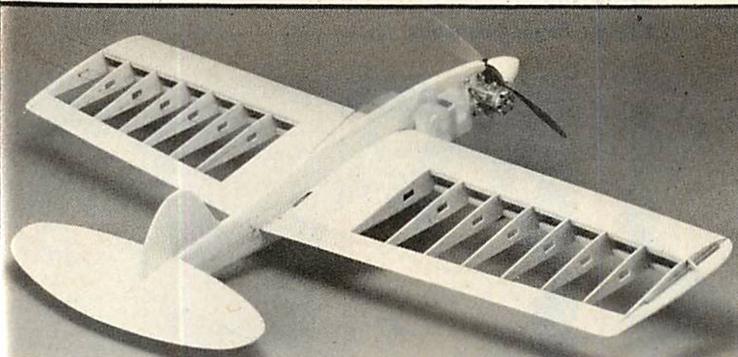
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SIG KITS AT THE 1978 NATIONALS



Top Left: Sig Liberty Sport designer Dick Graham (Ottumwa, IA) warms up the engine in his original prototype model before taxiing out for take-off in RC Sport Scale.

Top Right: Dave Falkenhagen (Edina, MN) picked a Sig Clipped Wing Cub for his first attempt at Nats competition. He won 3rd in Open CL Sport Scale.

Left: In a convincing display of consistency, Dave Fitzgerald (San Mateo, CA) again took 1st in Senior CL Precision Aerobatics with his Sig Super Chipmunk. Dave won 1st in Sr. Stunt in 1977 and 1st in Jr. Stunt in 1976 with the same model. Photo by Wynn Paul

Bottom Left: Sig designer Mike Gretz modified the standard kit version Zlin 526AS Akrobat to an earlier version fixed-gear Zlin 226 and flew it in RC Sport Scale.

Bottom Right: Mike Gretz is shown here with his other Zlin entry, which won 1st in Open CL Precision Scale for the third time in four years.

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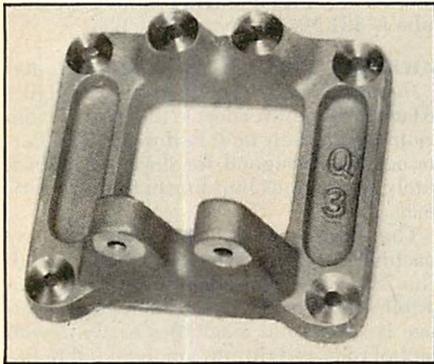
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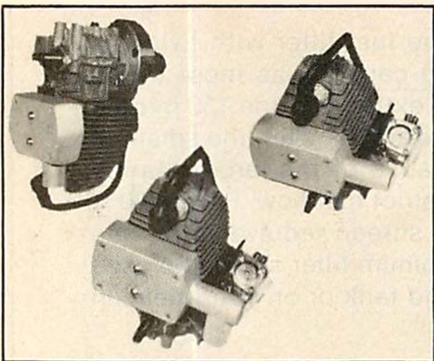
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engines, the Gieseke Nobler also features a 50-inch wing span, wing area of 510-square inches, and a highly competitive flying weight of 38-42 ounces. The new and exciting Gieseke Nobler includes a special "Superform" fuselage top to reduce weight and eliminate time-consuming block carving, and "Positive Alignment" ribbed platform wing construction. Also included are all balsa construction, precision die cutting, molded canopy, molded adjustable lead-out guide, and "Tri-ads" for more precise construction and ease of handling. Other features of the Gieseke Nobler kit are extra-long rock-hard maple motor mounts for added strength, hardware, formed landing gear fairing, 3-inch nylon bell crank lead-out wire, silver soldered elevator and flap horns, and much more.

Top Flite's Gieseke Nobler, will be available soon at all leading hobby shops.



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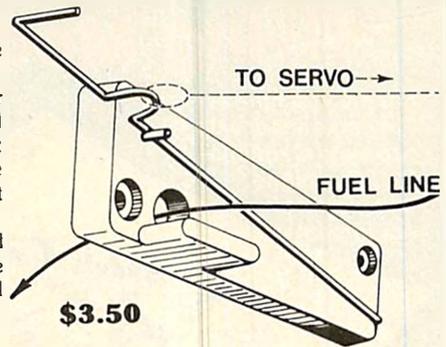
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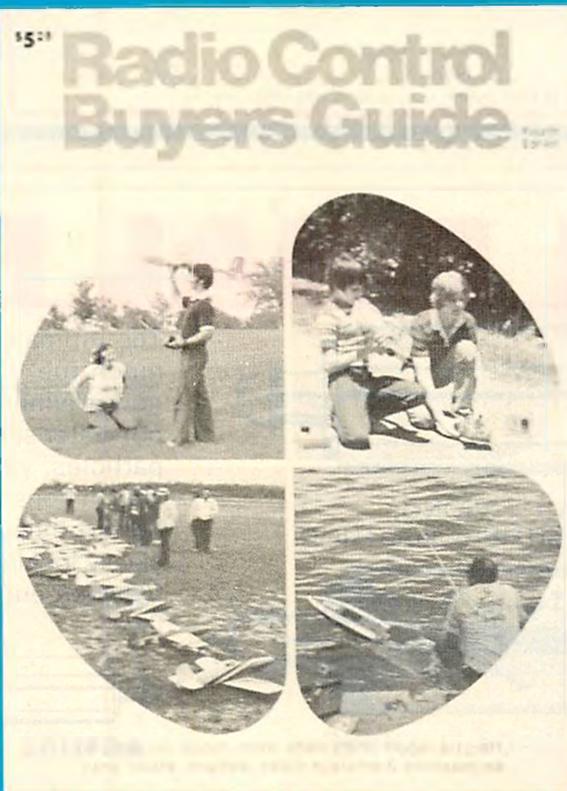


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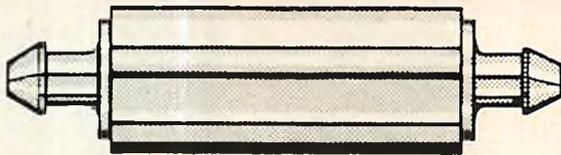
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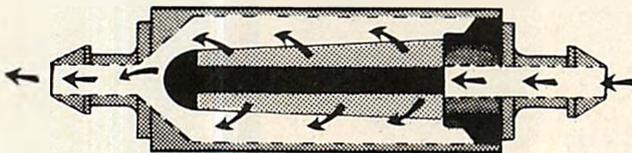
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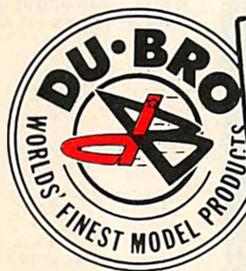
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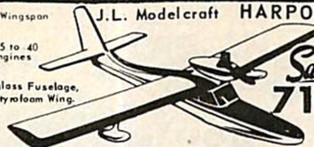


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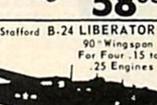
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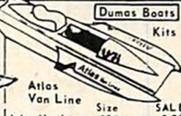
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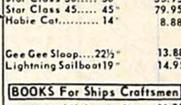
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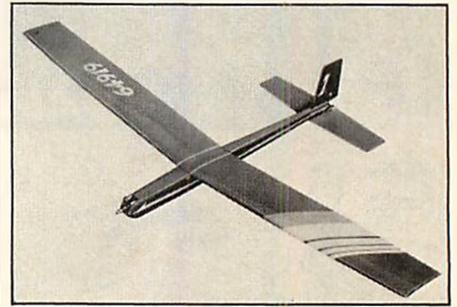
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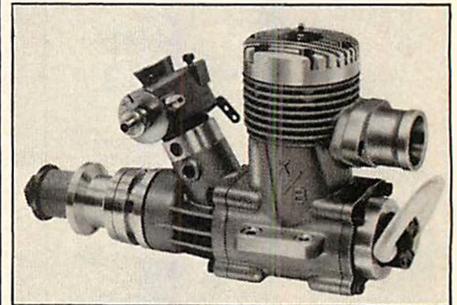
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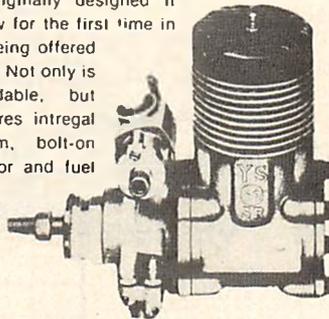
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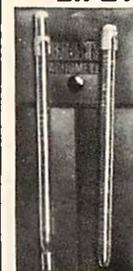
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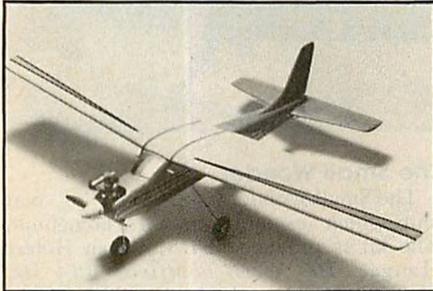
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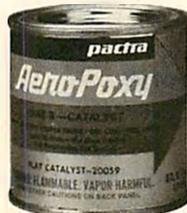


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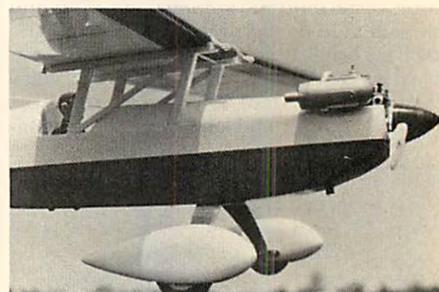
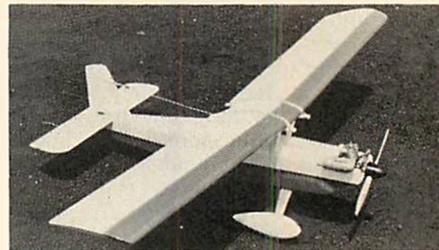
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FM Product Reviews:



The Small Wonder

The Small Wonder is a parasol wing sport ship which resembles an EAA homebuilt. The kit is produced by Michigan Hobby Hangar, 460 W. Broomfield Rd., Mt. Pleasant, Michigan 48858. It is designed for rudder, elevator and throttle control functions and engines in the .09 to .15 range. The length is 28", span is 46", area is 322 square inches and the target weight is 2½ lbs. The wing is a constant chord with a flat bottom airfoil.

Construction is all balsa and plywood. The wood is all of good quality and cleanly cut. Subassembly parts are taped together and marked as to their use. The hardware includes screws, horns, tailwheel strut and preformed aluminum landing gear. The rolled, full size plan is easy to ready. A comprehensive set of instructions is provided and steps can be checked off as completed. Several construction photos are included.

Assembly is conventional with a slab sided fuselage, sheet tail and a built up wing with leading edge sheeting and capstrips. Wood sizes for the fuselage are of substantial thickness, resulting in a very strong structure. The cabane struts are of plywood and are assembled to the sides while over the plan to assure correct wing incidence. The fuselage doublers lock the cabanes into position so they won't pull out later. All equipment is accessible through a large plywood hatch in the fuselage bottom. The designer intended that the fuel tank be mounted permanently, but I made it removable through the hatch. The equipment compartment is roomy, but the battery pack is a tight fit under the tank. Wheel pants are optional though their construction is shown on the plans. The wing is built on a flat surface. The spar cutouts in the ribs were too big. A strip of 1/16 sheet was used to increase the depth of the spar and fill up the slots. All other parts fit very well.

The wing was covered with Super Mono-Kote and Bridi striping tape. The fuselage and tail were painted with Hobbyoxoy. Plastic wheel pants were used to make that job easier. The engine used was an O.S. Max .15 with its muffler. A Kraft radio with three KPS-14 servos provided control. The finished weight was 2¾ lbs. Flying qualities are stable and gentle. Only a little down trim

JANUARY 1979

on the transmitter was necessary. Take-offs are straight and landing approaches are smooth. The aluminum landing gear is a little too soft and accounts for a bounce on most landings. It also bends if you hit too hard.

Overall, the Small Wonder is a good sport ship with great eye appeal. It is gentle enough for beginners too. At \$35.95 it is a good buy—RON FARKAS.



German Aircraft Markings 1939-1945, by K. A. Merrick, Published by Sky Book Press Ltd., 48 East 50th Street, New York, N.Y. 10022, Hardcover, 176 8½ x 11 pages, \$16.95

Do you know what the standard cockpit color was for all Luftwaffe front line aircraft during WW 2 . . . and why? How about the marked difference in aircraft camouflage and colors used on German fighters such as ME 109's (correctly listed as BF 109 in this informative volume) flown in action over water and, for example, on night combat missions?

This well-researched book offers the above information and much more on 176 pages covered with almost 300 excellent and varied photos, plus 39 charts and diagrams. Explicit text going into exact details will keep you reading to discover yet one more Luftwaffe camouflage and marking problem and solution.

It's a fact that after reading this museum-

style presentation you will never again run your eye over any military aircraft photo without paying close attention to all insignia marking and colors. There is much historic value, and interest, in correctly interpreting the marking codes of the various military aircraft and to realize their meaning and function.

An added bonus within this fine volume is what amounts to a mini-history of the Luftwaffe during the entire span of WW 2. Within the text, which describes the many aircraft markings, are the aircraft types and their actual combat assignments. The locations of Luftwaffe squadrons ranged from Spain during the late 1930's thru central European operations, the Air War over Britain, Africa, the Mediterranean, Russian and finally, the last defense of Germany and the air-space over it.

American ground combat troops reported a flyable American bomber, a B-24, in full Luftwaffe markings at the Salzburg, Austria airport during the first week of May, 1945. It was somewhat of a puzzle until reading page 119 of "German Aircraft Markings." The top photo clearly shows another American bomber, in this case a Boeing B-17F on active flying duty in the German Air-Force. The Luftwaffe markings and flying status are described in the text and one more minor mystery of WW 2 flying is revealed. Fascinating.

A short quote from the book itself may best sum up the total effort of this volume, "an essential addition to the bookshelf of the air historian, the enthusiast and the modeller." If authentic historic aviation detail is in your field of interest - then this book is for you—AL CHRISTEN.

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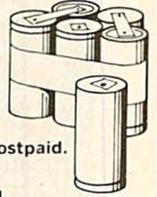


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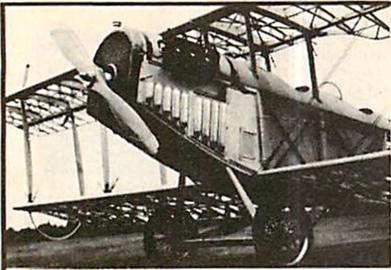
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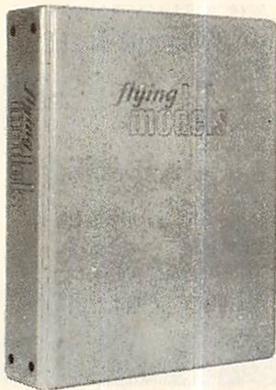


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FM Clinic

tips from the staff

Former Spacing

D.T.: I have an old model or two here with what looks to be malnutrition. With age the formers within cause the fuselage to bulge a bit and sag between former locations. Wouldn't it be better to have had additional formers spaced closer together?

ANSWER: Yes, it would, but very many modelers, kit designs and magazine plans have offered such aircraft. I guess it seems like enough for the designer at the time, he is concerned about weight and all that, but I personally prefer more closely spaced uprights, or formers, even if they are thinner in comparison to compensate. The same applies to stringers too. With built up sides if the uprights are not reasonably close exterior stringers will bow in in time due to the constricting pressure of the doped fabric. Even full scale aircraft are prone to develop longeron and stringer sag between bulkheads. They too are concerned with minimum weight, and cost, causing them to compromise somewhere down the line. If you plan a really glossy finish be particularly sensitive to your former spacing, the glossy finish will glare back at you with the smallest of faults.

Things Not To Do

H.L.: I just accidentally burnt up a rubber model by just touching a hot soldering iron to it when soldering something near the gear. Do you have any other such things not to do?

ANSWER: Can your oily rags. While it's winter now, oily rags cooking in the sun in a hot car are asking for it. Also, don't dry glue joints over an electric light bulb, it goes up in flames. Just ask me!

Bearings for Pushrods

A.L.: Sometimes a 1/4" sq. pushrod seems bulky and cumbersome. As a pushrod starts out as a length of wire and finishes as a length of wire reaching the horn is there any good reason for the balsa or spruce rod in-between?

ANSWER: Not really, except that the wooden pushrod offers a degree of rigidity. Music wire alone would flex under airloads, unless supported at several points along the length. You can use 1/16" dia. music wire, or

even a thinner size for a savings in weight aft of the C.G. if you bother to make a few "U" shaped wire bearings for it to pass through every few inches. Slip small lengths of spaghetti tubing over the ends of the "U" shaped wires to serve as roller bearings for the pushrod, and set the next one at 90 degrees to the first, locking the pushrod into a straight path to the elevators or rudder. This method works well within long slender wings such as a flying wing where you are trying to transmit the control motion to outboard surfaces. Your servo will thank you for it, the little lengths of plastic tubing rotating on the wire fairleads reduce the load on the servo and thereby prolong your battery life.

Ring Cowlings

D.A.: I can remember some big, beautiful spun aluminum ring cowlings offered for sale in hobby shops in years gone by. If such a metallic cowling cannot be obtained to fit a model do you have any suggestions as to how a comparable one can be made of wood?

ANSWER: Cowlings of this type can be fashioned from a few circular formers, sheeted with balsa and possibly 1/64" plywood, with the most forward area where it becomes rounded off turned on a wood lathe. Lacking such a lathe, a few circular rings of 1/4" balsa will do. The glue line within the laminations will help you visually as you trim and sand it to the final configuration. Once painted, an accurately made wooden cowling will look every bit as nice as the spun aluminum varieties.

As a final thought, you might want to flair out a last 1/2" lamination to simulate slightly opened cowl flaps. A few slits cut in will give the illusion of individual, moving cooling flaps. The hinge line should be scored as a definite line and the aft edges can be bevelled to a thin appearance and painted flat black on the inner surfaces. Better yet, really tunnel through where possible to create working air passages to help cool the engine compartment.

You might also check the pot department of your local store. Sometimes inexpensive aluminum cooking pots are close enough to cowl dimensions to be modified for the purpose.

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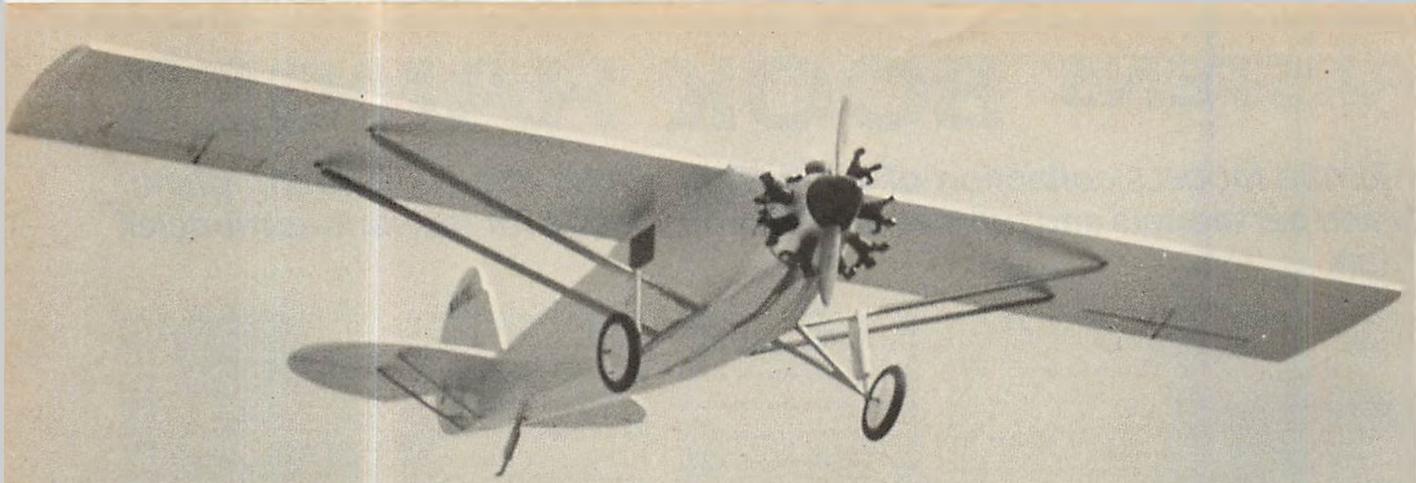
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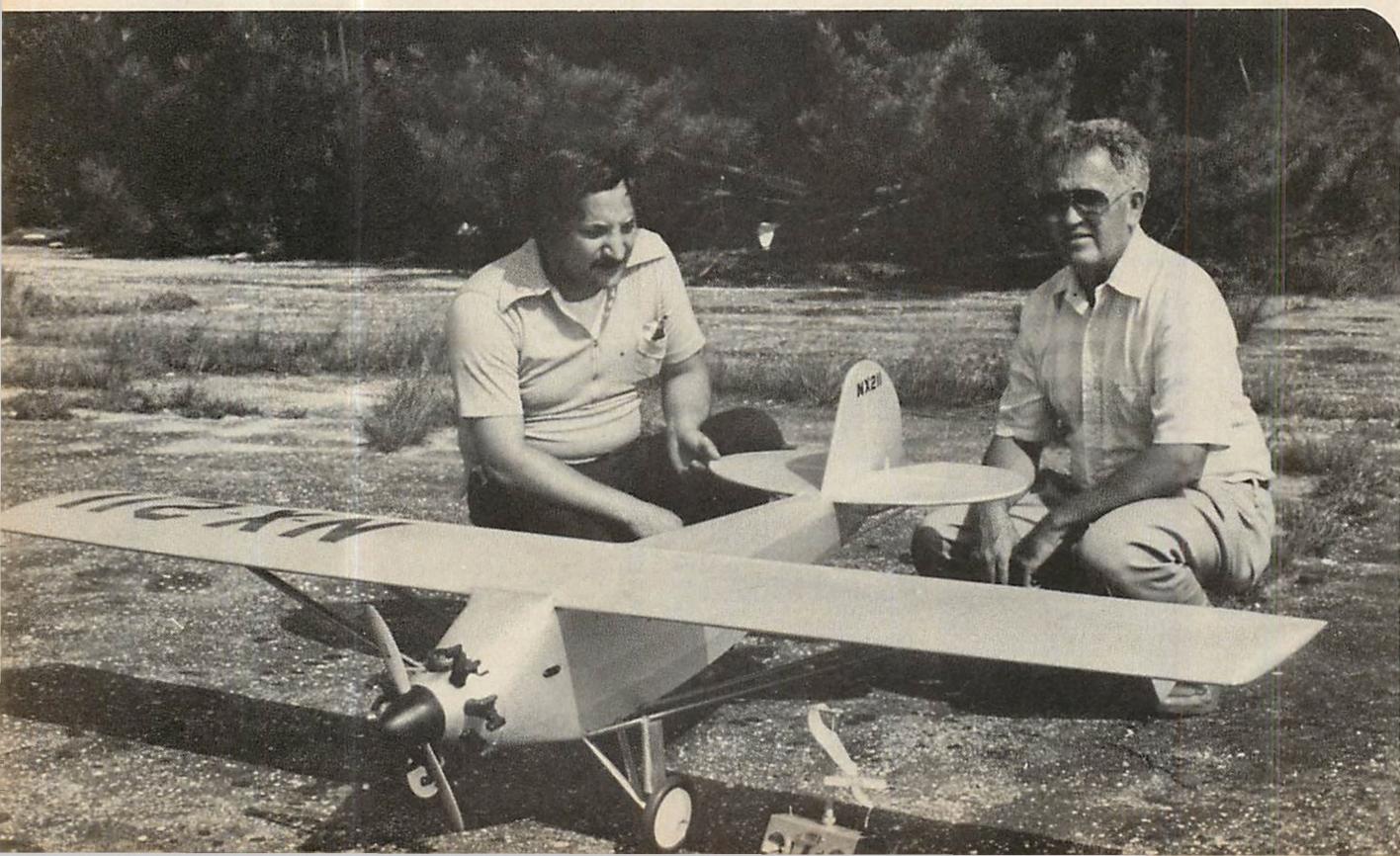
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A 93" wing, 14" chord, .40 to .71
power. It's big, easy and historic,
and can carry a gallon of fuel
for shore to shore hops/
Don McGovern and Tony Lombardo

PHOTOGRAPHY: DON MCGOVERN

Spirit of St. Louis



If ever a PR effort reaped full measure it was the naming of the Spirit of St. Louis. The bankers who backed the obscure aircraft are still receiving publicity for their fair city. Lindberg's flight spanned an ocean and shrunk the world to a new dimension.

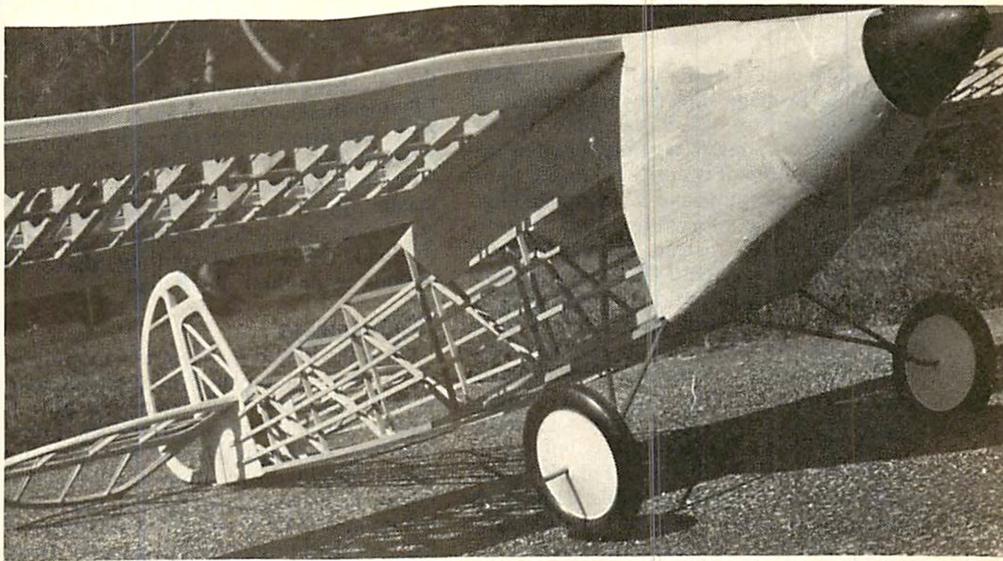
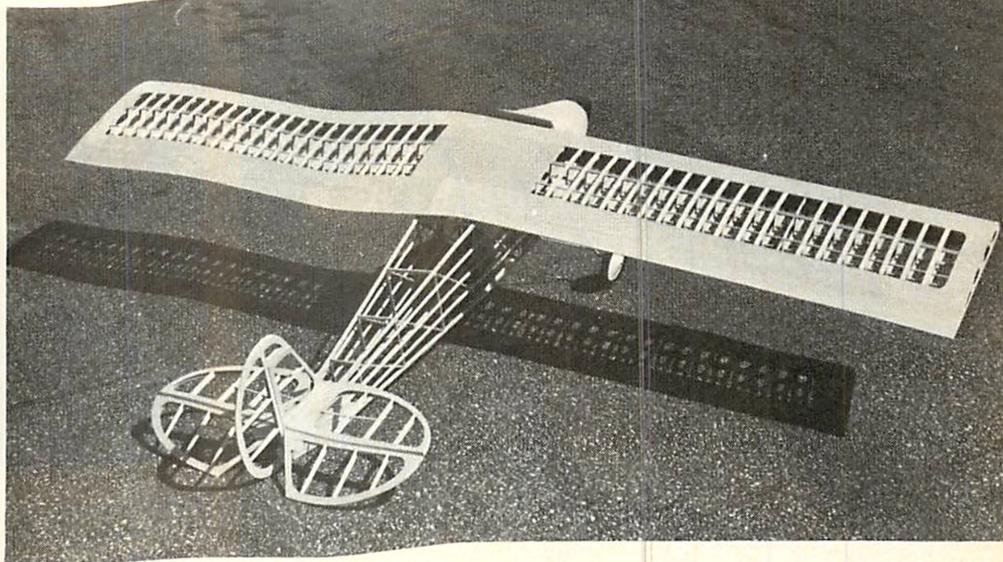
The year that followed sparked all kinds of interest in aviation and this very magazine first took root in 1928 as "Flying Aces". 50 years ago, which kind of inspired me to epoxy up a giant 2" scale replica. Now Long Island is of floating loose from the rest of the country, so I got to thinking about a ship big enough to take a full standard gallon fuel can square on the center of gravity. Enough suds to feed the terrible thirst of a glow-plugged .60, Long Island to Connecticut. About 20 miles of water. The plane might do it in half an hour, a couple of quarts would do, but the big problem is the chase boat. A boat has a hard time making it in an hour and an hour and twenty minutes is a better estimate. There is usually some very rough water to contend with.

Well, so far we haven't gotten that far. I started construction of this ship in 1977 and roughed out the basic framework, wings, fuselage, stab, fin, elevators etc., but a compelling family problem brought things to a complete halt and it became obvious it would be a year before I could get back to it. Tony Lombardo happened by and his eyes lit up. "Don, let me finish it up." It seemed like a wonderful idea. We decided to forego any thoughts of a nautical flight at this time as much would have to be done in waterproofing the radio, bringing our boat to the Sound side of the island (a 13 hour run and \$100 in fuel) and installing the fuel pumping system. Another season perhaps, the leaves are falling and the first snow flakes have already descended.

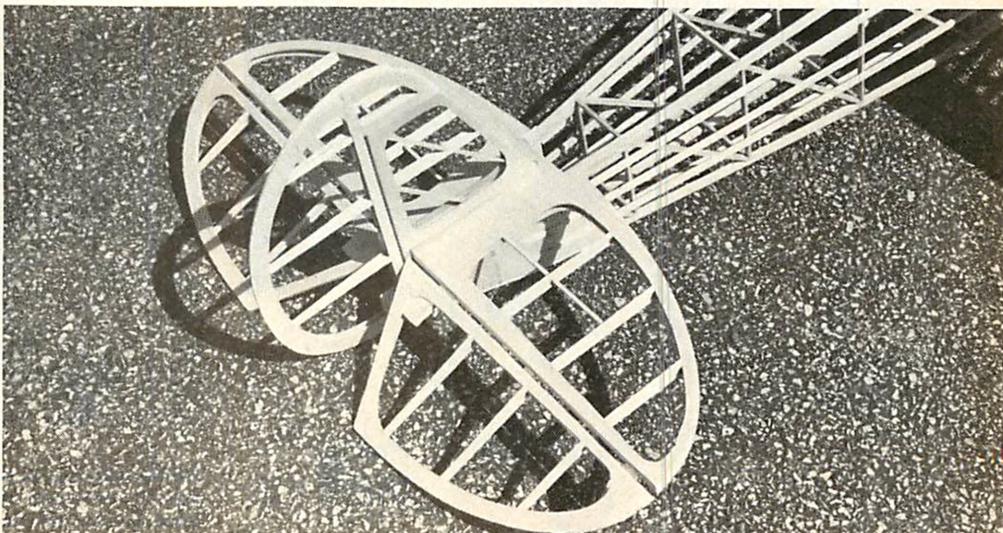
Tony has a thing for big aircraft, his DC-3 appeared in a recent issue of FLYING MODELS and he dug right in where I had left off.

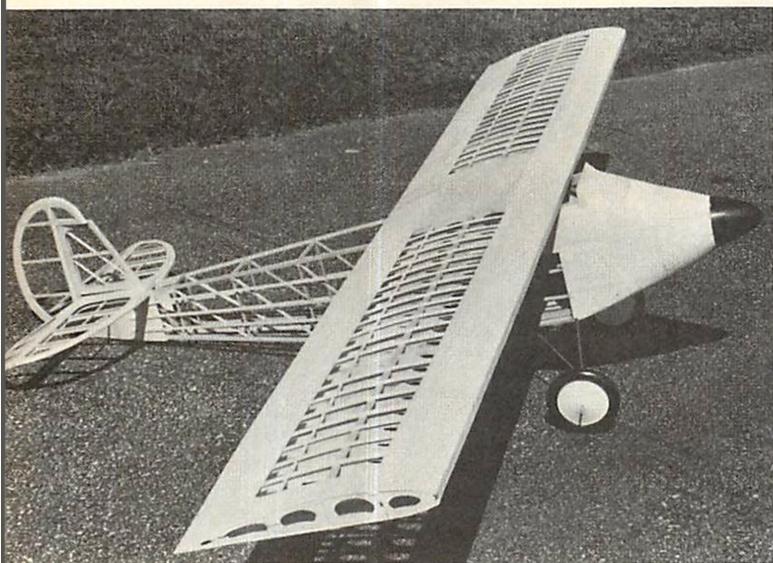
The Spirit of St. Louis was a great big flying gas tank. It had a Clark Y airfoil section capable of lifting the load. There was no forward windshield whatever, only a periscope and a view somewhat forward through the side window. An aircraft can be landed without such forward vision. Fly a crazed plexiglass windshield into a setting sun and you will use the side window too. Charles Lindberg's problems however don't bother the model much, we're not in it to look anyway. The model's tail surfaces have been enlarged somewhat to offer better stability and you can live with the absence of dihedral. Our ailerons have been increased in span one rib bay inward, but this is optional. The model seems to fly easily, comfortably, and I think it is almost a pussycat. The Clark Y section offers high lift and slow flight performance and the massive size gives you a good look and the time response to really fly the aircraft. Assuming you are moderately experienced in R/C, this aircraft is for you. While it is large, there is nothing difficult in the structure.

Williams Bros. offers 2" scale cylinder heads, exactly the right scale size. Also the wheels seen on this aircraft. They are of the correct diameter and closely approximate the type wheels used. We chose Flat Silver MonoKote for the covering, 5 rolls will do. It does a beautiful job, though you can silk it



A sturdy $\frac{5}{32}$ " double wire landing gear, 5" Williams Bros. wheels. The shot at the top gives you a look at the massive wing. Spruce spars and scale rib spacing. The longerons and main fuselage structure is of spruce, simulates the prototype's structure. **Below:** The empennage yet to be capped with sheet around perimeter, capstripped. It's light, sturdy, durable. **Facing page:** The 93" Spirit slides in on the first final approach. It performed very nicely from the first test, no nervous moments. **Lower shot:** Tony and Don grab a last photo before the testing. Tony finished up the basic framework just to see it airborne.





Eight feet of wing in a wind. "Hold it steady Tony, while I change film." If ever you wanted a big bird here's a good place to start. Always recognized. Left: Hollow ribs, light spars. Securely mounted wing struts carry the load.

and silver dope the aircraft if you wish. Wing spars and fuselage longerons are of spruce. It offers greater strength, it is almost warp free and longerons resist sagging between uprights. The aircraft is easily balanced, there is room for anything, and if you do not envision a gallon of fuel within, then there is room for a camera instead. This can be a real fun ship for you, a Stand-Off Scale that is just a big, easy box to build. You will find no plywood wing gussets as the wing is all in one piece. And there are no wing panels to join. The wing ribs were hollowed (optional) to allow for a few more drops of fuel weight, and the wing will appear during construction to be extremely flimsy. It is, but it starts to firm up with the final sheet planking and relies on the functional double wing struts for support rather than on massive wing spars within. As the struts are part of the scale appearance of the aircraft there is no need to incorporate great spar strength into the wing as well, it would be dead weight and cost you more bucks for nothing. Do tie

the mounting tubes at the fuselage longerons together across the fuselage with music wire, and firmly screw mount the struts to wing blocks so that the struts prevent the wing from folding. If ever at gross weight, maybe 7 lbs. of aircraft, plus a pound of tank and 7 more of fuel, the struts are holding a 15 lb. load. Given a 4-G pullout, that's 60 pounds, so do think about that!

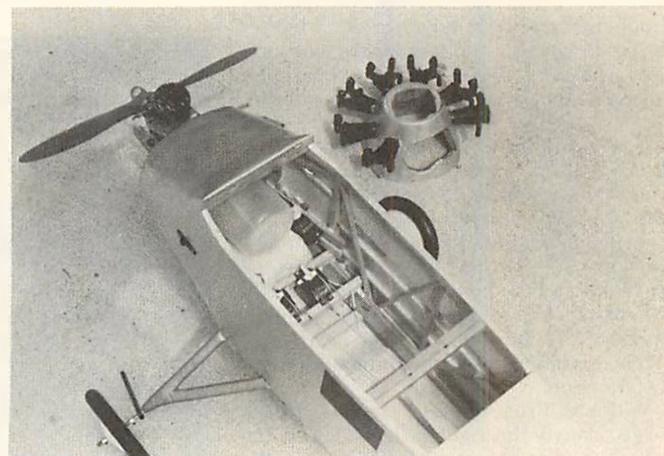
The Fuselage

Clear the bench again, cast everything to the floor. Lay the plan over a smooth area, tape the plan down, and Saran Wrap over it, taped to stay put. Epoxy splice $\frac{1}{4}$ " sq. spruce longerons to length. Drive a few finishing nails straight down along the longeron edges. Never pin or nail through the wood, always next to it. $\frac{1}{4}$ " sq. or $\frac{1}{8}$ " x $\frac{1}{4}$ " spruce is used for the uprights and diagonals, it may be epoxied or installed with a (waterproof) glue of your choice. With one side completed, lay Saran Wrap over it again, pressing the wrap down over the pins and finish-

ing nails. The second side is now built over the first for accuracy. The Saran Wrap will shield it from the epoxy so the two can be separated later on.

The two sides are joined in standard fashion. A temporary pair of sheet formers can be cut to hold the alignment. Sides are parallel through the cabin area, coming together easily as you move aft. The forward nose is harder, too sharp to bend. Zona saw it off, bevel for the toe-in angle and re-epoxy with the firewall in place. You will need some triangular bracing to strengthen the area. Secondary structure will be self obvious as you firm the structure up with stringers, cowlng blocks and the like.

The landing gear patterns are shown. Bend one each from $\frac{5}{32}$ " dia. music wire, easily bent. Bolt them securely into the structure and bind and silver solder the legs together. $\frac{1}{4}$ " brass tubing oleos pivot on the axle inboard of the wheels. These tie into the wing strut legs and simulate the real landing gear of the full scale ship.



The R/C is all but lost within the cavernous interior, Cables to the rudder and elevator work well. Radio should be full forward if a large tank is ever contemplated. Left: Nancy McGovern shows how a standard gallon tank fits.



First take-off. A short run and that Clark Y lifting section does the rest. Tail surfaces are enlarged enough to make it mild of manner. **Lower photo:** Balance it at 25%. More new ships are wiped out because of lead-like tails than fingers can count. No ballast in nose was required, just shift the radio about.

If you would like the option of a gallon tank of fuel on the C.G., your radio must go full forward into the most compact area possible, pushrods passing aft right against the fuselage sides. At the moment the original is rigged with cable controls and the radio would have to be re-mounted further forward.

As the fuselage nears completion, the wing is test fitted in place. Two 1/4" dowels peg the leading edge in and a pair of 1/4" nylon bolts lock the trailing edge down. The cowling area should be shaped out and sanded down prior to mounting the Williams Bros. cylinders. These eventually glue into position, but they are a little vulnerable if the tail is raised high as the lower cylinders then scrape the ground. Do look for any loose ones if you do touch them accidentally.

Wing Construction

It is assumed you are a moderately experienced builder for this size project, though

there is nothing hard about it. Start with a big flat bench. Tape the plan down, trace off the opposite wing panel flopping it for the image. Lay Saran Wrap over everything, taped to the board. Splice up four foot lengths of 1/8" x 3/8" spruce for the wing spars. 5-minute epoxy will suffice for this, it's all I used.

That's a lot of wing ribs, scale rib spacing, so blame Ryan. Try it my way and it will only take two hours and you won't need a sanding block. Take eight sheets of 1/16" x 3" x 36" balsa. Run a line of Ambroid across each, every 2". Place one upon the other for eight sheets lightly tack-glued together. Top sheet gets a coat of rubber cement. Next trace the master rib pattern very, very accurately seven times, within a 3" x 36" area. (You'll need a second such sheet stack.) This seven rib paper pattern is now coated with rubber cement on the underside also, pressed onto the stack of eight sheets. It will look like a homemade die layout. You now feed it into a Dremel Motorsaw, starting by cutting into

workable sized blocks of ribs to be. First trim to leading edge end, then from the leading edge cut the top camber. Next, from the leading edge cut the bottom camber. Do not vary this. If the saw blade is not perfectly aligned to the table, returning from the trailing edge end would double the degree of error. Notches are next, easily cut. The pattern shows how ribs can be hollowed (optional) without removing, reinserting, removing saw blade countless times. Glue drops later bind up the blade line. Once a stack of eight ribs are cut, peel off the paper pattern, discard it, then rub off the rubber cement with your fingertip. You can then slip a razor between the sheets to pop off a perfect rib. Two hours start to finish for all those ribs. It's a fast way to go, done neatly there is nothing to trim. You should end up with a couple of spare ribs. The same technique will cut your stab, elevator, fin outlines, formers, firewall, countless other modeling parts. I can't understand why more builders don't use this technique.

I think most of the rest of the wing assembly is pure routine. It will seem very weak as you start to assemble it, as mentioned before, but don't let this discourage you. It ends up stiff as a plank when covered and screwed to the struts. The plan drawing will reveal just about all you need to know and there is no exact order of sequence, just do it, it flies rotten without the wing.

The Tail Surfaces

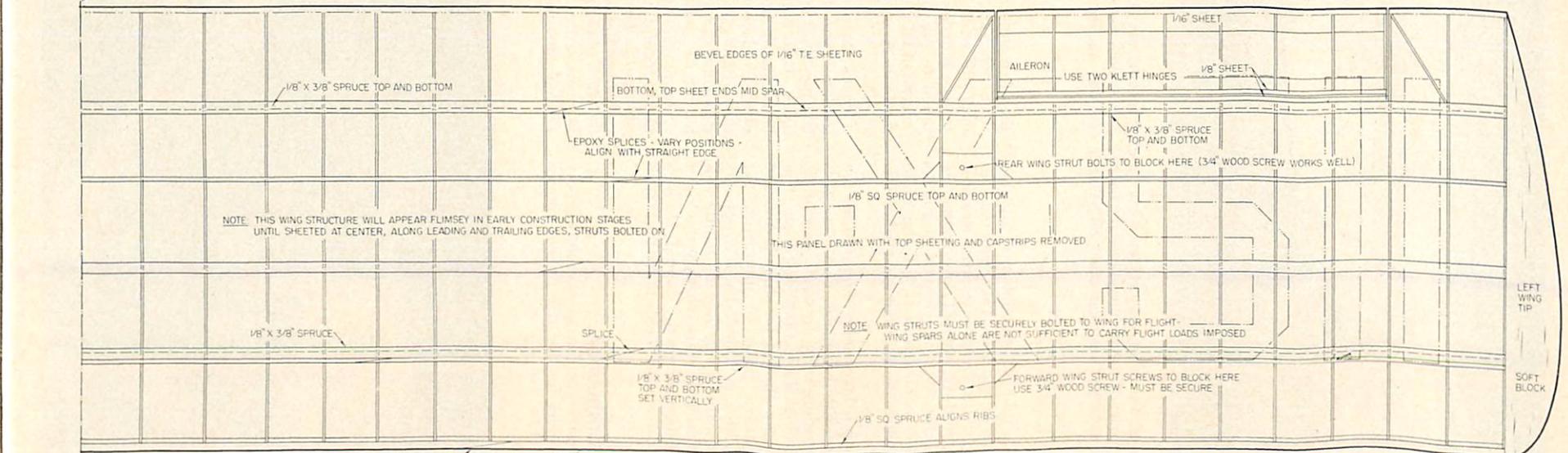
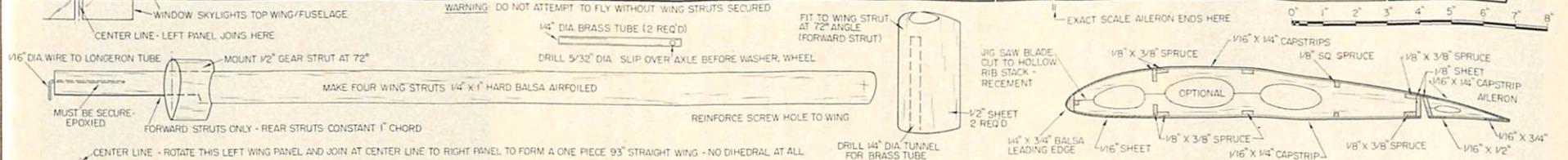
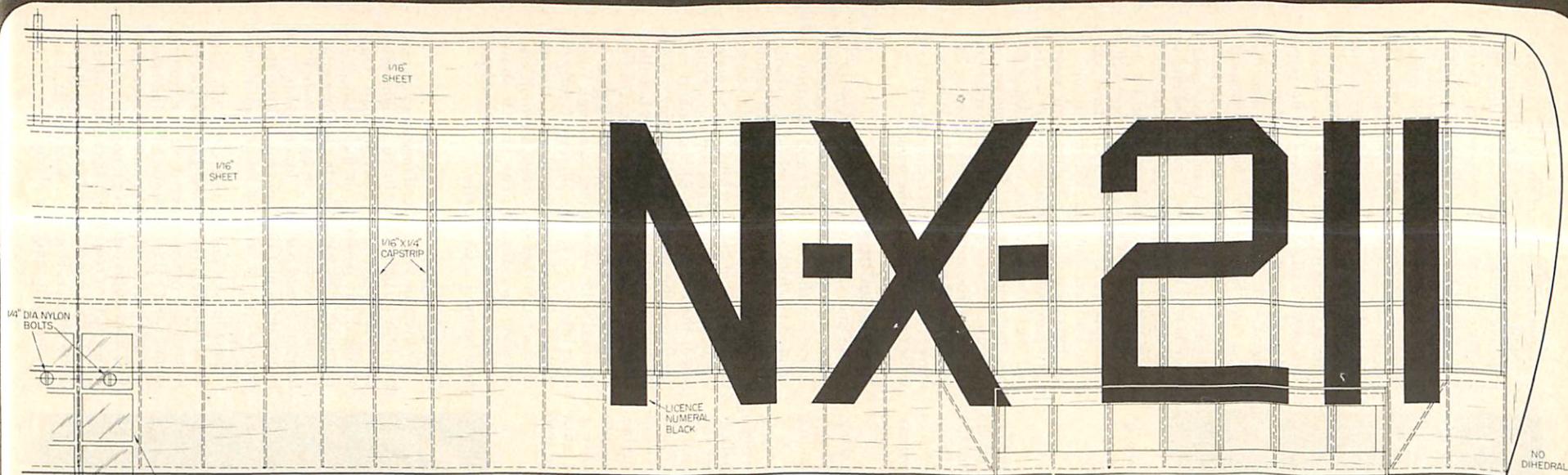
The stabilizer has a central core of 1/4" balsa, cut to the curvature seen. Later it is capped with 1/16" sheet, and capstrips to create a 3/8" thick surface. The fin is similar. Hinges are epoxied between two laminations of 1/8" x 1/4", each razor shaved to accept the thickness of the Klett hinges. This makes it easy to install the hinges and almost guarantees their alignment. Elevators and rudder follow the same idea, but taper toward the trailing edge, requiring just a bevelled edge on the sheeting as it meets. Do precisely a slot wide enough for the hinge to be inserted (with epoxy, after covering). You'll need hinges too for the ailerons. Neatly install all control horn mounts, the elevator crossbar and the like. Screw them on after covering and doping. The aircraft shown was rigged with cable controls, but pushrods may be used if you prefer.

Flying Notes

By the time you get it all together you may be a little up tight for the first test flight. If so, the local expert may be your man. Ours checked out perfectly in the balance department, 25% back from the leading edge. If a ship is tail heavy it is an accident about to happen, so add ballast or do something. Tail heavy ships just don't get up and fly, they respond poorly, and too late to radio commands.

Start up your engine, test out the idle, fuel feed, throttle advance and general smoothness of the power. Take it off in a straight manner and hold it to gentle climbing turns. Throttle back to whatever seems reasonable. The final approach can be made power on with a modest rate of sink. It's an easy bird to fly. Do fly it carefully and try to keep it clear of the pit area. Hope you reach the far shore one day, and send us a photo.



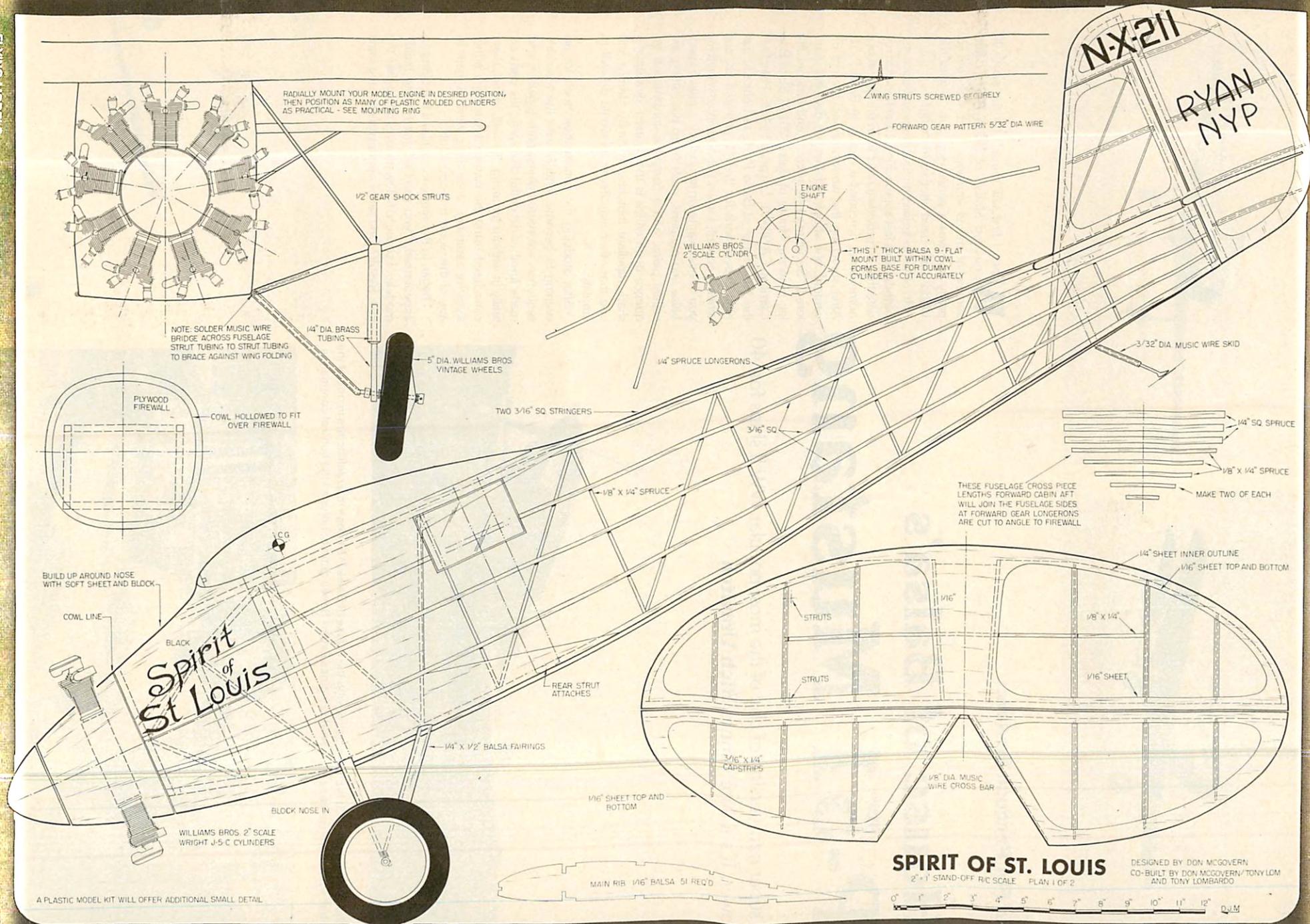


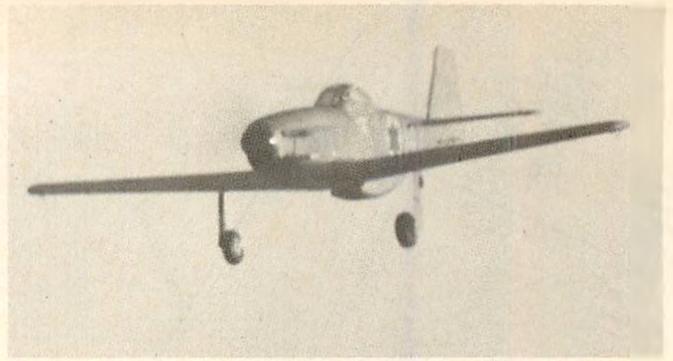
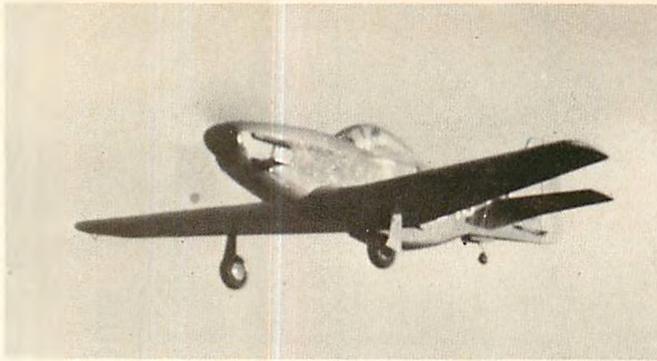
WING IS ALL SILVER - MONOKOTE FLAT SILVER (5 ROLLS) COVERS MODEL

LEADING EDGE IS TRIMMED FROM 1/4\"/>

NOTE: "CLARK Y" AIRFOIL, LARGE SPAN, AMPLE AREA, LIGHT STRUCTURE ALLOWS THIS AIRCRAFT TO LIFT LARGE FUEL OR CAMERA PAYLOAD

SPRIT OF ST LOUIS - PLAN 2 OF 2





An FM Product Review:

House of Balsa's P-51 Mustang

A super new version of one of the most popular WW II ships for .40 power. It's a sure winner/**Rich Uravitch**



Author Richard Uravitch is shown below with the House of Balsa P-51 done in Israeli colors in one of the neatest workshops we've seen. A World Engines Expert Series radio handles all the control commands.

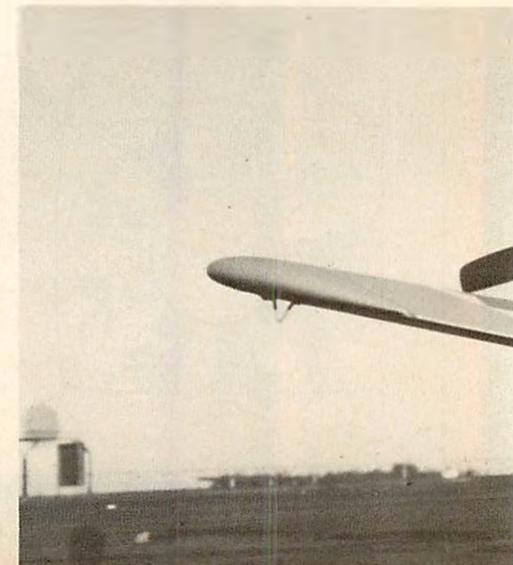


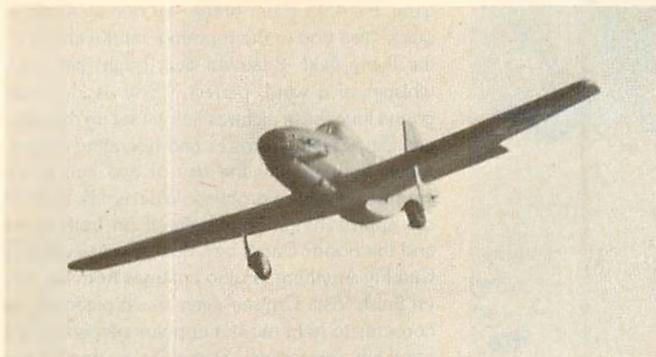
When I first saw the ads for the new, .40 powered House of Balsa P-51, I had somewhat mixed emotions . . . it sure *looked* pretty and was a perfect size but . . . does the world really need another Mustang?

In order to answer my questions and since my birthday was fast approaching, I mentioned to my wife that, to provide a relief from the chores of a homeowner, I *needed* a House of Balsa P-51. After surveying the workshop and present inventory, she shook her head in disbelief, muttered "So what's one more?" and ordered the kit, from the House of Balsa, 20134 State Rd., Cerritos, CA 90701. List price \$54.95. I had built the 1/2A House of Balsa P-51, so I already had high expectations for the .40 powered kit, and when it arrived, I wasn't disappointed. Anything you've ever wanted in kit quality . . . plus. Superb balsa and ply parts, razor sharp die cutting, excellent plans, and a complete construction sequence book which is the greatest idea since a shark repellent franchise in Amity Harbor and one that other manufacturers would do well to emulate.

After studying the construction book for an evening to become familiar with the assembly sequence, we started gluing parts together, and made another delightful discovery, the parts actually fit without trimming. So well, in fact, that I considered using the cyanoacrylate type adhesives for assembly, since there were no gaps in any of the wood to wood joints.

I began in the sequence outlined but being an experienced, "you can't tell me how to build" modeler, I chose to follow pictures rather than the text. Result? One set of upper surface wing skins





that I later had to cut apart at the seams to allow them to be attached to the wing structure as required. Moral? Read words along with studying pictures. After this lesson, the balance of the wing construction proceeded smoothly.

The fuselage construction is very straight forward as it is built inverted, directly over the plans to assure accurate alignment. The entire upper portion of the fuselage from the nose block aft is a one piece, vacuum-formed clear plastic section that is built over a balsa substructure and attached to the basic fuselage box. Very clever, and very reminiscent of the House of Balsa 1/2A series which used the same approach. The tail group is solid 3/16" balsa sheet which needs only airfoiling to complete.

There are a number of clever touches in the kit in addition to the formed upper fuselage. One of these is the steerable tailwheel mount which provides not only a bearing for the strut but creates the illusion of tailwheel doors when mounted in the scale location rather than being hung below the rudder. The method of actuation for steering purposes is off a separate pushrod, a method I've long preferred since it eliminates the possibility of tailwheel load being transferred directly to the rudder.

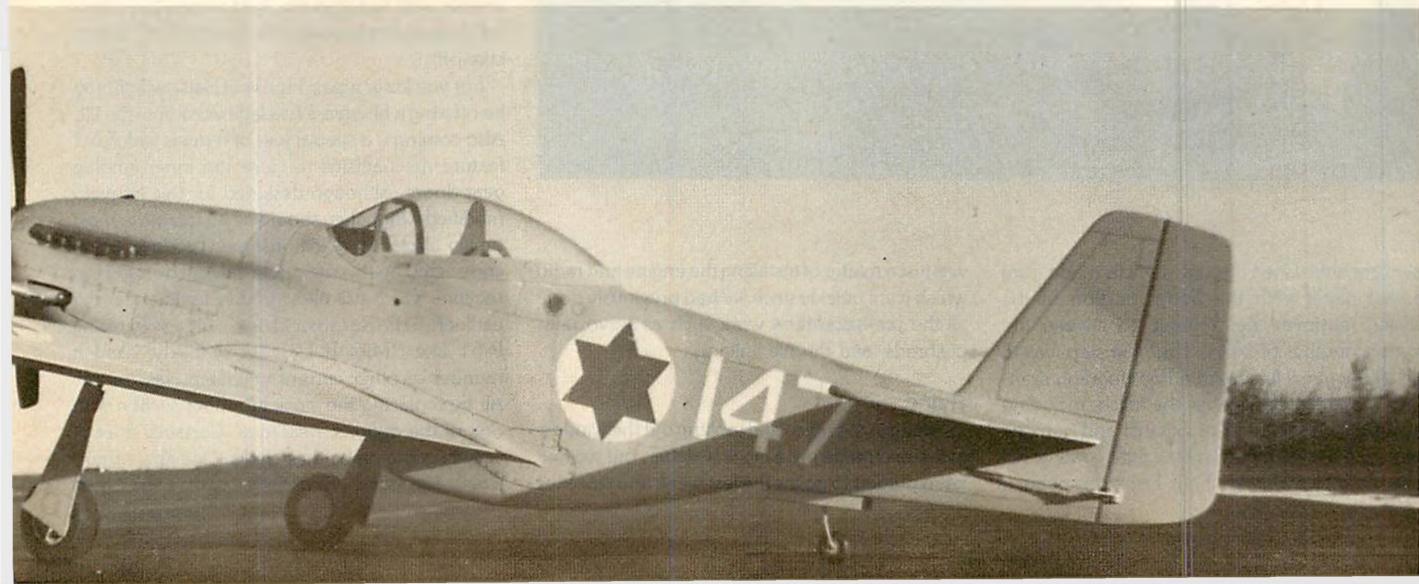
After the basic woodworking has been completed including carving the nose blocks to fair into the 2 3/4" spinner, the entire airframe is smooth sanded in preparation for filleting. House of Balsa provides card stock templates for the wing to fuselage fillets. These are attached to the wing saddle area, the wing center section temporarily covered with waxed paper, and the wing bolted into position. A batch of fairly runny

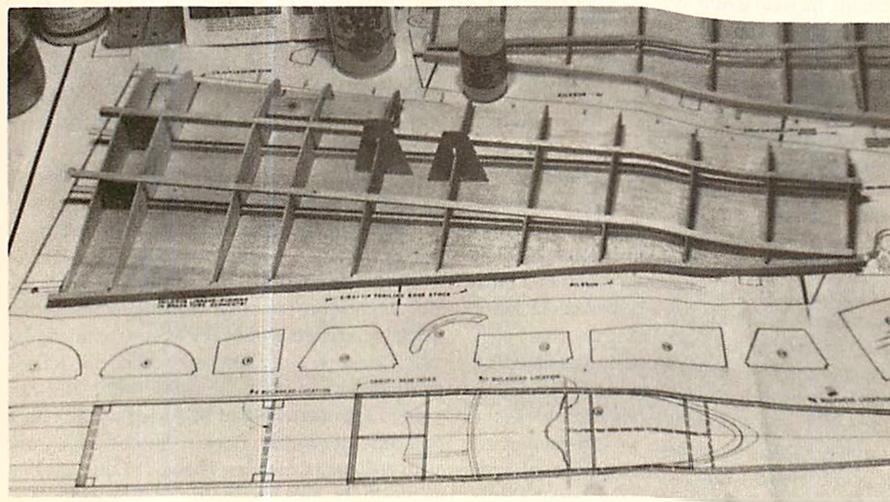
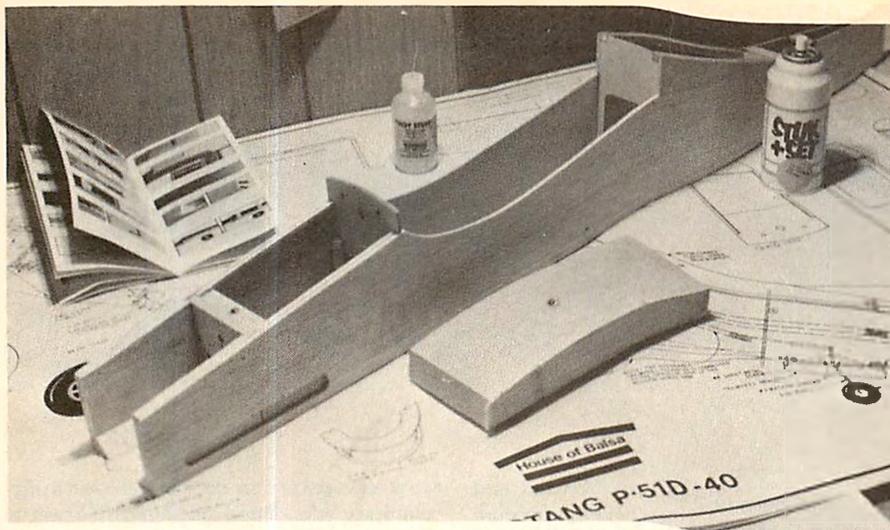
resin/micro balloon mix was prepared and poured into the fillet area. Just before the mixture is cured, the wing is removed and the fillets rough shaped. Final shaping/sanding takes place after full cure. The card stock base minimizes the wing to fuselage gap and creates a better appearance than a plywood or balsa base. The same consistency micro balloon mix is used to develop the tail group filleting.

Since we were planning on putting an Enya .40 in the '51 and the airframe, at this point, was very light, we decided to apply a fairly decent finish since weight was of no real consideration. When it comes to finishing, everyone really has their own favorite method. I'm no exception, however, I try to tailor the finish based on what I plan to use the airplane for. My Mustang was slated for small field, fly everyday operation so I decided to trade some overall super finishes for a little extra durability. Decision made, we proceeded to cover the entire airframe, less tail group, with Silkspun Coverite. For those of you familiar with the iron-on type coverings, either fabric or mylar, I'd like to point out here that I coated the raw wood with Balsarite. This material is brushed on and allowed to thoroughly dry before applying the covering. It adds virtually no weight but increases the bond of the material to the wood tremendously. The long term advantage is that it nearly eliminates the tendency of the covering to creep or lift, especially on the 90+ degree contest days on the flight line. A note of caution, as with any material of this type, apply either outdoors or in a well ventilated area lest the vapors affect thy head and you end up with an airplane decidedly different than designed. The Coverite was given

two coats of uncut clear dope and allowed to dry completely before lightly sanding with 320 wet or dry sandpaper. This step is not essential, but helps to eliminate the "fuzzies" or raised weave before applying two medium coats of acrylic auto primer. Lightly sand with 400 and apply an additional wet coat if required. The ailerons, lower cowl block, and all the empennage components received two coats of resin directly on the sanded, raw balsa. After curing, the resin was sanded to a smooth finish.

You should now be ready for color coating . . . we were and this is where the longest lapse in the project occurred. You'd think that with all the documentation available on the Mustang that selecting a scheme would be as easy as taking 1st place in a one entry contest. Not for me, folks. I narrowed it down to a military finish but discarded the natural alclad because I would rather take one of Frankie Tiano's castoffs than work with silver paint. Besides, I haven't found any that really looks like aluminum and provides any semblance of durability. Since I had done a .60 powered P51 finished in O.D. and grey ("Tangerine") about five years ago, that one was out. We finally came up with the choice after looking through an Arco-Aircam volume covering Mustangs used by foreign services. There it was, resplendent in its tan, grey and light blue scheme, an Israeli P-51. The scheme struck me as interesting, unique and most importantly, easy to duplicate. A quick phone call to Tiano provided me with the quantity of RS Camouflage colors that I needed . . . even if the cans Frank sent were half empty. This paint covers so well, I returned 1/4 full cans to Frank. The national insign-





The construction methods used on this .40 powered version of the H of B P-51 is the same as is used on their famous 1/2A kits (top and above). It's simple and foolproof and the end result is solid and strong.



nae were airbrushed through stencils made from contact paper with the better portion of the "sticky" removed by running it between the hands a number of times. The next step was to add all the panel lines with a Rapidograph drafting pen and lightly weather the finish, including the airbrush application of exhaust and gun gas staining. This was followed by 2 light coats of RS Satin Clear to seal everything. From this point, it

was just a matter of installing the engine and radio which went quickly since we had previously done all the pre-installation work such as servo rails, pushrods, and throttle linkage.

Flying

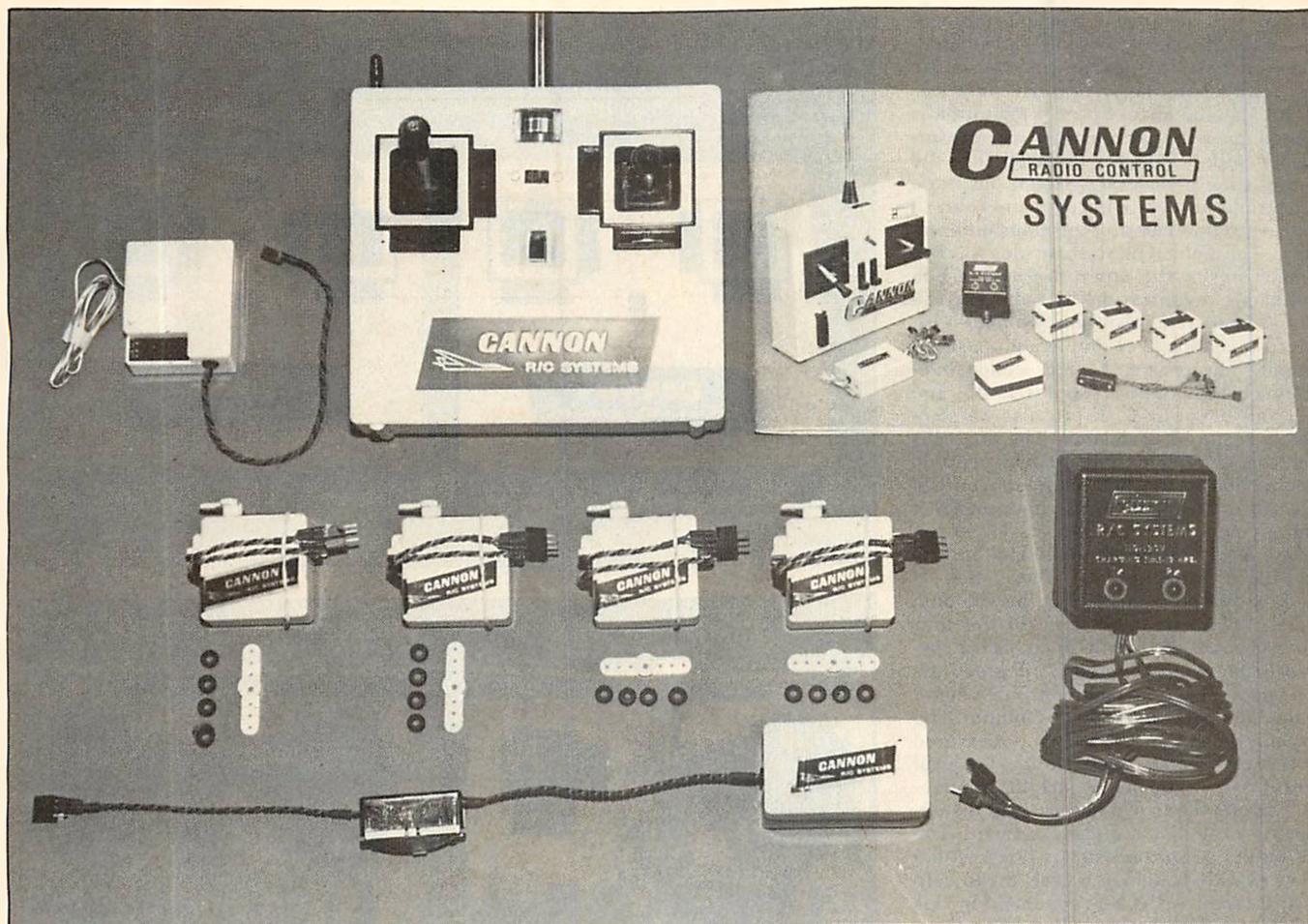
Sitting in the office and looking out the window at the rain made me a clock watcher, but we had been primed to go for the last week and since we

didn't have floats, we remained grounded. Okay gang, it's 4:45 p.m., breeze by our secretary, a quick "see you in the morning" and were off to the flying field. Beautiful day, bright blue sky, whisper of a wind, perfect. "Boy, is Hoeckele gonna love these pictures" as we set up the camera. Since taking pictures and operating a transmitter both require the use of two hands, we surmise we have a problem. What is this, another car approaching? Stars painted on both doors and the hood? Can it be? Yes, yes, it is. Jerry "I Can Fly Anything" Puleo emerges from his desert finish Vista Cruiser. After much pleading, he consents to help me but appears perplexed as I hand him the camera. Somehow he doesn't understand. Grabbing my transmitter calmly, he remarks, "start the engine."

All goes well as the K&B .40 whimpers to life (it used to bark but with as much time as I've got on it, I'm grateful it accomodates me by running at all, those engines really last). A quick control check and we line up on the runway, advance the throttle and go. The tail comes up almost immediately and the '51 runs on the mains for about 50 feet and lifts off cleanly. The entire flight was a bit erratic and we estimated the speed at about 70-75 m.p.h. I had set the ailerons and elevator for more throw than recommended, and it was obvious as minimal stick input turned the bird into a pylon racer. The approach and landing were uneventful and the airplane can be slowed down to a very low approach speed without exhibiting any tendency to fall out of the air. Dead stick approach will result in a sink rate equivalent to a loss of approximately 20 feet of altitude over a 300' length.

We reduced the throw on both the ailerons and elevator to about 1/2 of what we had, added 1 1/2 oz. of nose weight to further reduce pitch sensitivity and tried again. This time, the airplane performed beautifully, very smooth and excellent tracking. The only recommendations I would offer would be to: 1) bend the main gear struts forward approximately 3/4" which will reduce the tendency to nose over during take-off and landing and 2) the CG shown on the plans should be considered the aft most location, 1/2" forward will buy a bit of insurance for the first flights and 3) observe the recommended control surface throws. All in all, this kit is outstanding in all respects. If you have previously built any House of Balsa kits, you already know what to expect. If you haven't, by all means, try one. You won't be disappointed. Any flyer who feels comfortable with a .40 sport pattern ship shouldn't have any trouble with this airplane. Just remember, it is a tail dragger and shouldn't be "horsed off" during take-off.

For you lazier types, House of Balsa will shortly be offering a fiberglass fuselage version of the kit. Also coming is a special pair of retracts which will feature mechanisms to close the inner landing gear doors. Although designed for this kit (with modified wing), they should be adaptable to most similar airplanes. Additional new products being considered are two alternate vacuum formed top sections which will allow you to build either the earlier P-51B (Razorback) or the ultra sexy racing P-51 like "Miss R.J.", "Foxy Lady" and a number of other current unlimited class racers. All by replacing the stock kit upper section with one of the options, neat idea. Certainly a lot of activity going on by these folks. One final rumor, a very aerobatic, .40 powered sport scale . . .



PHOTOGRAPHY: BOB ABERLE

An FM Product Review:

Cannon Electronic's Mini-Sport R/C System

Cannon's interesting new "economy" system still offers many options. Dry batteries or rechargeable, sub-miniature servos and 100 mah battery packs. It can be upgraded later from two channels to five. It's also offered in kit form/**Bob Aberle**

The name Cannon Electronics has been associated in recent years with very small, compact radio equipment. Back in 1976 Bill Cannon introduced his Super-Mini system with an airborne weight of only 5.0 ounces (with four servos). That particular system was reviewed in the January 1977 issue of FLYING MODELS. I'm sure Bill would like the R/C flyer to know that he also offers a complete line of equipment including his full size custom built Grand-Prix series.

This past year Cannon Electronics, like so FLYING MODELS

many other R/C manufacturers entered into the so called "Economy Class" equipment line. The usual marketing theory here is to limit the systems options, offering a single radio package at an attractive price. The new Cannon Model 810 Mini-Sport is economy priced, but still offers some interesting options which I will discuss later in this review.

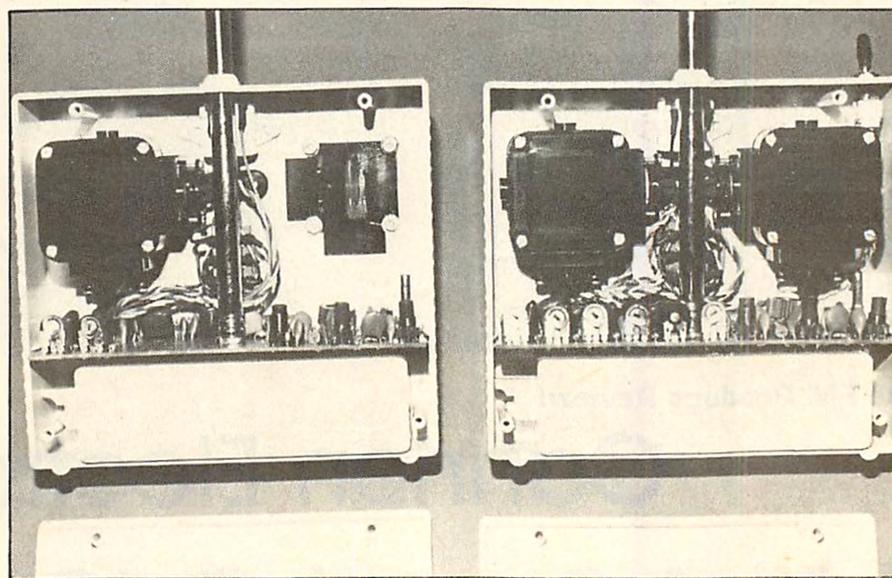
My particular evaluation radio was designated as a Mini-Sport deluxe system (Model 810D-54A) which has a list price of \$259.95. This system specifically includes: a full five

channel transmitter with nickel-cadmium rechargeable batteries, a five channel receiver, four type CE-4 servos, a nickel-cadmium airborne battery pack, dual output charger, an assortment of servo hardware, servo trays and an instruction manual. Although my system came with a dual stick transmitter you could obtain a single stick (3-axis) transmitter on the four or five channel model for an additional \$15.00. As is the case with all Cannon systems the basic price includes frequencies on either the 27 or 72 mhz bands. For an additional \$10.00 fee

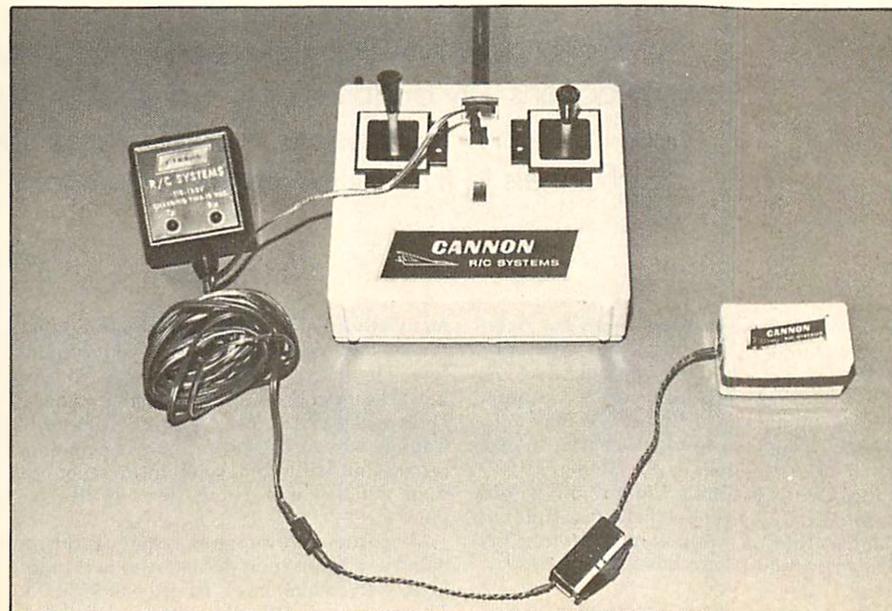
Cannon will also make available frequencies in the 29, 35, 40, 53 and 60 mhz bands. Some of these frequencies, of course, are only legally permitted in foreign countries.

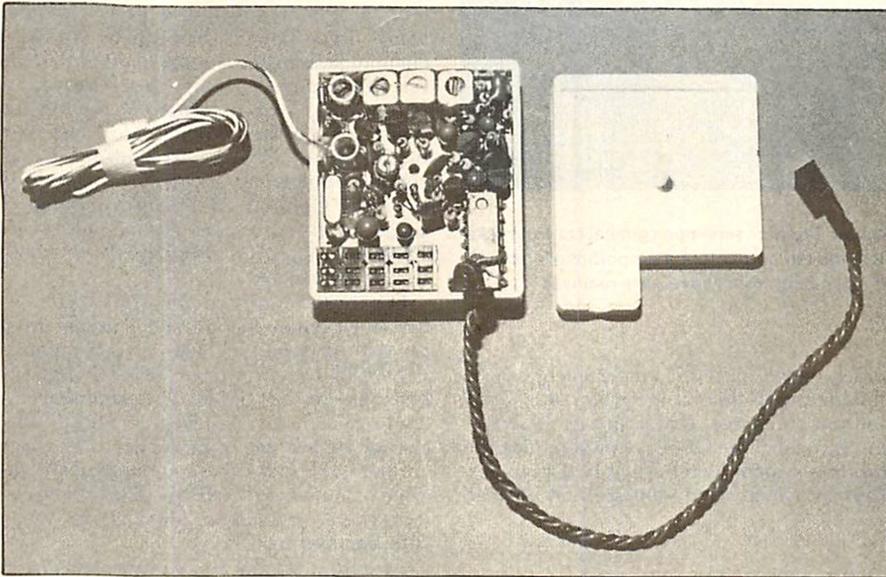
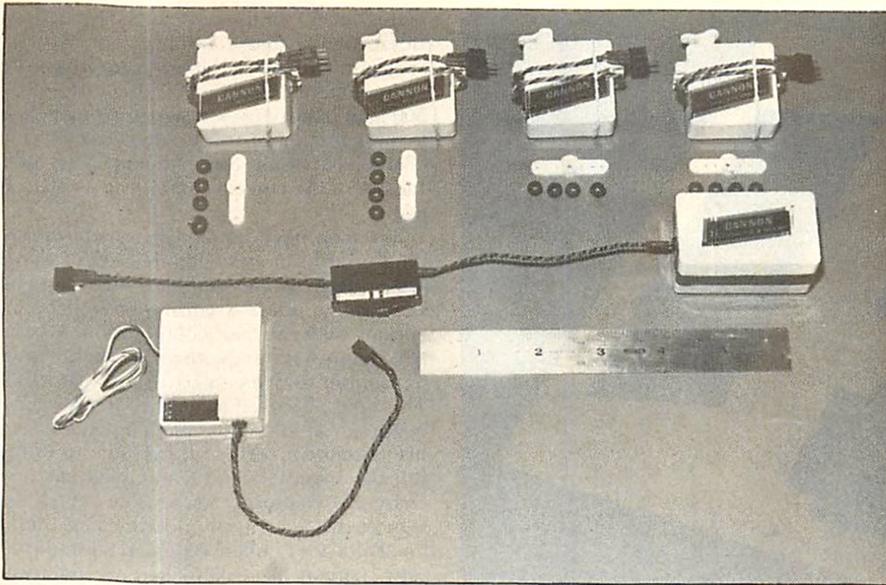
The Cannon Mini-Sport transmitter is housed in a white ABS plastic case measuring 5 $\frac{1}{2}$ " wide x 5" high x 1 $\frac{3}{4}$ " thick (less the control stick projections). Sketch out those dimensions on a piece of paper and you will realize just how compact this transmitter really is. The molded plastic case idea was Bill Cannon's using the expert facilities of Bob Dunham's organization in Lake Havasu City, Arizona. The resulting two piece custom case is attractive, simple and most important, inexpensive. A nine section telescoping whip antenna extends to 48" and collapses down to 4". It can also be completely removed, if desired. The dual axis Dunham semi-open gimbal sticks need no introduction to the R/C modeler. You can adjust the stick length to a maximum of 1 $\frac{3}{4}$ " if that is your preference. Once you get the correct length just apply some Hot-Stuff to hold the stick tip in place. These stick assemblies employ the CTS type 5K ohm ceramic element pots. Each of the four prime channels has a trim lever. These levers each provide a generous 22 degrees (+/- 11 degrees) of vernier control (trim). A meter on the front panel monitors R-F output. The output is quite high, by the way. I measured it at 700 mw, which is very close to the legal limit of 750 mw (on the 72 mhz R/C frequencies). Inside the transmitter case all the circuitry is located on a single P/C board. The R-F output stage transistor is fitted with a heavy extruded aluminum heat sink to help dissipate some of the heat generated by this high powered transmitter. On my five channel transmitter a retract switch was located on the top left corner of the case. This is strictly an on/off type control and is not proportional. Although the dual stick four and five channel units are supplied in the Mode II configuration you can order Mode I from the factory at the time of your purchase. Since I had a deluxe system, my transmitter came with a set of eight (9.6 volt nominal), 500 mah capacity, nickel-cadmium rechargeable batteries. These batteries are of the A-A pen cell size and are manufactured by G.E. They are located in a battery case directly below the P/C board. A charging jack (Deans three pin with key) is located on the front panel directly above the power switch.

Next item is the Mini-Sport receiver model 520R. It is housed in a white molded nylon case measuring 1 $\frac{9}{16}$ " wide x 1 $\frac{3}{4}$ " long x $\frac{3}{4}$ " thick. My five channel version weighed approximately 1.3 ounces (the two channel version weighs only 1.15 ounces). Deans three pin (gold plated) connectors are used throughout. I like this type connector since you can do your own soldering when it becomes necessary. Five connectors are attached directly to the P/C board in a block type configuration. Servo cables plug directly into the receiver case. The power connector is a male type. All the servo (channel) connectors are female type. A single cable (6" long) exits from the receiver case. Surprisingly this is the fifth channel connector, not the aileron connector as you might expect. My receiver idled at 10 ma which is a low idle and is mainly attributed to the use of a C.M.O.S. 8 bit shift register I.C. (type MM74C164N) in the decoder. Eight channel capability is available in this receiver, but not the transmitter. The speci-

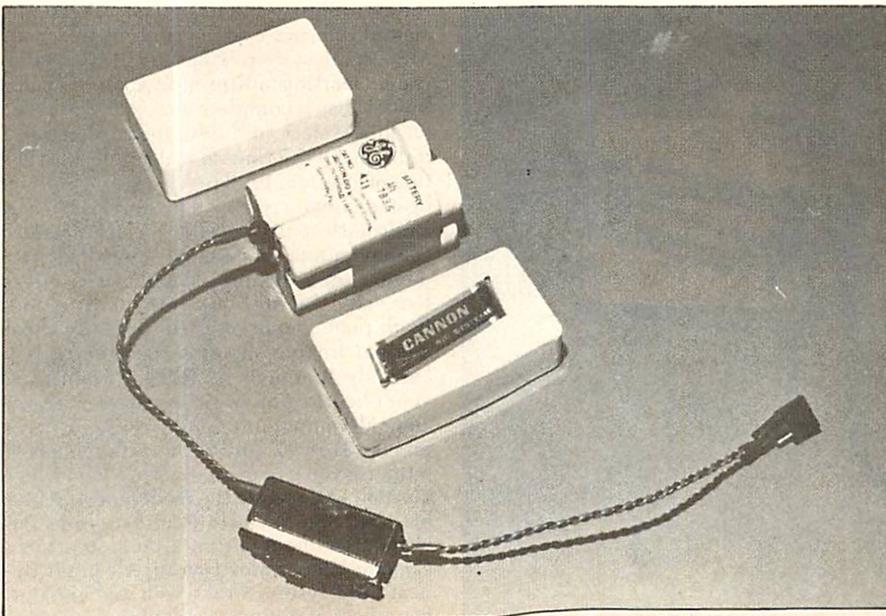


Inside two typical Cannon 810 transmitters. Additional stick and retract switch can be added (right) to give five channels. **At top:** Front exteriors of two channel (left) and five channel transmitters. Molded ABS plastic case reduces system cost. **Beneath:** Dual battery charger (with separate L.E.D.'s) supplied with deluxe system. The switch is built into the battery harness so it must be turned on for charging.





The neat receiver layout makes assembly and tuning easy, reducing price of system. An assembly kit is available too, through Charlie's R/C Goodies. **Top:** Mini-Sport airborne components, 10.6 ounces. Smaller servos and battery pack available as option to reduce weight and volume. **At bottom:** G.E. 500 mah A-A pencil nickel-cads supplied are in airborne pack. Light 100 mah and fast charge options.

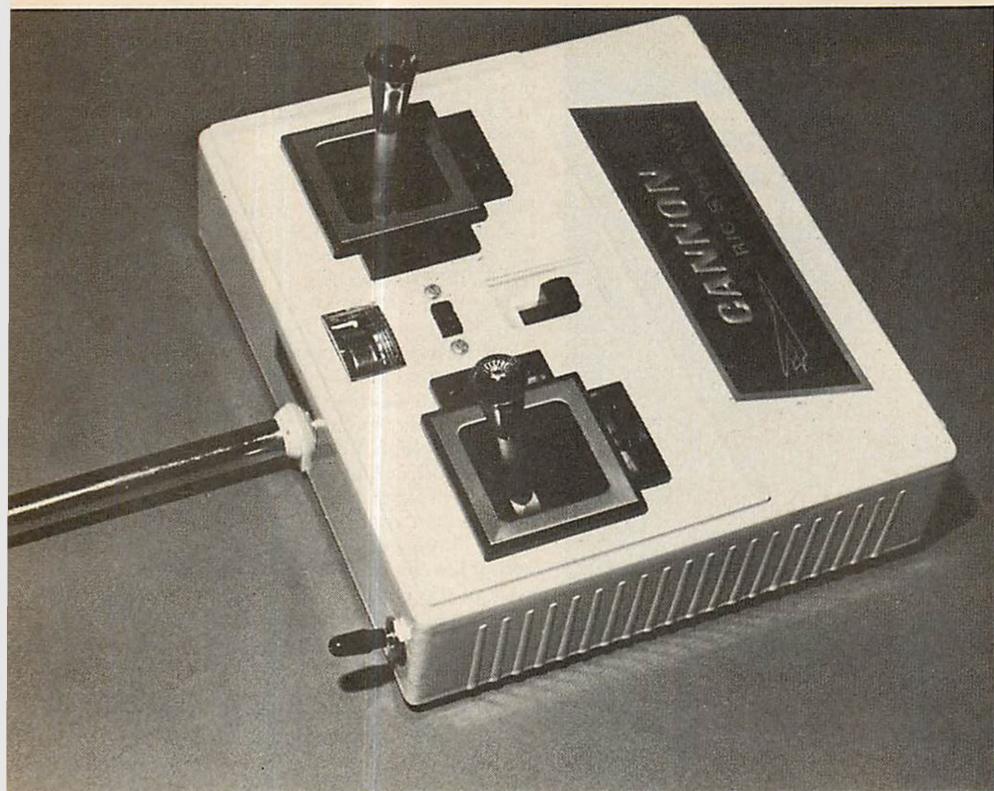


fications indicate a double tuned front end with an F.E.T. R-F amplifier and mixer. Sensitivity is said to be 4 to 6 microvolts nominal, Selectivity is +/- 4 khz at 6 db and the image rejection is -3 db. All of the components are assembled on a single P/C board. The molded case is held together with a single screw located in the center. Maintenance should be a breeze with this layout. Receiver antenna is color coded to the operating frequency (in this case white/red for 72.240 mhz).

The standard servo supplied with the Mini-Sport system is the popular Cannon CE-4 variety. This particular servo is designed around the Dunham D-1 mechanics, which, to a degree, resembles the D&R Bantam units. Each servo measures, 1 1/2" long x 1 1/2" high x 3/4" thick (less mounting flanges and output arm) and weighs 1.25 ounces. An extra long 7 1/2" three wire cable is provided on each servo, terminating in a Deans three pin connector. Cannon servo wiring has the signal lead by the alignment mark of the Deans connector. Power negative (black) is in the center. Power positive (red) is on the opposite end. Inside the servo is the usual 16 mm diameter motor (8 ohms resistance), a 5K ceramic element pot and a single P/C board containing the amplifier. Cannon still uses the popular T.I. 28604 I.C. chip with good success. Specifications continue to use the older power rating of 4 pounds of thrust. Using the newer technology (which is becoming more accepted) this servo should give approximately 20 oz. in. of torque which is sufficient for even a .60 powered model. Servo idle drain is 8 ma. My servos traveled approximately 80 degrees (roughly +/- 40 degrees). Resolution was good with minimum overshoot on return to neutral from full excursion. Additional, assembled servos of this type can be purchased for \$28.95. Individual servo parts are available should you like to do your own maintenance.

The standard airborne battery pack supplied with the Mini-Sport system is a 500 mah variety measuring 1 1/4" square x 2 1/4" long. Cannon employs the G.E. cells of the A-A pen cell size (similar to those used in the transmitter). As with other Cannon radios this pack includes the main power switch as part of the battery wiring harness. This saves the weight of an extra connector. But you must remember to *always turn on* this switch when charging. The battery pack with the switch and cable weighs 4.3 ounces. A red L.E.D. indicates the proper charging (one for the transmitter and one for the receiver). When initiating a charge cycle it's always a good idea to check that the L.E.D.'s are glowing. I measured the charge rate as 42 ma going to the transmitter and 41 ma going to the airborne battery pack. This is roughly the C/10 rate which requires a 14 to 16 hour period to obtain a full charge. Although the transmitter charge connector has a keyed slot I found it possible to connect the receiver output charge connector to the transmitter. This produced only a 10 ma charge current which is far too low. So just a word of caution and use some common sense when charging the transmitter by itself (which admittedly isn't done too often).

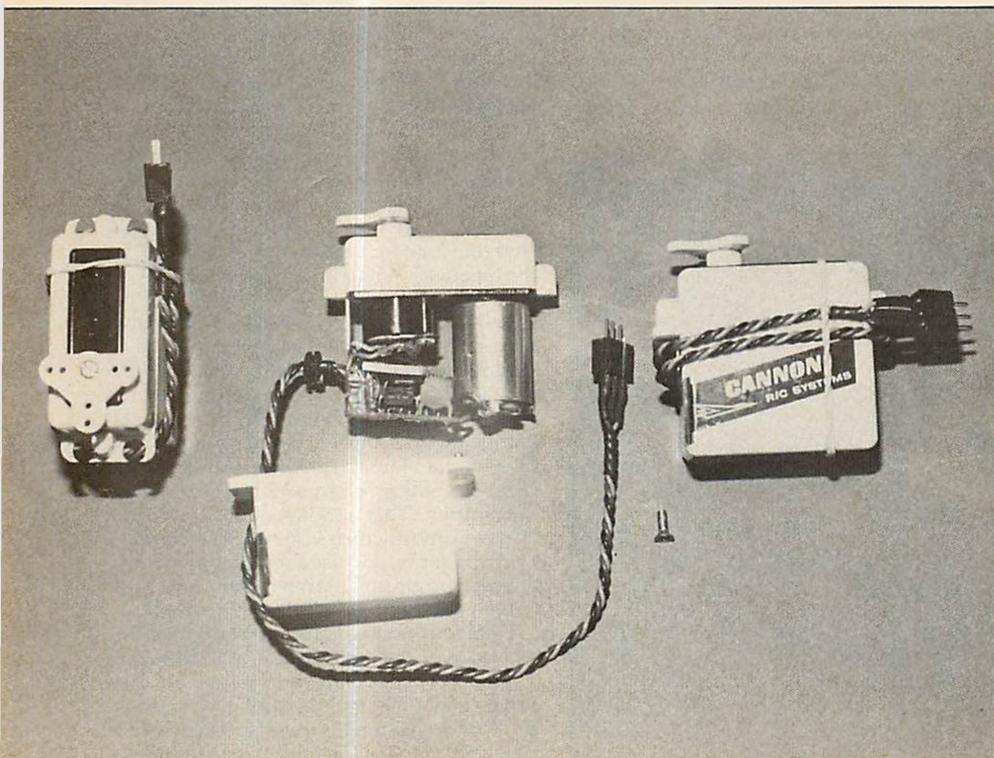
Total four channel airborne weight of this system as just described is only 10.6 ounces. That is very low considering four full size servos and a 500 mah battery pack. I might add that the volume is quite small for a "full size" system. This would make it ideal for



A close-up of the Cannon five channel Mini-Sport transmitter. Dunham semi-open gimbal control sticks, R-F output meter, charging jack beneath. Retract switch, top left corner (not a proportional channel). Below: Cannon CE-4 servos with standard Dunham D-1 mechanics from above, case removed.

the small R/C compartment found in most Q-500 and quarter midget pylon racers. Cannon offers a considerable number of options as to servo type and battery configuration which can further reduce this airborne weight. The subminiature CE-8 servos,

which weigh only 0.7 ounces each, can be obtained with this basic system at a \$7.50/per unit surcharge. Using four of these servos, instead of the CE-4's, would reduce the airborne system weight to only 8.4 ounces. You can also substitute 450 mah and 100 mah



battery packs for the normal system battery. But recognize that your flight time, between charges, will be reduced accordingly. In general I found that four CE-4 servos and the 500 mah battery pack were capable of close to three full hours of operating time on a full charge. This time can, of course, vary with the use of the controls, but it is a good average.

You may have noticed in several of my photographs a two channel Mini-Sport transmitter. As mentioned earlier Cannon Electronics offers a considerable array of options with this particular system. A basic two channel system with dry batteries (both transmitter and receiver) lists for \$119.95. This could be used as a starting point for a beginner. After that the modeler could have his system converted all the way up to the full five channels and could even have rechargeable batteries added. The overall design of this system permits this easy build up. To further enhance this marketing concept Cannon has established a conversion (or upgrading) pricing schedule which follows closely the full system prices. In other words if you bought the basic two or three channel system and later converted it to the full five channel system as described in this review, your total cost would be roughly the same as if you had bought the full system in the first place. The details of all these conversion options are covered completely in the new Cannon Electronics catalog. I suggest you write them for one (address is 13400-26 Saticoy Street, No. Hollywood, California 91605).

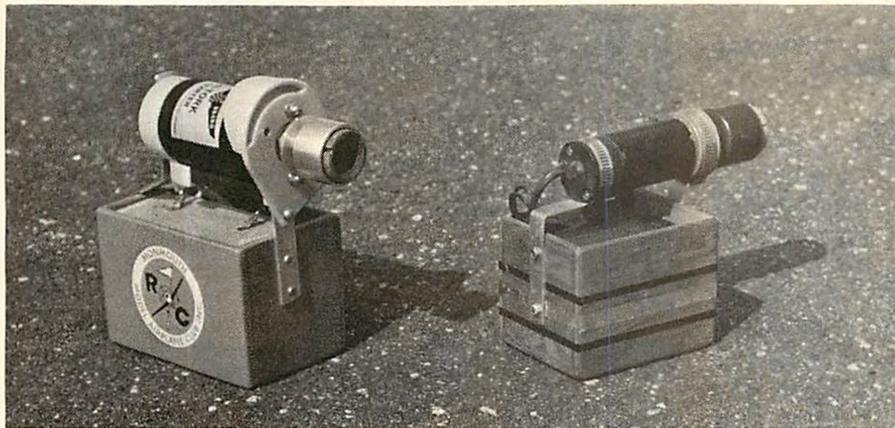
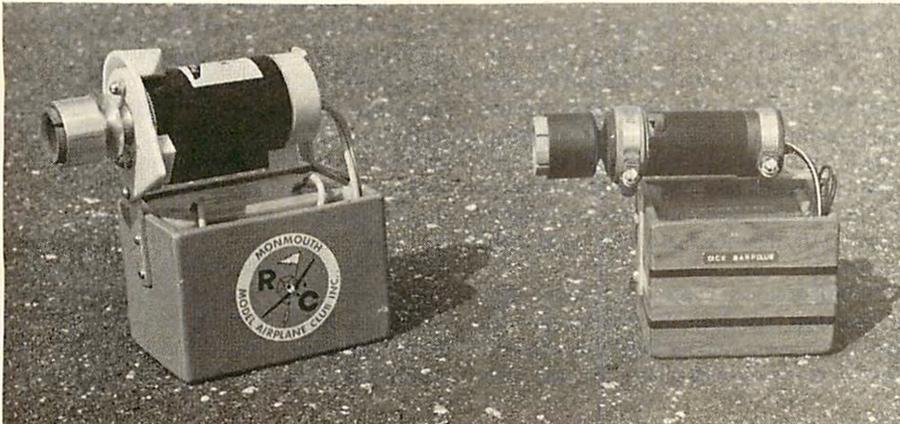
For those interested the Mini-Sport system is warranted for a 180 day period (from the date of purchase). The instruction manual, which I made criticism of in the past, has been greatly expanded. It is complete including licensing requirements and a discussion on the use of frequency flags (flags are not included). If you are technically inclined Cannon will sell you a full set of system schematic diagrams for \$3.50 plus \$1.00 shipping and handling.

I would normally conclude my review at this point. The Mini-Sport performed well, without exception. Having flown two separate Cannon systems for the past three years I can attest to it's overall reliability. But there is still one more feature to be discussed. Earlier this year a separate company directly affiliated with Cannon Electronics started offering a kit version of this same Mini-Sport system. Charlie's R/C Goodies (same mailing address as Cannon Electronics) has a complete series of kits based on this system just described. Although I didn't have the time to tackle the construction of a system I did receive a complete set of assembly instructions for my review. The information provided was excellent. I counted a total of 41 pages including component identification sheets, parts check lists, step by step assembly instructions (with photographs), system tune up, check out and trouble shooting procedures. It is certainly thorough. If R/C kit building is your pleasure you could purchase an equivalent kit of the mini-Sport five channel system for \$199.95. And if I read the brochure properly you can even purchase conversion kits that will enable the modeler to upgrade his Mini-Sport system from two up to five channels without returning the system to the Cannon Electronics factory. All in all this neat little system works well and certainly has a host of options available.

An FM how-to:

Starter and battery box

It's handy and easy to tote around/Dick Sarpolus



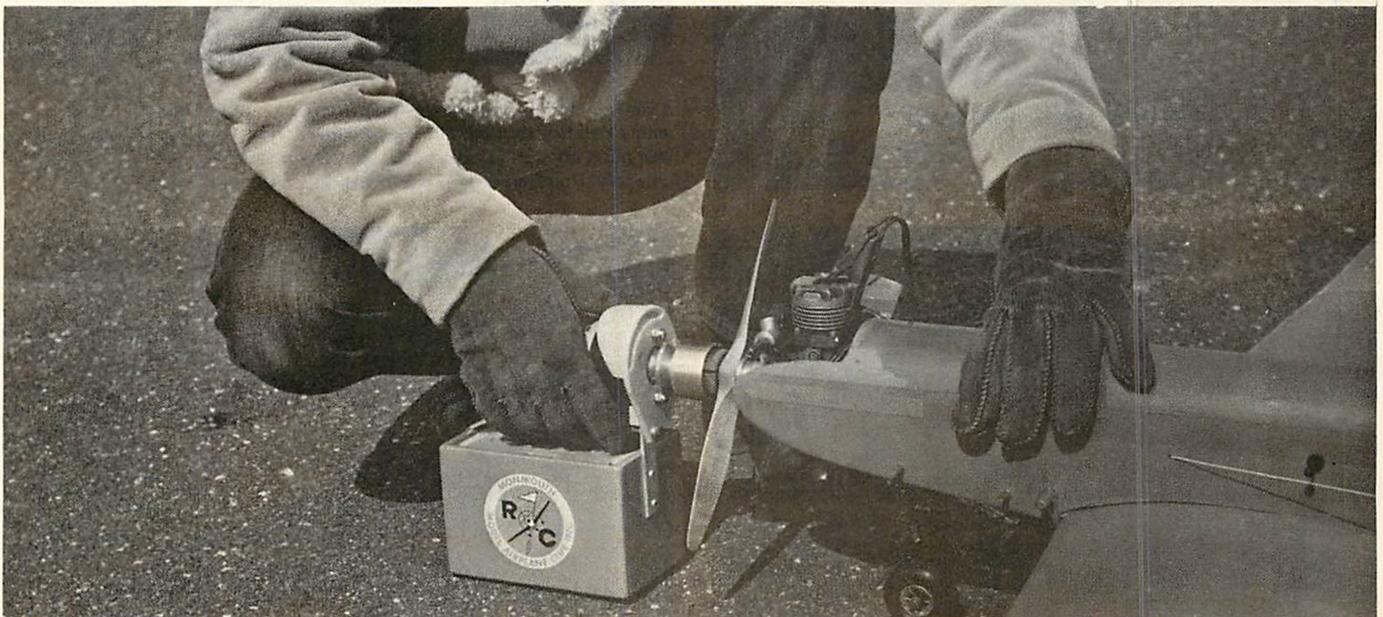
PHOTOGRAPHY: DICK SARPOLUS

Electric starters are of course widely used today, and do a great job. I never cared for the starter being tied to the battery by a power cord which seemed to always get in the way. The availability of rugged, small gel-cell batteries has made it feasible to attach the battery to the starter for a self-contained starter package - no more power cord to worry about. I have seen this done in a variety of ways over the past several years, and the two units pictured show how it can be done.

The box for the battery is made of $\frac{1}{4}$ " plywood, assembled with five minute epoxy and finished with whatever paint is handy. I make the box a little longer than the battery to permit wedging it in place with foam rubber for some shock mounting, and also to coil up the power cord and store it alongside the battery in case it is needed. The starter is mounted above the box with several metal straps, typically $\frac{3}{32}$ " or $\frac{1}{8}$ " aluminum, bolted to the box and held to the starter by any available bolts or by stainless steel automobile hose clamps around each end of the starter.

The smaller unit pictured is a Kavan geared starter with a Delco gel cell made for power lawn mower starting; the larger unit is a Sullivan starter and gel cell. Although the starter/battery combination can make a hefty package, I feel the convenience and portability is worth the package weight.

Now if we make the box a little bigger to hold the glow plug battery, maybe some props and wrenches, add a gallon fuel container, fuel pump, tools, room for a transmitter, wheels. . .



Now Novices are doing what used to be considered only Expert maneuvers. Author **Joe Redan** found

3rd Annual East Coast R/C

For the pessimists who have been forecasting the quick demise of those electromechanical marvels called Helicopters—Take note.

On August 20, 1978, the Monmouth Model Airplane Club Inc. sponsored the 3rd Annual East Coast R/C Helicopter Championships. The contest was bigger, had more contestants, and better weather than last year. Only the machines have gotten smaller. With more entrants flying Heli-Boys and Revolutions, than Jet Rangers and Sharks.

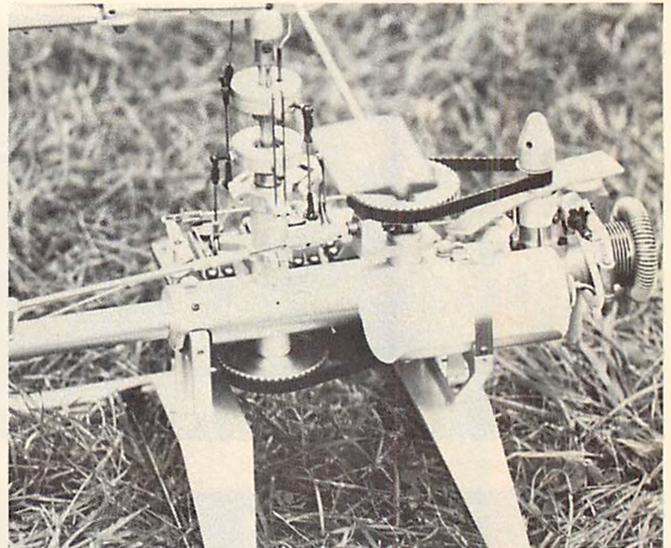
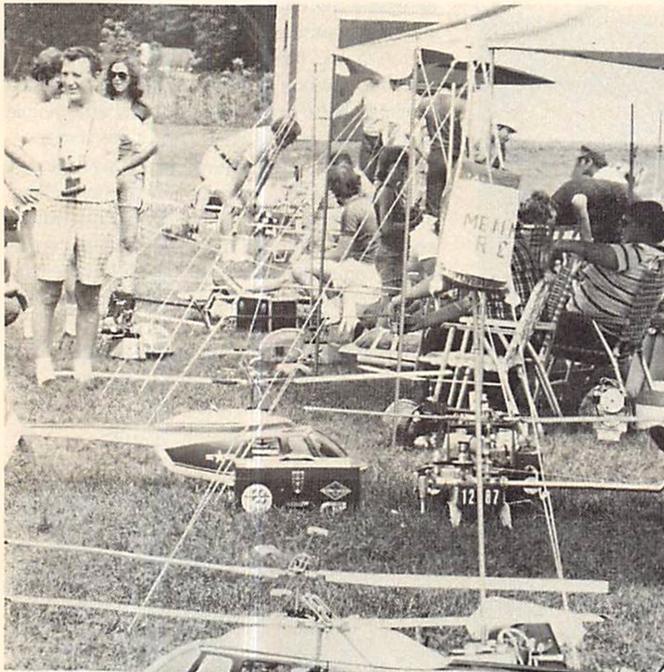
The contest was held at Thompson Park in Lencroft, New Jersey, and was co-sponsored by the Monmouth County Park System. This site is one of the most picturesque for any metropolitan contest. The weather was not the best, but since the contest was run by Horace Hagan we did not expect the weather to be as good as it was (He has terrible luck.). After a 93 mile ride that should have only been 63 miles, we knew we had found

Thompson Park when it started to rain. Of course the contest director could be found under the biggest cloud, and his tent under the biggest tree. As a blessing to all, the storm proved short. It did stay cloudy and overcast the whole day with mild wind that later became calm.

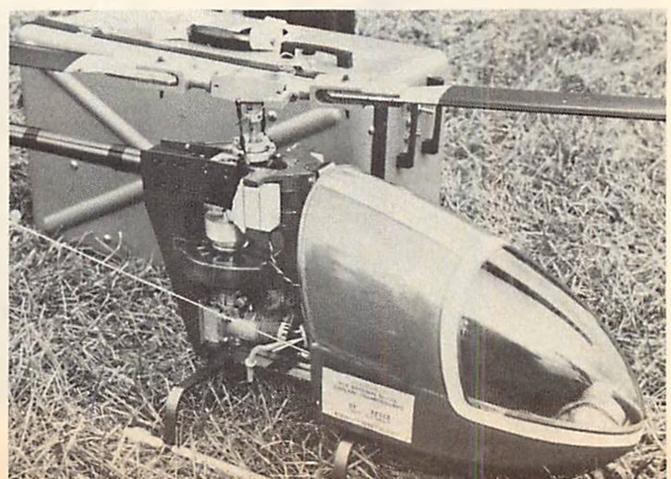
The first round started with a pilots meeting just at 9:00 AM and then into the flying. There were 17 novice entrants, 4 intermediate and 5 expert. Prizes were awarded to five places in each event, except intermediate. Flying by the novice group, some of who only had a minimum of stick time, made the experts take note. They were good! Two rounds were held and a vote was taken at about 3:00 by the pilots that a third round would be omitted.

The biggest crowd pleaser was the show put on by the expert class flyers. Ron Barker took first place in this event with his Rigid-Rotor Revelutions. He flew a beautiful pattern that was made

up of the required novice, intermediate, and then the expert free-style flight of a loop, roll, and chandelle. The loops and rolls by the experts made the 360 degree hover maneuvers of the tail in and out seem easy enough that even I could do it. To prove that all was really not that easy, Tom Kner executed a loop pulling out just in time to clip his tail rotor, and still landed with no further damage. At this point we have to go back to the first expert flight of the day which was flown by Ralph Dolusio. Ralph was flying a truly expert pattern. A loop, a roll, and then into a 360 degree stall turn, and stall it did. From about 30 feet up, into the ground at about a 45 degree angle. Bent tail boom, stripped gears, flybar, and blades broken and cabin in pieces. To most this would have been a three week job. We thought, at first, it would take Ralph that long to recover from the shock. Ralph went on to rebuild the ship and take second place in expert. Here's the way he did it:



A view of the pits (left) shows the participation level. Doing the maneuvers with a Heli-Boy (bottom left). Fay Peoples original design chopper (above) was good enough to take home some hardware, third place in the expert category. Ron Barker took 1st in Expert with this rigid rotor ship.



that choppers are alive and well at the . . .

Helicopter Championships

Ralph had a back-up ship with him, but it was not set up, and he didn't trust it. Since the number one ship was his best, he stripped off the damaged parts. The main frame, engine, and radio to the amazement of all, was not damaged. Hot Stuff, borrowed from Horace Hagen (now he knows where it went), repaired the cabin. Tail boom, rotors, flybar, and drive gear from ship two completed the repair. A quick run up showed a set of badly out of balance rotors. A quick solution by Don Minor of Variant R/C systems. Don wrapped plastic electrical tape around one rotor blade and with a fifty/fifty chance of picking the out of balance blade, he picked the wrong blade, the tape was moved to the opposite blade correcting the balance condition.

Ralph's ship is a modified Heli-Boy, powered by a Webra 61. The main side plates which withstood the crash so well, were made by Don Minor. They are .125 thick 2024 aluminum alloy

in place of the standard .093 thick side plates. The other mode was to eliminate any right angles in the side plates which the standard Heli-Boy has just forward of the main rotor shaft. Right angle bends or cuts are places where vibration and load can cause cracks to begin. This abrupt change in a section is called a stress raiser, and the more they are eliminated the stronger the design.

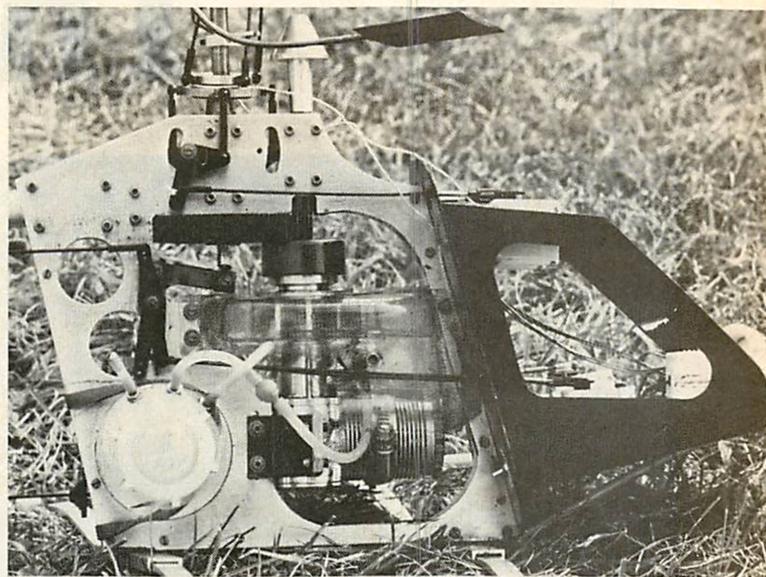
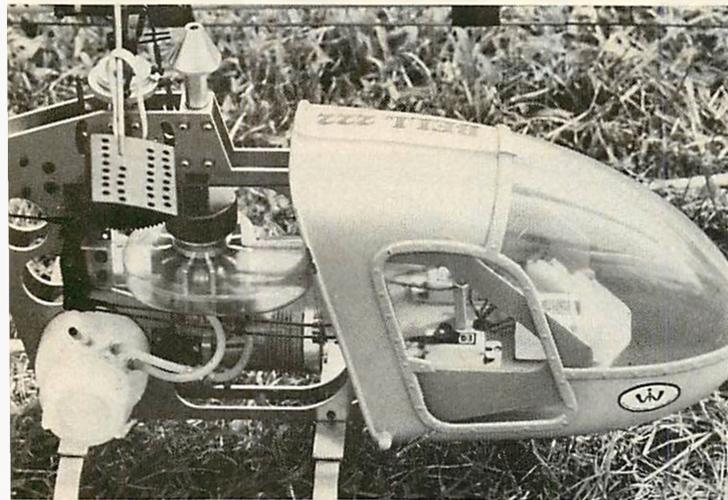
The new Heli-Boy modified, or as kitted is this season's machine to be reckoned with. Last season's East Coast R/C Helicopter Championships saw loops being performed in the expert category with machines as heavy as the Du-Bro Shark. This year the Heli-Boy is being flown into loops, rolls, stall turns, and of course the real-test, a consistent hover. The machine can now do just about all that we ask of it. The novice flyers in this year's contest haven't heard that an R/C helicopter can't be flown. Some who responded to the FLYING MODELS survey had been flying for

only a couple of months and were getting out to fly one day a week for an average of one hour.

The East Coast R/C Helicopter Championships has been growing bigger each year. This year the contestants came from six states, covering a radius of almost 400 miles. In a year where contest attendance has been heard to be dropping, this contest has grown. The Monmouth Model Airplane Club, Inc., and co-sponsor; Monmouth County Park System, ran a contest that was "well done" from start to finish. Parking, rest rooms, pit area, and the flying site were all neat and clean. The program was well planned and judging was consistent throughout.

Flying Models, with the help of the Monmouth Model Airplane Club, Inc., and the cooperation of those flying in the championships conducted a survey to let you, our readers, know what the contestants were flying, and with what equipment.

ES



Ralph Dalusio's main and back-up ships (above and left) which are described in the text. Note the mod from sharp to rounded corners in frame.

PHOTOGRAPHY: JOE REDAN

Results and Equipment used in the 3rd Annual East Coast R/C Helicopter Championships

Novice

Pilot	Helicopter	Fuel	Engine	Radio
1. L. Smith, Pa.	Heli-Boy, coll., fn	K&B 500	—	Pro-Line SS
2. W. Martin, Pa.	J. Ranger, Coll., fn	Power Blast	Webra Speed	Kraft 2S
3. J. Kinsey, Pa.	Revolution, fn.	Home brew	K&B 40	Pro-Line SS
4. S. Habershaw, R.I.	J. Ranger, coll., fn	K&B 500	Webra Speed	Kraft 2S
5. T. Unger, N.J.	Shark, gyro, fn	Red Max	OS .60 FSR	Kraft SS

Intermediate

1. W. Rodriguez, N.Y.	Heli-Baby, fn	Red Max	OS .45	Kraft 2S
2. E. Thielmann				
3. L. Stone				
4. R. Palmer				

Expert

1. R. Barker, Mass.	R.R. Revolution, fn	K&B 500	HP .61	Futaba 2S
2. R. Dalusio, Conn.	Heli-Boy, coll., ft	JMP 5%	Webra Speed	Variant 2S
3. L. Davidson, N.Y.	Heli-Boy, Coll., fn	Magnum 15	HP .61	Kraft 2S
4. F. Peoples	Original			
5. T. Knerr				

Note: fn = flying nose ss = single stick
ft = flying tail 2s = two stick
coll. = collective

Better mileage! More Brake Horsepower! Fewer Things to go Wrong! Wave of the Future! These are a few of the claims being made for diesel-powered automobiles in all segments of the advertising media these days, and they're not just claims, they're true. What has all this got to do with aeromodelers? Just this—there is also a rising tide of interest in the diesel model aero engine. And for the same reasons that diesel automobiles are catching on.

Diesel engines, both the large, and the model variety, have been around for years. While quite popular in Europe, they never got too much support in the United States. Not until, that is, fuel prices began rising and talk of shortages became prevalent. But let's concentrate on our first love, the model variety. Actually, these little wonders are not true diesels in the strictest sense. They are best described as compression ignition engines. And that is exactly what happens in the model diesel, the heat generated by compression causes ignition and combustion of the fuel-air mixture. And, let's face it, troops, combustion is the only thing you're after, 'cause when that happens, your power plant is running.

Let's explore the operation of the model diesel and how it differs from the glow plug engine. Of course, the first thing you notice, when you look at a model diesel, is that there is no glow plug. Instead, you notice a screw running directly into the head. This controls the compression and, in actual practice, works much like the spark advance on an ignition engine. There is a second piston, called a contra-piston, in the cylinder of

the diesel. By moving this contra-piston up or down with the compression screw, you can decrease or increase the operating compression. It is, therefore, a variable compression head. The needle valve works much the same as on any engine, but is, generally, not as sensitive as in the glow types. Diesels are produced in both the front shaft and rear disc types of induction. The Davis conversions, produced in this country by Davis Diesel Development work fine with the Cox reed valve system. But we will discuss the David conversion heads a little later.

The standard diesel is necessarily machined to fine tolerances and requires a modest break-in period. On the other hand, close tolerances mean a well-machined product that should have a longer working lifetime.

The other big difference is the fuel itself. Diesel fuel contains three major ingredients, kerosene, castor oil (or synthetic equivalent), and commercial ether. Some prepared brands use a small amount of additive to assist starting, generally, amyl nitrate, however a basic fuel of equal parts of kerosene, castor oil and ether will run most any model diesel. Here's an interesting aside, as re-

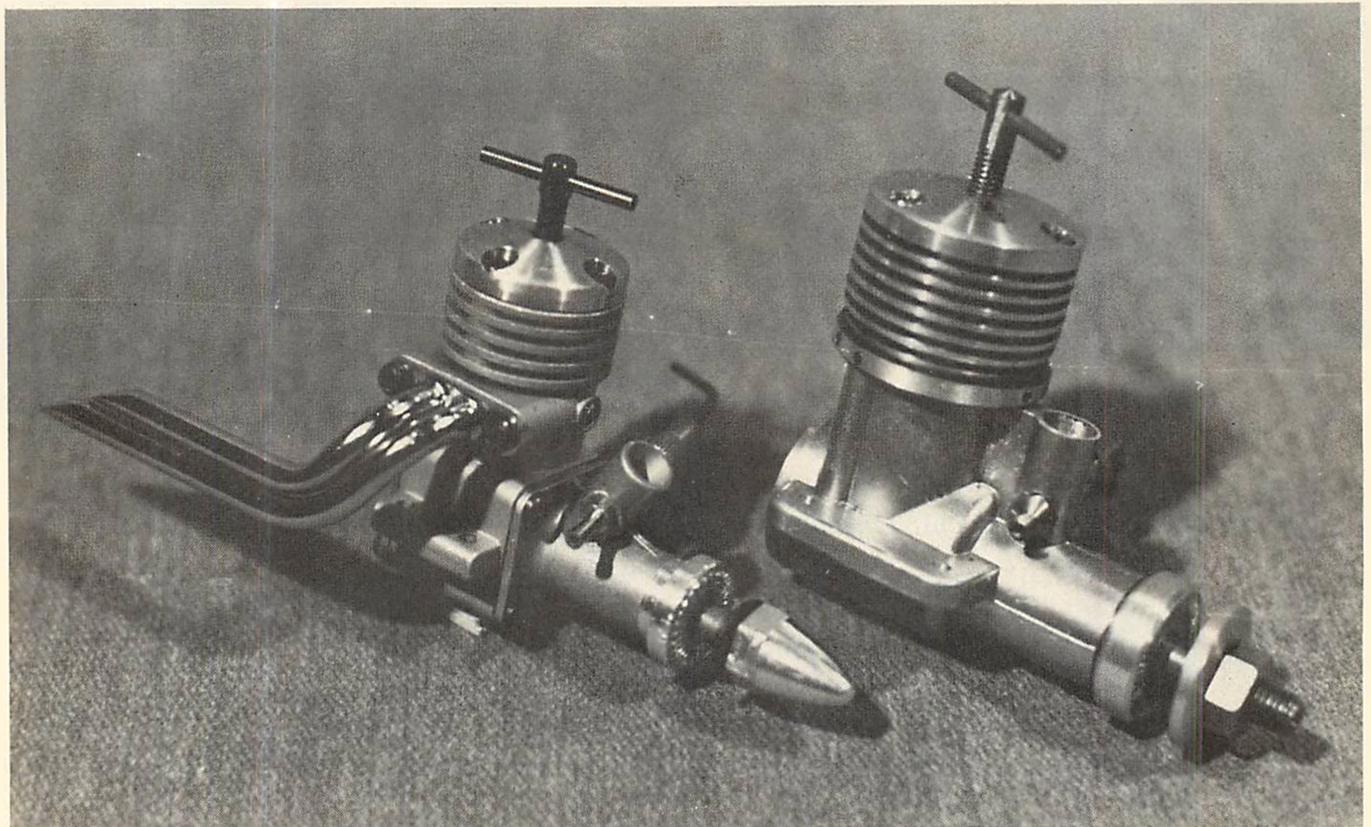
gards fuel (which, by the way, I don't recommend that everyone try). Bob Davis tells me that, in testing his conversion heads, he tried a "way out" experiment. He started his test engine on regular diesel fuel. When he had almost run the tank out, he refilled it with *Wesson Oil!* Yes, that's right, the regular cooking oil. And would you believe the engine kept running? Oh, Bob says it threw out some sparks and slowed down just a bit, but it actually ran on the stuff. How does that grab you? Want to try it on your favorite glow engine?

Okay, let's look into running these little gems. For years, I've heard all the old wives tales about diesels being hard to start, sensitive to temperature and humidity, cranky and hard to adjust, and so on, ad infinitum. Bunk! Pure hokum! I've been a diesel user for more years than I like to admit to and I can assure you that the model diesel is no more trouble than any other engine and in some cases, a lot easier to operate.

Starting procedure, once you've adjusted to the fact that you don't need a battery, goes like this. Open the needle valve two or three turns, fill the tank and suck fuel into the line in the usual way. It's usually best to prime by choking rather

The Diesel

PHOTOGRAPHY: JACK ARNOUTS



Two currently available diesel engines (above). At left is the new British Kingcat Deluxe that beautifully curved, chromed silencing pipes. A very powerful, high revving .09. At right is the P.A.W. .19, one of the largest diesels available, shown here equipped with its ring-type silencer. A very powerful engine capable of competing with glow .29's and .35's. At right (opposite page) are two throttle equipped diesels for R/C use. On the left, the currently available M.E. Heron .09, shown here equipped with its attractive twin silencers and on the right, the no-longer available Taplin Twin, .50, one of the smoothest running ever built.

than injecting fuel directly into the cylinder. Because of closely machined tolerances, it's quite possible in the case of an over-prime, to get a hydraulic lock. Okay, now you're ready to start. Before flipping the prop or applying your electric starter pull the prop through slowly to check for hydraulic lock. If a lock should occur, don't force the prop over. Back off the compression and pump out the excess by turning over the prop or blow it out. Then return the compression screw to its original position. If you should have a lock and were to give the usual starting flip, it could result in a bent rod, a broken prop, a broken finger or any combination thereof! Now you're ready to go, so prop it, or apply your starter. If the engine doesn't "pop", increase the compression about 1/8th turn of the compression screw. Never increase compression more than 1/4 turn at any one time. Keep following this procedure until your engine is running.

Once running, you're ready to set the compression. If it runs with an irregular, "burping" sound, increase the compression just until it smooths out. If it starts running smoothly, decrease compression until it gets irregular and then

increase just until it is running smoothly. This will give you the best compression setting. Over compressing will not increase engine r.p.m. The engine will merely labor, lose speed, and its lifetime will be shortened appreciably. Once you've obtained this compression setting, you can pretty much forget about it. Most diesels will start and run on the same setting. As parts wear in, on a new engine, you may have to increase compression slightly.

The proper needle valve setting is obtained much the same as in any glow engine, but it is advisable to break in the diesel on rich settings for a longer period of time - again, due to the closely machined tolerances. You will also note that your diesel is much more amenable to hot re-starts than most glow engines.

I guess a word about propellers is in order. Recommended sizes are included in the operating instructions that come with any new diesel. You will notice that, size for size, the diesel uses a larger prop than a comparably sized glow engine. It's a simple fact that diesels are happier when well loaded but, after all, who isn't? The instruction sheet for an old .75 cc (.049) English Mills

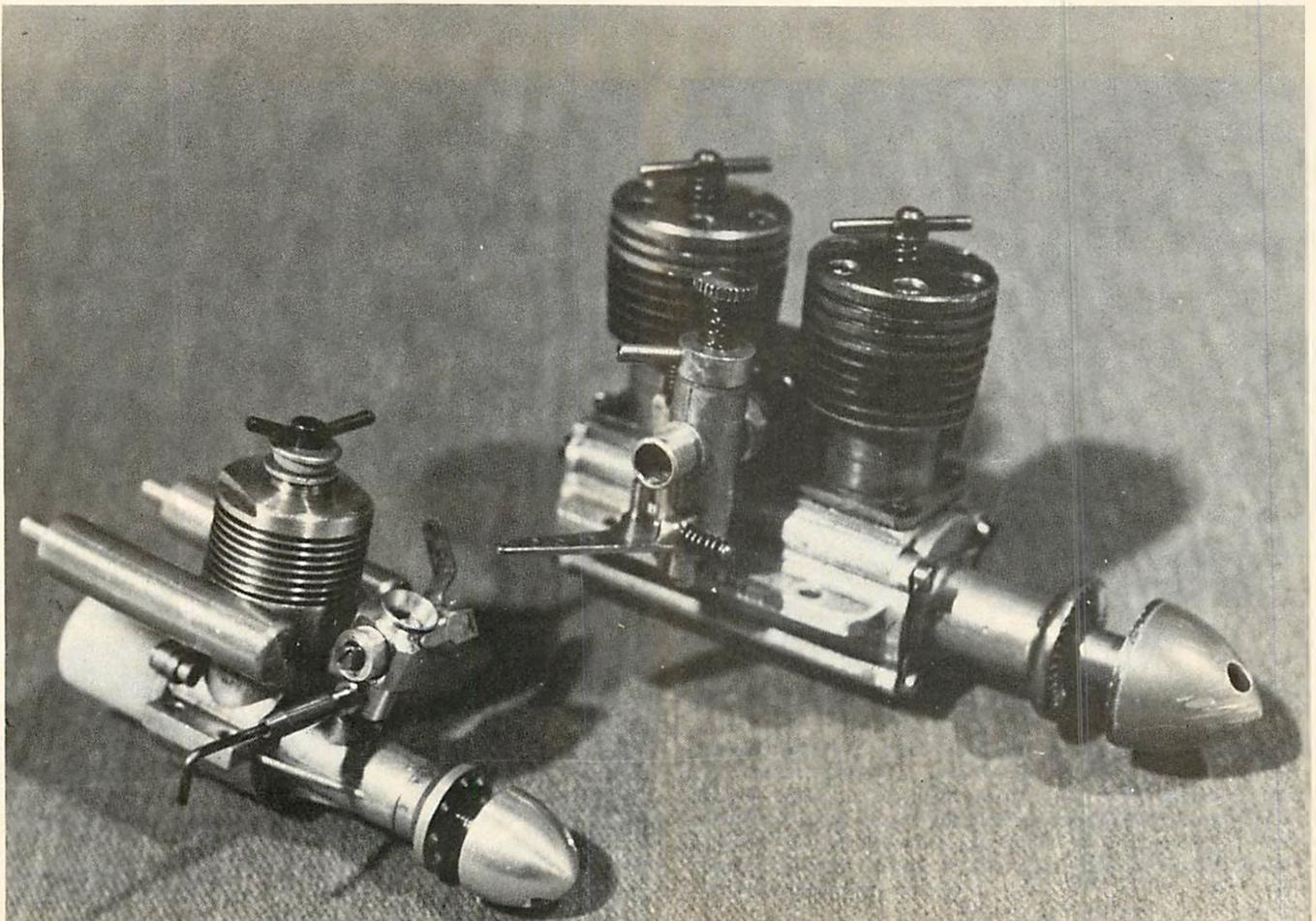
which I own calls for an 8-4 prop and I always run my .5 cc (about an .03) D.C. Dart on a 7-inch diameter prop.

Now, in case you're not convinced to, at least consider a diesel, let's take a complete look at some of the advantages. To start with, the close tolerances and fine machine work mean a longer lifetime for the engine. This is also helped by the fact that diesels generally run much cooler than glow types. And, surprisingly, diesels are not expensive. In most cases, they cost about the same as, or less than, a comparable glow type. Of course, there is absolutely no cost for such things as starting batteries and replacement glow plugs. Did you ever get to the flying field and find that your starting battery is dead or forget extra plugs? This can ruin your day quicker than a mother-in-law's visit. But it can't happen with a diesel. Then we come to fuel consumption. The diesel is absolutely miserly here. Most diesels will run about 50% longer than a comparably sized glow engine on the same amount of fuel. Okay, will you concede to better economy of operation? Good.

How about actual power output and general

This method of turning a crankshaft has been around a long time and still has a lot going for it. Here's how it works /
Earl Van Gorder

Revolution



usage. In the brake horsepower department, the diesels are way ahead. The brute power available is surprising. A .15 diesel puts out about the same power as a .29 glow. Don't look for the super-high r.p.m.s, though. That's not a diesel characteristic. It is interesting to note, however, that in Europe a number of team racers use diesels in spite of generally lower r.p.m. About a year, or so, ago, a Super Tigre .15 diesel beat a Rossi .15 glow in a team race in spite of the fact that the Rossi could "eat it up" in individual lap times. How then could the diesel win? Super fast hot re-starts was the answer. Like they say at Indianapolis, most races are won in the pits.

Here again, we must mention that the Davis conversions are an exception. In his tests, Bob Davis has obtained astounding r.p.m. figures and I have personally run a Cox .020 PeeWee with a Davis head at 22,000 r.p.m.

Generally speaking, in this country, the free flight scale people are the real aficionados of the diesel. Larger, more scale-like props, more scale-like speeds, and even a more scale-like sound are some of the reasons. Couple this with the fact that the diesel can be hidden under scale dummy engines, or cowls, without having to worry about how to get battery leads to it for starting. As for inverted mounting, without a plug to flood out, the diesel doesn't know, or care, in what position it's operating.

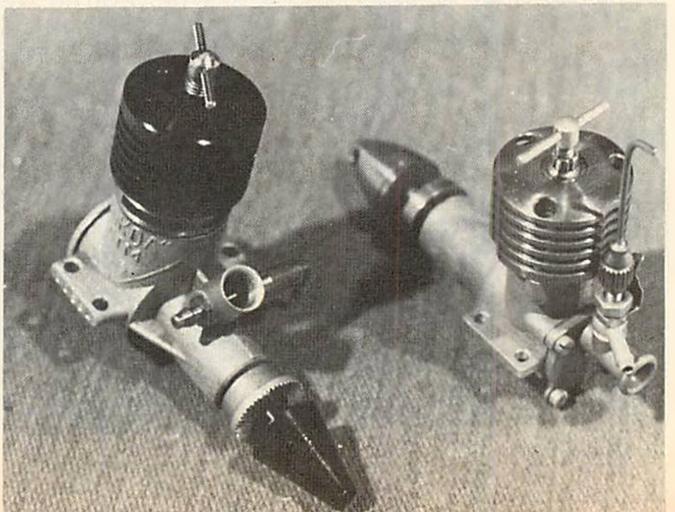
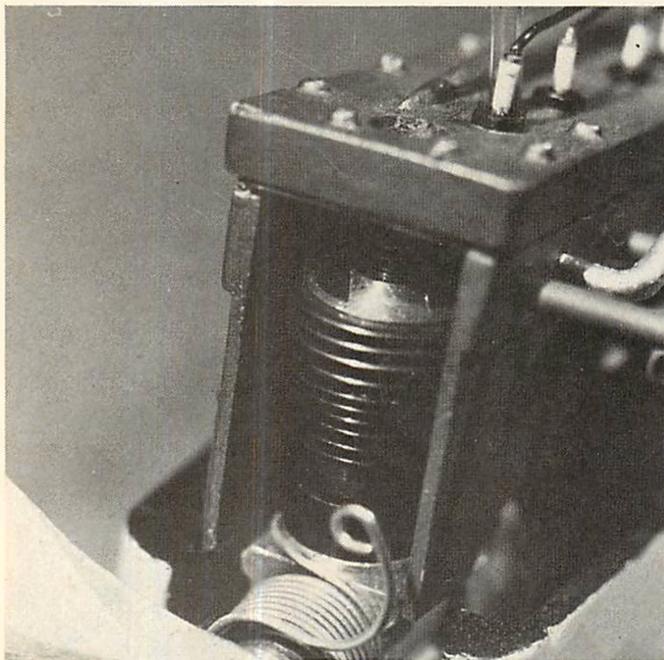
As for R/C, a number of diesels are now available in R/C versions as are the Davis heads. Now I suppose you've also heard that diesels quit when throttled down because the engine cools off and quits firing. I don't claim to know any technical details and I'm certainly not an engineer, but I do know this - I've run large R/C diesels (my Taplin Twin, a .50) and small R/C diesels (my M.E. Heron, an .09) and have been able to achieve a virtual "tick-over" idle with both as well as having both take full throttle again without cutting out.

So, how do we sum up the advantages? Well, simply, the diesel is a fairly inexpensive engine, with a long life expectancy, that uses less fuel, needs no plugs or starting battery but still puts out more brute power and throttles well. And that, in a nutshell, is why more and more modelers are making the switch and joining the diesel revolution.

How about availability? Well, at this writing, to the best of my knowledge no American manufacturers are producing a complete diesel engine. In the past, we had some manufactured here, but for some reason, most American manufacturers never went "all out" as they did with other types. The Duramatic Co., producers of the McCoy's, put out an .049 diesel for a period of time. Herkimer Tool and Die, producers of the O.K. series of engines also made an .049 and a .074 diesel.

Even the famous Arden engines had a dieselized version at one time. Probably in the American diesel sold in the largest quantities was the Drone, a .30 size produced by Leon Shulman. This attractive black engine with gold head was a fixed compression type but the company later made available a conversion head which featured variable compression. And there were others - the Mite, the Micro, etc. - but all eventually went the way of the dinosaurs. For a period of time, it was necessary to have a friend overseas in order to get a diesel. But this is no longer true. Diesels are available in this country again, albeit they are not manufactured here. Hobby Hideaway in Delavan, Illinois handles most all the British Diesels, the P.A.W. series (that's Progress Aero Works - not Pratt and Whitney!), the D.C. (Davis Charlton) line, the M.E.s (Moore Engineering), the E.D.s (Electronic Developments), the Kingcat produced by Kingshire products, and the re-makes of the famous Mills .75 cc and 1.3 cc which are manufactured in India and sometimes called Koomah. They even handle the Llam and Zom diesels from Spain. Dave Shipton, proprietor of Hobby Hideaway is a "diesel nut" himself and he puts out some excellent printed material for the newcomer to diesels. Eastern Diesel Supply in New Jersey also handles all the English diesels and will even "special order" an Oliver Tiger for you. The Webra diesels as well as the Super Tigre

Diesel Revolution



A Cox Golden Bee (above) with a conversion head by Davis Diesel Development hiding in the dummy SOS engine of a House of Balsa 1/2A Pete. Out of the past (top right) two American diesel efforts. On the left, a dieselized version of the Arden .099 and on the right, the OK Cub .049 diesel. Russian diesels in current production (at right). Not available in the U.S.A. as of this writing but they are available through English dealers. On the left is the fine running Sokol Eagle, a .15 size and on the right the ball-bearing Meteor MK 16, a well-built and fine running .09 diesel.

diesels are available from any U.S. dealers who handle those lines. Many of these engines are available in R/C versions, and silencers (that's British for mufflers) are available for almost all, from the beautifully curved twin pipes of the Kingcat to the simple ring type used on the P.A.W. Now, I promised earlier that we'd discuss the conversions by Davis Diesel Development of Milford, Conn. Bob Davis is another modeler who believes in the future of the diesel. As a matter of fact, Bob is so convinced that he's betting a good chunk of his time and his capital on his belief. He produces conversion heads for the Cox .020, .049, and .09. Now these conversions feature a slightly different twist. The Davis heads are of the variable compression type with a contra-piston. But here the similarity ends. The difference is that the contra-piston in the Davis heads is a rather loose fit and the compression seal depends on a fluoro-carbon (Teflon) insert. The system works beautifully and provides several advantages. In fact, as I recall, Peter Chinn once called the Davis idea the most notable single development in the model diesel principle since the inception of the type. The heads work equally well on either the front rotary or reed valve Cox types. Davis produces an additional line of items that include an excellent diesel fuel, teflon replacement reeds, heavy duty crankshafts and a throttling gadget among other things. The Davis

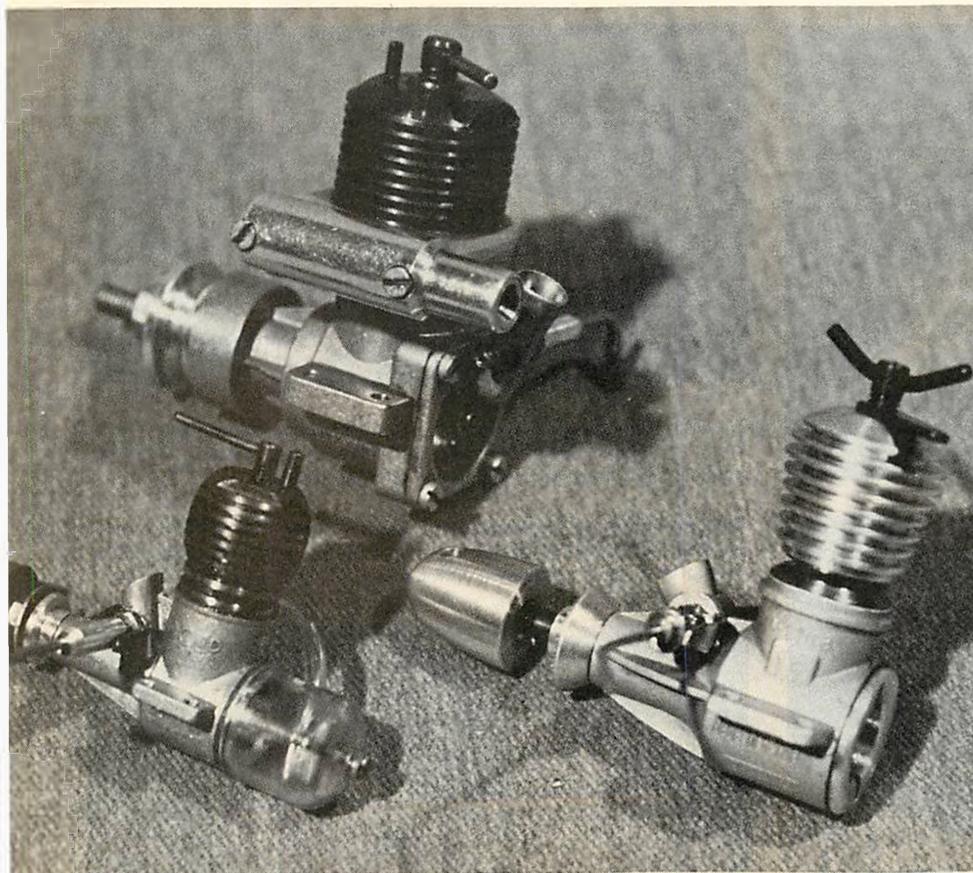
throttling system attaches to the compression screw and achieves r.p.m. changes through changes in compression. While this method doesn't work too well on the foreign diesels, it appears to work very well on the Davis conversions. Of course, the standard exhaust throttle or the Tamo carb will also work very well with the standard Davis head.

Bob assures me that conversions for additional engines will be forthcoming and he is currently working with a dieselized O.S. 40 which he says runs beautifully. Bob is constantly experimenting and some of the results he is getting in r.p.m. and horsepower are nothing short of astounding. He gave me one of his test engines, a converted Golden Bee equipped with the Davis head, teflon reed, and heavy duty crankshaft, and I can assure that it is an absolute "bear"

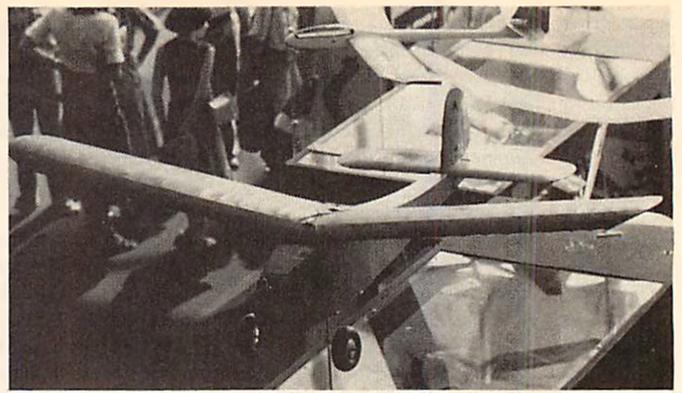
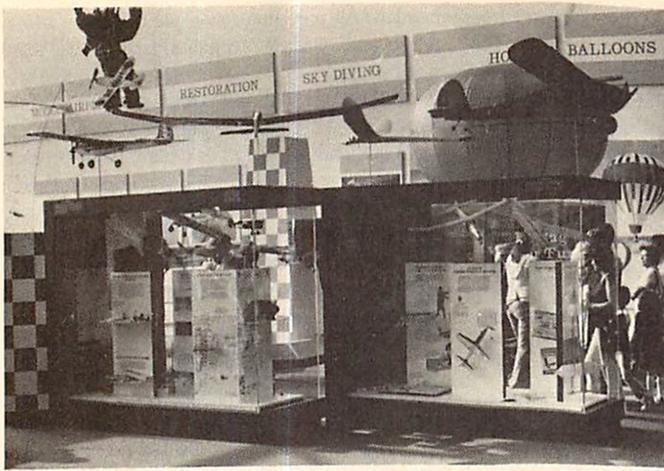
There are a few minor differences in getting used to the operation of the Davis conversions. Unlike the regular diesel, with which one must be constantly alert to over priming and hydraulic locks, the Davis is much less sensitive to a heavy prime. As a matter of fact, a Davis conversion seems to like a heavy prime. Many new users have made a mistake when the engine would pop, but not continue running. They added a little more compression. This is not the proper technique with the Davis. If the engine pops, it is *ready to run* and no more compression is

needed. All that little feller wants is a bit more prime and, given that little extra drink, will start singing. Most other operating techniques are much the same with the Davis as with any other diesel. But, here's some real news! You'll recall that I said earlier that *at this writing* no American manufacturer was producing a complete diesel. Well, maybe even by the time you read this, a complete Davis diesel engine may be ready for the market. Bob Davis is a dreamer who makes his dreams come true and right now he's got that gleam in his eye again.

One of those strange coincidences which sometimes happen occurred while I was sitting at my typewriter in the midst of putting this discourse on paper. A good friend dropped in at the house with a new P.A.W. .19 which he had purchased on my recommendation that it would be just the thing for a new scale Ukie project he's working on. He asked if I'd check him out on starting and operating procedures. He was amazed when I hung a 10-6 club on that .19, but even more amazed when he saw how easily it kicked over and began running. He was absolutely overjoyed when he heard the deep scale-like note of the exhaust while running at a smooth 7500 r.p.m. break-in speed. By the time we had put an hour and a half of break-in time on that engine he was sold! How about you? Gonna join the diesel revolution, too? ☞



The famous English Mills 1.3cc (.09c.i.) (above) mounted in a reconstructed old timer free flight. Three currently available diesels (left). Top, the ball-bearing D.C. Rapier that comes complete with silencing manifold. Lower left, the D.C. Dart, a .5cc (about .03 c.i.) diesel that is a big favorite with F/F scale builders and lower right, the Webra Record, an .09.



The model airplane display includes the Good brothers' Guff and other large planes above two display cases which contain smaller models. Walt and Bill Good were flying this R/C Guff in the late 1930's (left).

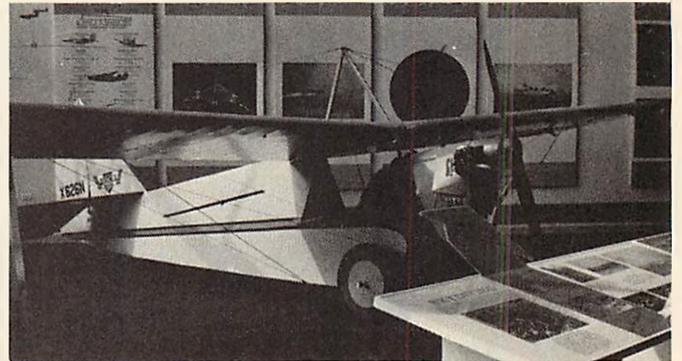
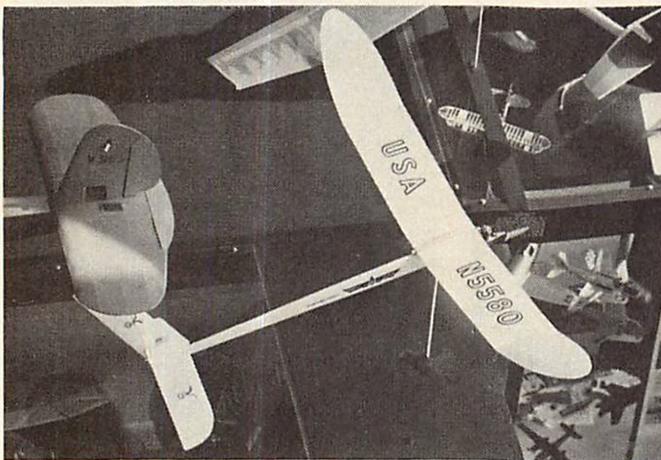
Model Airplanes at the National Air and Space Museum

Now all of aviation is truly represented/**Richard Weber**

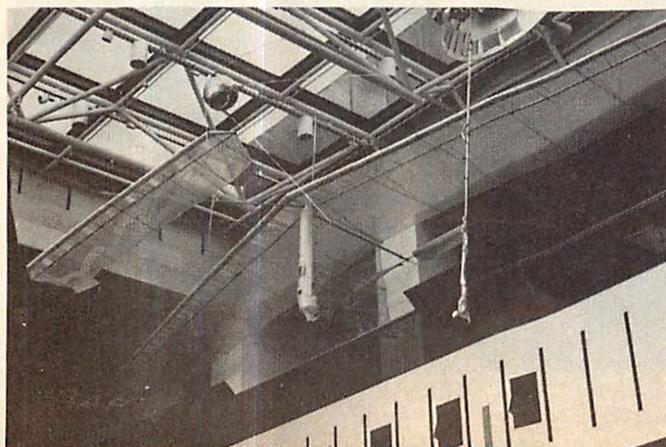
The National Air and Space Museum in Washington, D.C. became an instant hit with airplane buffs when it opened in July 1976. However, for many of us something was missing—it had no collection of flying models. Happily, this omission has been corrected. In July 1978 a new display area was opened. This area presents the sports of model airplanes, antique aircraft restoration, sky diving, hot air balloons, hang gliding, kites, frisbees, boomerangs and soaring.

Representative model airplanes are shown in two display cases. Above the cases are four larger planes. The Guff, built by Walt and Bill Good, is the center of attraction. This was one of the earliest RC models. It was first flown in 1937, and won the Detroit Nationals in 1939. Guff weighs 8½ pounds and is powered by a 1/5 h.p. Brown Jr. engine.

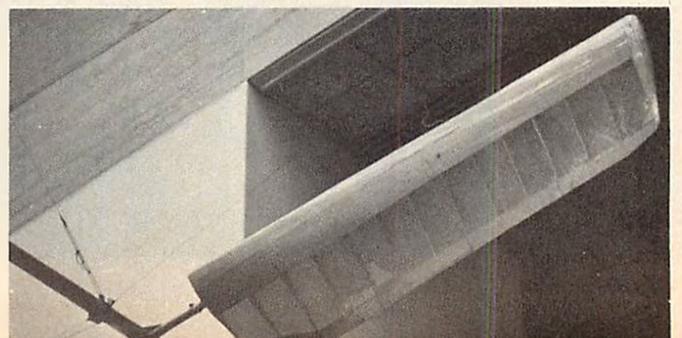
PHOTOGRAPHY: DICK WEBER

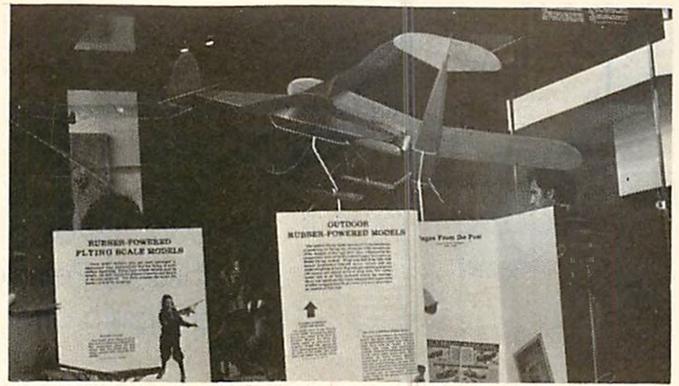
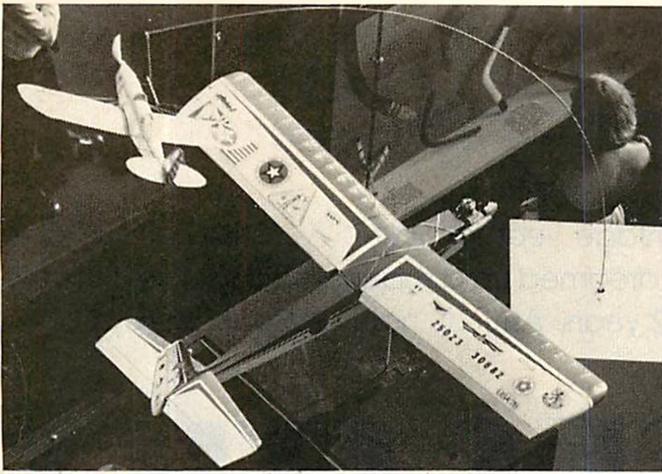


The Free Flight design (left) flown by Tom McLaughlan at the 1977 FAI FF World Championships in Denmark. 1929 Aeronca C-2 (above) weighs 406 pounds, has two-cylinder engine and straight axle gear.



Clear Mylar covered Cossamer Condor won Kremer prize in 1977 for man powered flight. Canard design is reminiscent of Wright brothers planes. Prop of the Condor (below) is a twisted model plane wing built of balsa.





This modified Senior Falcon, a Goldberg kit, was dubbed the Liberty Bell and was used by Bob and Doris Rich for their trip from the Atlantic to the Pacific. Rubber-powered Free Flights are shown in the display cases.

Behind Guff is a modern Rossi .15 powered free flight model, built by Tom McLaughlan. He flew this plane at the 1977 FAI FF World Championships in Roskilde, Denmark. In addition to all the usual FAI FF automatic functions, this model has a one-piece prop which rotates out after the engine run, pointing forward to reduce drag.

Model R/C sailplanes are represented by the Aquila flown to victory by Skip Miller in the 1977 FAI World Championships in South Africa. It is remarkable that this standard class design slew all the giants flying in the championships. Both the model and the pilot are superior performers.

A transcontinental adventure, as well as a sport R/C craft, are present in the form of Bob and Doris Rich's Liberty Bell. This is a Goldberg Senior Falcon modified with flaps and an oversized tank for cross country flying. Behind the Liberty Bell some boomerangs are visible.

Inside the model airplane display case are a variety of planes. Control line scale, speed and sport are there. Modern and antique free flights are present, including gliders, rubber powered, and engine powered craft. Solid models and plastic models are represented. Dick Kowalski's 50-minute FAI indoor record setter is there.

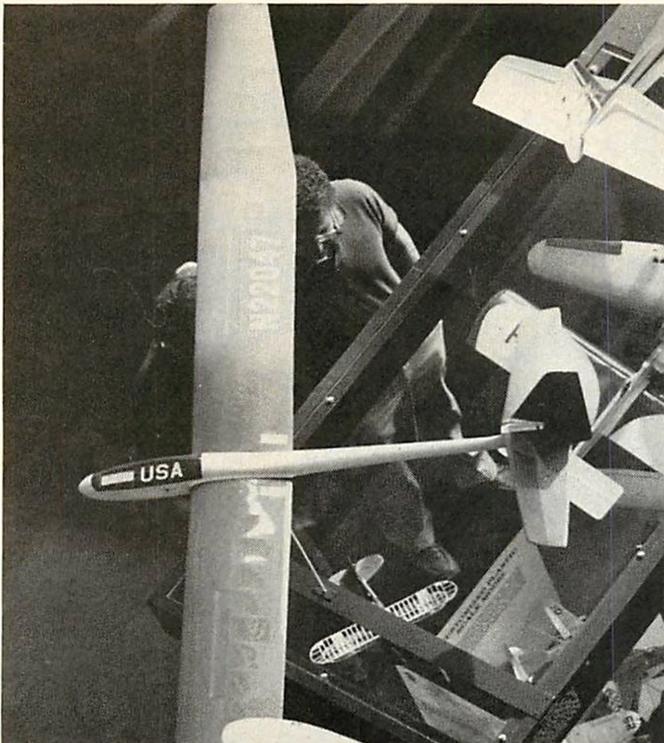
Seven examples of model airplane engines are exhibited together. They are a 1934 Brown Jr. ignition, a BWM 2.5 cc diesel, compressed air and CO₂ designs, a five-cylinder M-5, a Wankel, and a current K&B .61.

In addition to the model airplanes, the new exhibit has a recently restored 1929 Aeronca C-2. This 406-pound Aeronca was one of the first general aviation aircraft to find popularity among private owners, because of its low cost and safe design. "Flying" over the model planes is a modern, high aspect ratio Eipper Cumulus 10 hang

glider. It has a wingspan of 32 feet and weighs 41 pounds.

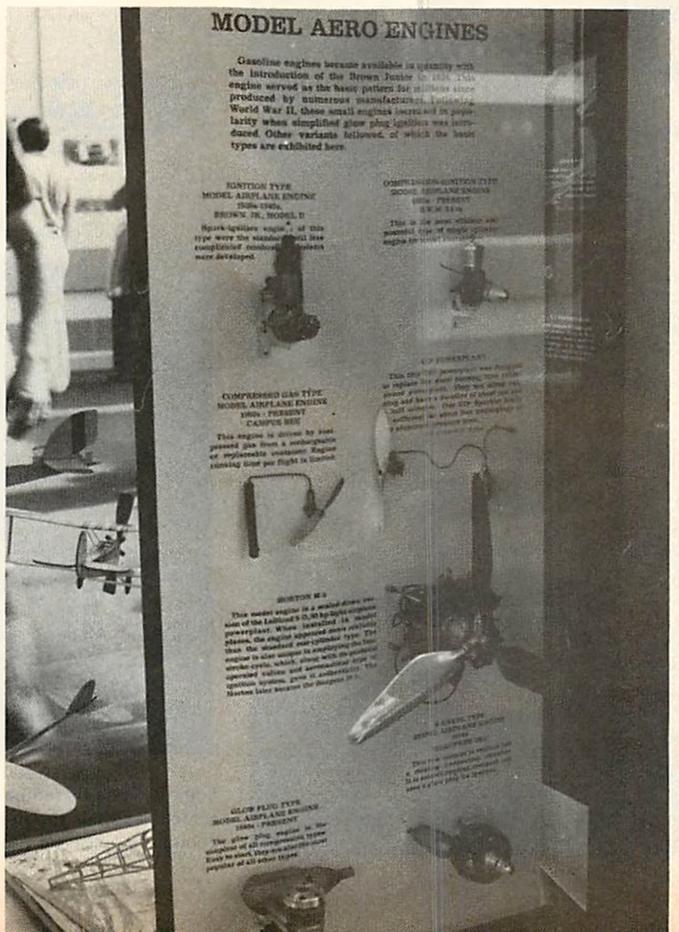
Last, but surely not least, the museum has just acquired that largest of all model airplanes—the Gossamer Condor. With a wingspan of 96 feet (longer than many commercial jetliners) it weighs only 70 pounds. This diaphanous man-powered craft successfully flew a one-mile figure 8 course on August 23, 1977, thereby winning the longstanding Kremer prize of 50,000 pounds sterling. After numerous serious attempts in the past twenty years had failed, many people had concluded that the Kremer one-mile figure 8 course was impossible to achieve by man power. Yet here is the overgrown indoor model that did it.

Now, more than ever before, a visit to the Smithsonian National Air and Space Museum is a necessity!



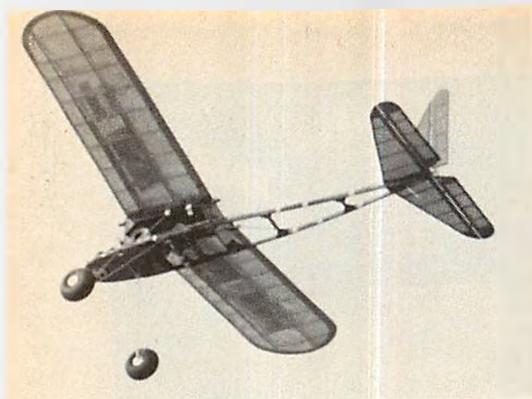
The Aquila sailplane, a modified Cox kit, (above) was used by Skip Miller to win the 1977 FAI Sailplane World Championships in South Africa. The model engine display (left) includes examples of both old and new designs.

FLYING MODELS



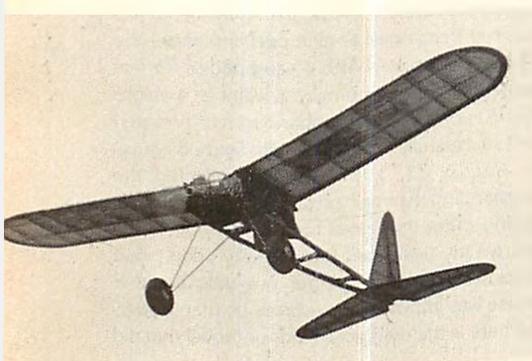
The Aquila sailplane, a modified Cox kit, (above) was used by Skip Miller to win the 1977 FAI Sailplane World Championships in South Africa. The model engine display (left) includes examples of both old and new designs.

FLYING MODELS



1936: It was a vintage year for FLYING ACES. Bill Effinger and Thracey Petrides dreamed up a super-simple stick design, still a classic after 42 years. An R/C natural/Hank Stumpf

FLYING ACES STICK



Here is the Granddaddy of all "STIK" type power models. It was designed in 1936 by two well known metropolitan New York area modelers, Bill Effinger and Thracey Petrides. Bill later went on to become the founder and president of the late and famous Berkeley Models of West Hempstead, N. Y. He now lives in New Jersey. Thracey graduated from N.Y. University in the Class of '42 with a degree in Aeronautical Engineering. His present whereabouts is unknown to us.

The first construction article for this model appeared in the April, 1936 issue of FLYING ACES magazine, the direct ancestor

of today's FLYING MODELS.

If nothing else, the Flying Aces stick gas model proves the old adage that there is nothing new under the sun. All the essential elements of today's stick type radio controlled models are there in easily recognizable form. No significant changes from the original model were required to adapt it for radio controlled operation. Now on with the job!

Construction

Start by building the wing. Prepare a wing rib template using plywood or sheet aluminum. Cut 17 ribs from $\frac{3}{32}$ " sheet balsa. Later



PHOTOGRAPHY: BOB ABERLE



Some designs are for the flying. Beautiful scale replicas can come later, they have to be admired too, but sometimes what you need is an ultra-easy aircraft that can get you in the air, fast enough, and long enough to polish up your flying skills. It's an aircraft you can complete in a week, a flying test bed.



take three of these ribs and cut them down to take the $\frac{1}{16}$ " center-section sheeting and the plywood dihedral braces. Cut two tip ribs to match the sections shown on the plans and you are ready to start assembly.

Select straight grained medium hard balsa $\frac{3}{8}$ " square for the leading edge and $\frac{1}{4}$ " x $\frac{1}{4}$ " tapered stock for the trailing edge. Use $\frac{1}{8}$ " x $\frac{1}{4}$ " spruce or rock hard balsa for the spars. Cut the tips from the $\frac{1}{4}$ " balsa sheet. Now assemble the wing halves and then join them using the $\frac{3}{32}$ " plywood dihedral braces.

After joining the wing, install $\frac{1}{16}$ " sheet balsa vertical grain webs between the spars

out to the fifth rib from the center. Complete the wing by covering the center-section with $\frac{1}{16}$ " sheet balsa and reinforcing the center-section trailing edge with $\frac{1}{8}$ " diameter dowel. Finish sand the completed wing with #150 sandpaper and put it aside for covering later. The resulting structure is light and yet possesses adequate strength for the rigors of R/C flying. The original completed wing weighed in at 8.5 ounces.

The fuselage structure is basically an open framework crutch constructed with $\frac{1}{4}$ " x $\frac{1}{2}$ " spruce longerons and cross braces with a $\frac{1}{2}$ " plywood engine mount plate. To this are added two $\frac{3}{16}$ " plywood formers and $\frac{1}{4}$ " x

$\frac{1}{2}$ " spruce wing mount rails. Be sure to use epoxy or white glue for spruce, do not use model airplane cement. Cut out and drill the engine mount plate to match your engine and install 4-40 blind nuts on the bottom side. To add some rigidity, there are numerous plywood gussets reinforcing the crutch joints. Don't underestimate the importance of the gussets in a structure of this type. They give it the ability to take twisting and bending loads it gets during flight and landing. The completed fuselage was stained with walnut stain and finished with two coats of urethane varnish which provides good protection from oil and fuel. Although the author left this area open for authenticity, the sides and bottom of the wing mount/crutch area between F-1 and F-2 may be covered with transparent Solar film or heavy celluloid to preserve the original open framework appearance while still protecting the radio equipment from possible oil and fuel damage.

The engine selected to power this old timer is the superlative Schneurle ported K&B .21, which is in the vanguard of up to date performance and design. Back in 1936, this airplane flew with a Brown .60 while now a .21 does the job with ease. Actually, you can use any engine from a hot .15 to a sport .35. Just remember to cut the fuselage mounting plate to match your engine. An SS-2 Sullivan tank is mounted sideways on the fuselage right behind the engine to complete the powerplant installation. For sport flying, I recommend a 9x4 wood prop and 5% nitro glow fuel.

The main landing gear is bent from $\frac{1}{8}$ " diameter wire with a $\frac{3}{32}$ " diameter wire brace. Bind these pieces together with copper wire and solder. Use balloon air wheels to give your model that authentic Old Timer look, such as the $3\frac{1}{2}$ " Trexler air wheels used on the author's model. Many hobby shops stock these wheels, but if all else fails, they can be ordered from Sig Mfg. Co. The landing gear is attached to the fuselage crutch with Midwest molded nylon wire landing gear clips.

The tail surfaces are constructed of balsa with $\frac{1}{4}$ " square leading and trailing edges, $\frac{1}{4}$ " x $\frac{1}{2}$ " spars, $\frac{1}{8}$ " x $\frac{1}{4}$ " sheet tips and stabilizer center. Join the elevator halves with $\frac{1}{4}$ " diameter dowel. Sand the pieces with #150 sandpaper rounding the leading and trailing edges and spars. Slit the spars to accept your hinges and epoxy them in place, being careful not to get epoxy in the actual hinge. Glue the fin to the stabilizer using $\frac{3}{8}$ " balsa triangle stock at the intersection for strength. Put the tail assembly away until you are ready to cover it.

Prepare the wing and tail surfaces for covering by applying one coat of Balsarite, and when thoroughly dry, sand lightly with #200 sandpaper. We used transparent orange MonoKote for the wing and transparent blue for the tail. This duplicates the colors used on the original model and complements the stained and varnished fuselage nicely.

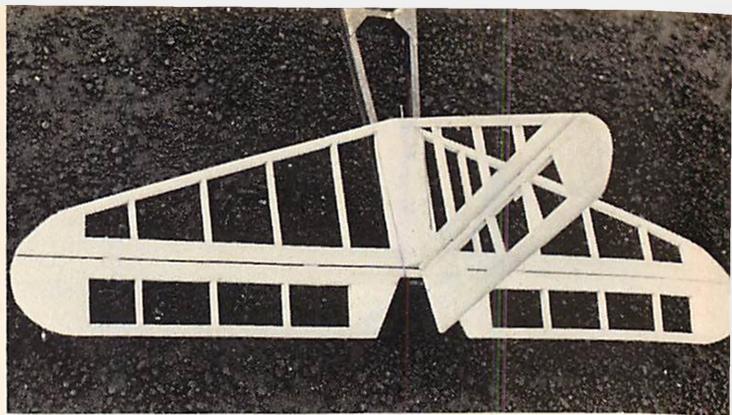
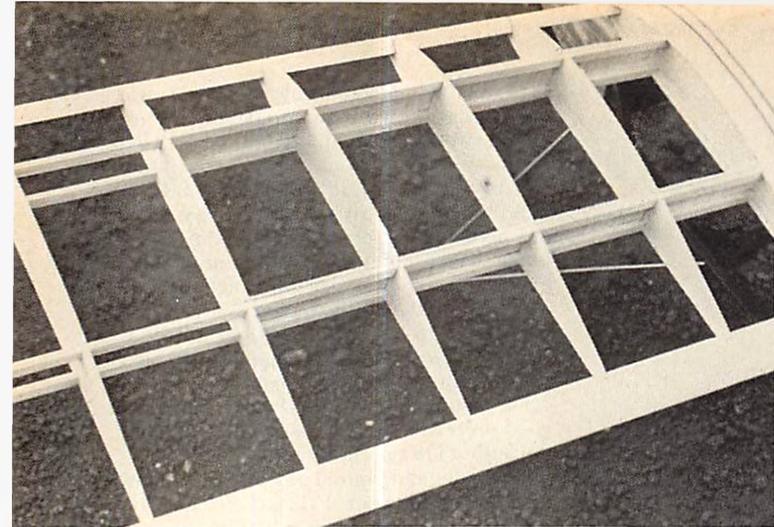
Radio Installation

The author installed a three channel Cirrus radio, but any three or more channel radio will do, since installation room is no problem.

All the radio equipment is installed in the area under the wing between fuselage formers F-1 and F-2. The battery and receiver are wrapped in foam and taped together and



Flying Aces, 1936. Those were the days. Fellows built a new ship every week, buses to the outskirts of town were full of newly doped aircraft. Hank Stumpf holds his replica. It's a fun machine to fly with a modern radio. **Beneath:** Naked framework won't frighten many builders, it will make a pretty good trainer.



Simple tail surfaces offer little in the way of problems, it's all routine. **Left:** Note the vertical grained spar web of balsa out to the fifth wing rib. **Left center:** The radio is a modern addition, instead of the ignition system. **At bottom:** How easily it all glues together. A quickly built flying machine.



strapped to the back of former F-1 with rubber bands. The three servos and the on-off switch are mounted on a servo tray which is screwed on to the two transverse rails on the fuselage crutch. Tape the excess radio and servo cable to the crutch to prevent them from flapping in the breeze. Two nyrods run from F-2 back along the top of the longerons to the rudder and elevator control horns. Use nylon reinforced scotch strapping tape to hold the nyrods to the longerons. The motor control runs forward through former F-1 and is also a Nyrod.

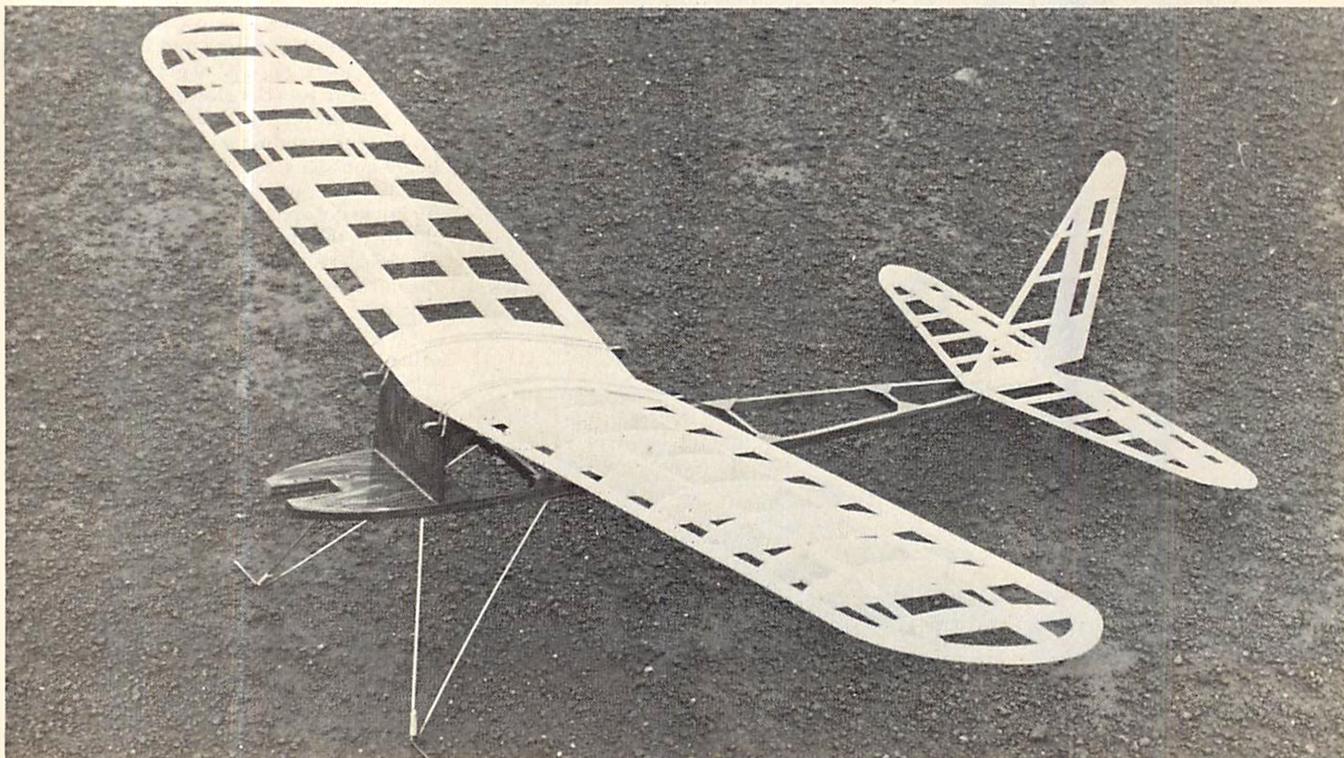
Flying Notes

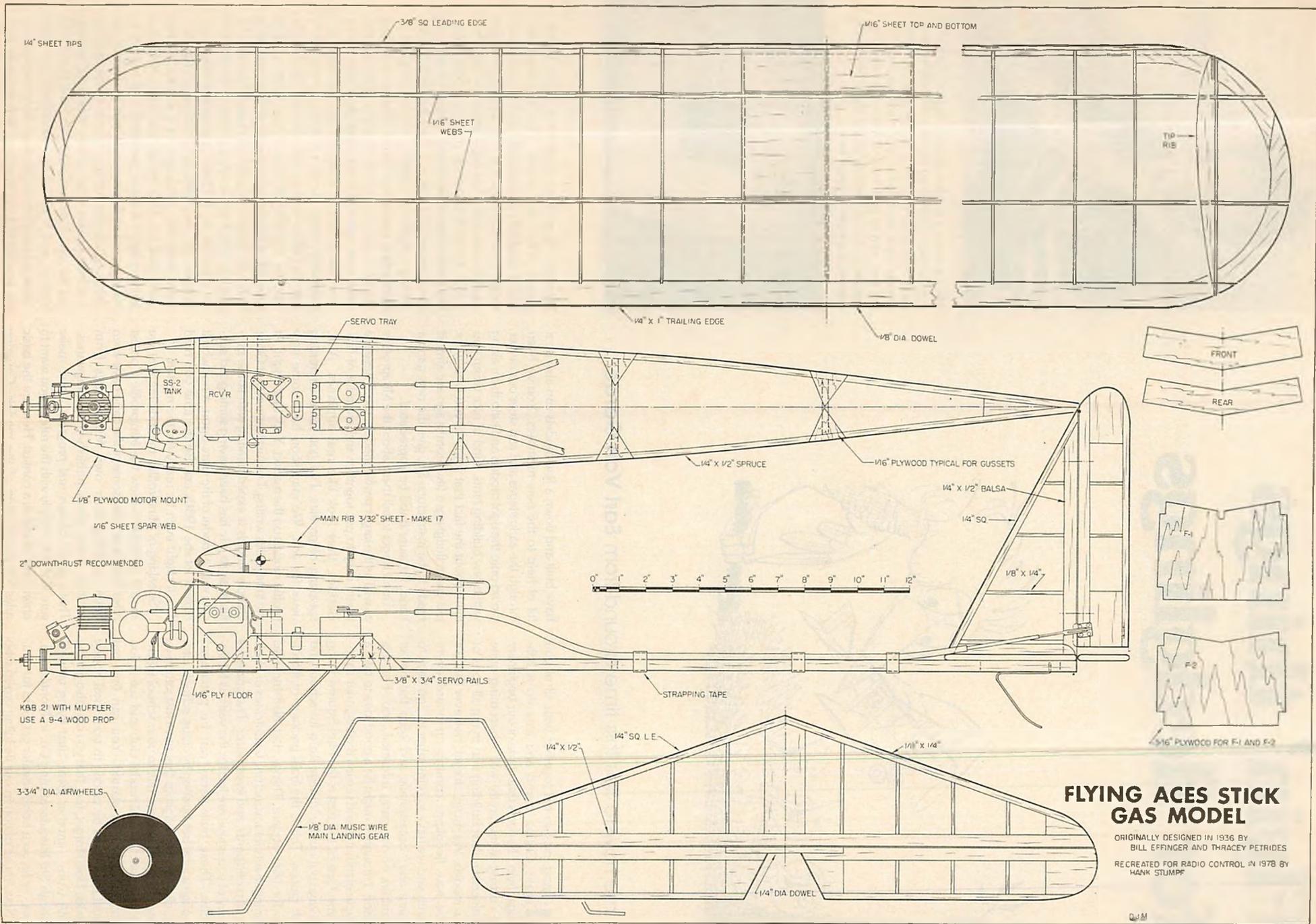
Check out operation of your radio installation thoroughly before bringing the model to the field for its first flight. Make sure everything works smoothly with the engine running. When you are satisfied, select a reasonably calm day (early mornings are usually a good time). The author recommends that the model ROG (if you never flew Free-Flight that means "Rise Off

Ground") instead of being hand launched. The large balloon wheels permit ROG's even off fairly rough grass fields. Be sure to go easy on the throttle as the K&B .21 has more than enough power for this aircraft.

The first two test flights were made by Glenn Spacht with your author joining in on the third flight after everything was trimmed out. Flight characteristics are straightforward and relatively docile. Low speed controllability is outstanding with speeds as low as 20 to 25 mph. Another pleasing aspect is the aircraft's lack of spiral diving tendencies, even in very tight turns. These old timers have a large amount of inherent stability due to the generous dihedral and tail moment arm, so if you get into trouble neutralizing the controls will give it a chance to recover by itself - presuming you have enough altitude.

Good luck with your Flying Aces Stick Gas Model. Let us hear from you and how you liked building and flying this truly historic model. How about it Bill Effinger? ☺





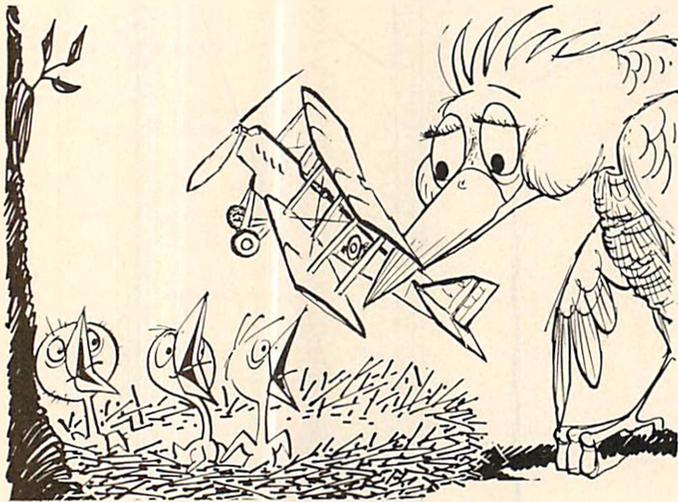
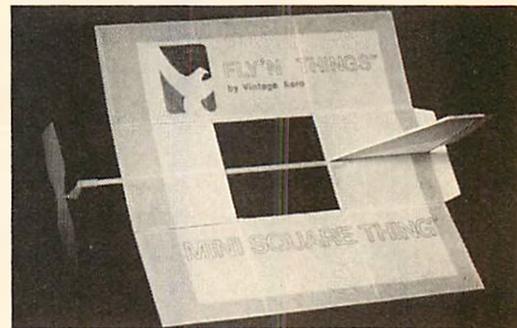
FLYING ACES STICK GAS MODEL

ORIGINALLY DESIGNED IN 1936 BY
 BILL EFFINGER AND THRACEY PETRIDES
 RECREATED FOR RADIO CONTROL IN 1978 BY
 HANK STUMPF

Flyin' things for fledglings



Ron Lawson of the Aeroplanes class at the Summer Science Workshop at the L.A. Science Museum modifies his X-18 to a butterfly tail. Mods usually hurt designed-in performance, but this one flew with no problems. The Mini-Square Thing (below) is one of the best of the basic beginners models. It's from Vintage Aero.



Some how-to tips this time around from Earl Van Gorder

Hi gang, nice to get together with all of you again. Gather round and let's do a little hangar flyin'. It seems that some of our beginners are coming along pretty well - becoming quite advanced in their building and trying all sorts of new models. We musn't forget, however that we have new fledglings coming on board every month and we have to remember to "go back to square one" occasionally and keep the newer members of our gang informed, too. For this reason, I thought it might be a good idea to take a couple of minutes and review the beginner's programs. One of the best is the Mini Square Thing package put out by Vintage Aero for school and club groups. This is the bulk package of fifteen kits for Mini Square Things that also includes training sheets for instructors, Certificates of Merit for all participants, and even prizes. The prizes, as many of you know, are kits for the various Miniprofiles. These bulk packs can be purchased through a local hobby shop by clubs, schools, etc. So, all you new fledglings that have just joined us here in the old hangar, talk to your school teachers or contact a local model club and see if you can get something started. You can find out about local clubs by talking to your local hobby dealer. Don't forget, too, that you can also get the AMA Cubs - another great "first flying model" through Sig Manufacturing Co. in Montezuma, Iowa - or let your hobby dealer get them for you.

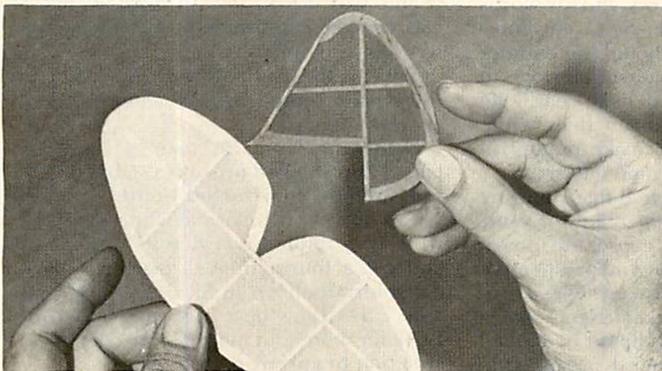
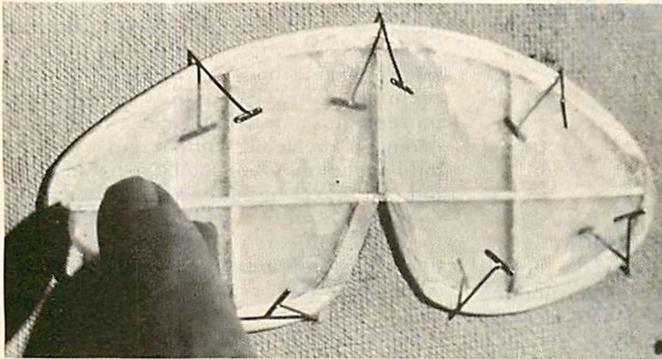
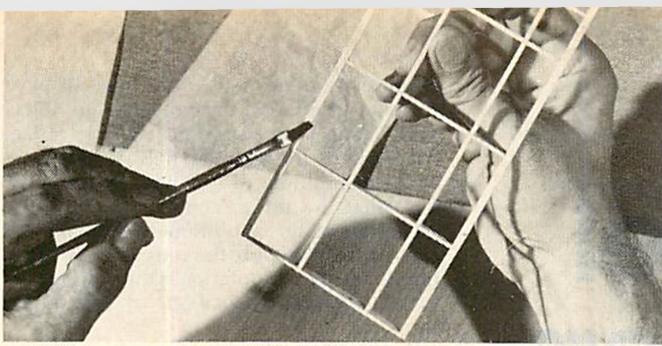
Now, those of you in our fledgling group who

have built and flown a few models can also be a lot of help to the new members. You've been through the early stages and can steer our newer crowd onto the right models and help them along with a few building hints. Kind of nice when you think about the fact that some of you who were just green fledglings a few months ago are almost ready to be instructors. So, give the new gang a hand. I'm sure it will be appreciated.

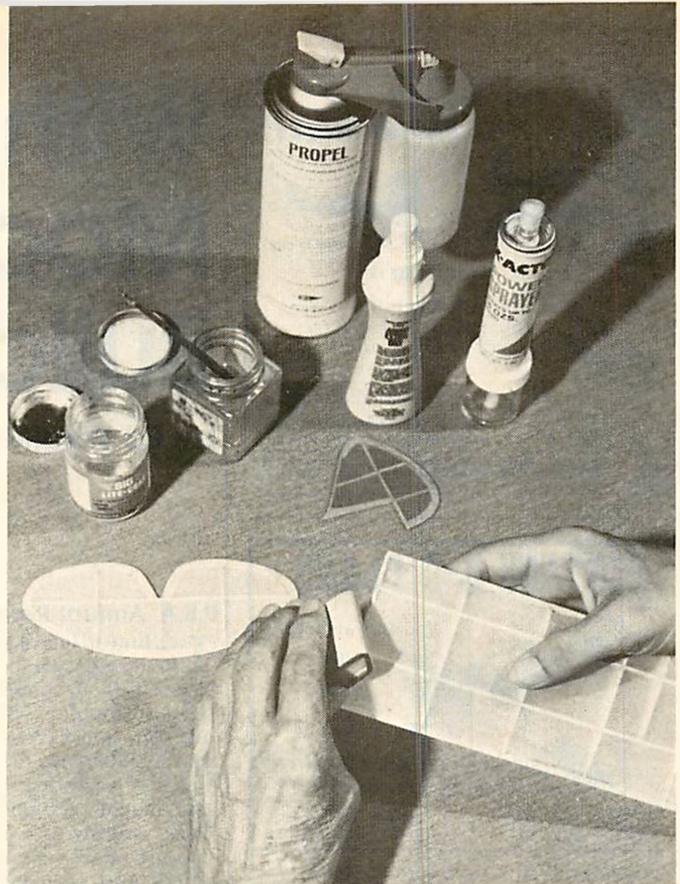
Don't forget to tell them about the Miniprofiles as well as the larger profile models, too. These are pretty easy to put together and are a lot of fun. Besides, they look like real airplanes. And, speaking of profiles, I've got some interesting news for you. We may soon have some new profile models on the market. Yep, that's right. At the time of this writing, I've just learned that Gene Dubois Models is experimenting with some profile designs. He has been having some good success with a model of the Gere Sport, a homebuilt biplane of the 1930s era. By the time you read this, it might even be ready for the market.

Speaking of Miniprofiles reminds me that we should, perhaps, review the Miniprofile Contest rules. I've heard that some of the gang have even been building their own Miniprofiles from scratch, using plans published in magazines. That's great! Shows real progress - but, make sure that you comply with the rules if you want to enter your model in a contest. Here are the basic rules for construction of the models: Covering

Material: All surfaces shall be covered with 9-pound onion skin paper. This is a tissue-like paper available at stationery stores, sometimes called second sheets. It is the same as the tissue used in beginner's kits and Miniprofile kits. Propeller: 4 3/4 inch freewheel plastic propeller only. No modifications permitted except to open up the freewheeling notch. It may be balanced by adding weight, like paint - but no scraping or trimming is permitted. Thrust bearing, shaft and thrust washers: Thrust bearing shall be the Stick-type nylon or other plastic and may not be modified except to bend the end for thrust adjustments. Metal thrust washers are permitted, but no Teflon washers are allowed. Prop shafts may be commercial type or bent from suitable wire. All of the foregoing small parts are available in hobby shops. Wheels and Landing Gear: All models shall have landing gear and wheels and be capable of R.O.G. (unassisted take-off). Wheels can be plastic or hardwood in approximate scale size. Minimum wire size for landing gear shall be .025 inches diameter. Retracted landing gears are not permitted - all models to have extended, fixed gear. Wood: No restrictions on wood except that the minimum size shall be 1/16-inch square strips. Sheet balsa only permitted for minor curved parts, like wing tips, or tail curves, and shall be 1/16-inch thick. No sheet balsa tail surfaces are allowed. Frameworks may be sanded but must remain slightly larger than



PHOTOGRAPHY: JACK ARNOUTS



Putting the 50/50 dope mixture (top left) on a wing frame prior to applying the tissue. Those are Van's hands, he really does build them. A water sprayed surface being pinned down to dry (middle left). Note that the pins do not actually perforate the surface. The finished tail surfaces (left). Note that the fine water spray has made the tissue drum-tight and the fact that they were pinned down while drying has kept them warp-free. Cutting the tissue clean at the edges using a sanding block (above). In the background are three types of inexpensive spraying gadgets. The least expensive, and it works beautifully, is the deodorant spray bottle.

you build a model from scratch, make sure you apply all the above rules. It's no fun to do a good building job and then not be able to qualify the model for a contest.

Covering

Now, as I mentioned, some of our modelers have progressed to regular scale-type kits. Some have had a little trouble with covering and have asked me for a few tips. I want you to understand that I don't consider myself an expert, and some modelers may differ with my ideas - but, I'm passing on what has always worked well for me.

When covering with Japanese tissue (sometimes it is produced in Japan and sometimes right here in the old U.S.A. but it is all generally referred to as Japanese tissue) the first thing to do is find which way the grain runs in the paper. Sometimes you can see the grain by holding up to a light, but you can always tell by tearing. A small tear in a corner will reveal that it tears easily in one direction and does not want to tear straight in the other. The smooth tear is the direction of the grain. Before starting to apply the tissue, sand your frames lightly to make sure there are no rough spots or protrusions. Then, give the frames a coat of dope mixed 50-50 with thinner. Now you are ready to apply the tissue. Japanese tissue cannot be applied wet. It will come apart in your fingers, so you put it on dry. Cut a piece about a

$\frac{1}{20}$ th square to qualify. Okay, gang, that's it. If little larger than the section you are going to cover - here is where the grain is important. The grain in the paper should always run lengthwise of the part being covered. In other words, the grain should run from tip to tip on a wing and from front to rear on a fuselage. Your tissue can be adhered to the frame with the same 50/50 dope mix which you previously coated the frames with or, you can also use a mix of white glue and water - also in a 50/50 proportion. Apply the tissue and, working very carefully, try to pull out as many wrinkles as possible. After all edges are sealed well and have dried, you can trim off the excess. This can be done with scissors or your modeling knife, but the way that works best for me is to sand the edge lightly with fine sandpaper which cuts the tissue right at the edge and leaves a smooth edge.

Now you are ready to shrink the tissue tight by spraying with water. If your frame is very light and delicate, I'd recommend spraying with denatured alcohol to prevent warping. There are several rather inexpensive aerosol spray outfits on the market, but the least expensive way to spray is to use an atomizer. This can be easily obtained by saving an empty pump-type container that held deodorant, hair spray, or whatever. Clean this unit out well with soap and water, rinse thoroughly and let dry out well. You now have a pump sprayer that will last you for years and work very well. Use this to spray your surfaces after

they are covered. Just get them damp - don't try to saturate them. Some delicate parts, like tail surfaces, should be pinned down during the drying process to prevent warping. When all surfaces are dry, you can give them a coat of the 50/50 mix of dope and thinner, if you wish. Flat surfaces can usually be covered in larger pieces of tissue, but curved fuselages should be done in smaller sections to get a neat job and prevent wrinkles. Wings can usually be done in one piece with the possible exception of the tips which might require a small separate piece of tissue.

Work carefully, don't try to rush the job and you should come out with a well-covered model that is free of unsightly wrinkles and will earn you some expressions of congratulations from your fellow modelers.

Well, it looks like it's about time to wind up this session, but before we close the hangar doors, I want to remind all of you to be sure to drop me a line and let me know what you're doing. Let's hear from you guys and gals so I can get your news into the column. All the rest of our fledglings around the country want to know what you're doing. Just send me the "dope" along with a photo or two (black and white) if you have them. So, remember, drop a line to E.R. "Van" Van-Gorder, 10 Brothers Road, Wappingers Falls, N.Y. 12590. So-long for now. I'll be watching my mailbox until we get together again next month.

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With Model Builders

by Ed Whalley

U.S.A. Annual Reflects Trends

It's time to take a good look at the records to see what can be done about trimming down a little to conform with what seems to be most popular with the flyers that turn out." The speaker was Noel Hess, prexy of the Utah State Aeromodelers, and his words came in the aftermath of the Salt Lake club's 19th Annual. "Expenses should come under closer scrutiny to see what can be done to make it more economical next year," he added. And Noel pointed out that, while their purpose was not to make money, it would be "real nice" to come out even.

Others were quick to agree that sponsors on whom the club had depended for years were becoming somewhat cool to the idea of coming up with a donation. And prospective sponsors had flatly refused when approached. Everyone acknowledged that a problem exists and that it should be looked into before next year's contest season. One side of the coin is the problem of getting sponsors; the other, justifying the inclusion of events on the card.

"Most all Controline events were down this year," said Jim Rhoades, CL vice-president. But he was quick to point out that this was partly due to the absence of several flyers who customarily enter four or five events. But there's no flinching that, when a meet with the stature of the Salt Lake Annual cards events which draw only two or four entrants, there's something wrong. And this despite some darned good flying by those who showed up.

Free-Flight ran for two days as opposed to the one day of Controline flying. And while Jon Zeisloft termed the meet "a success," a perusal of the results indicates that it was basically the same field competing in every event. At least three events seem to have had only two entrants, too. The fine weather and the quality of the flying may have made the segment "a success," but these last events serve only to underscore Hess's comment about "trimming down."

Bob Sward and his wife have been the registrars of the Annual for nearly a decade, and Bob wondered if the emphasis implicit in the title wasn't a bit misplaced. "The term 'show' in the title 'Model Air Show' implies that there is something entertaining in store for the public. But unless you're a miniature aircraft enthusiast or a member of your family is one, the bulk of our 'show' seems rather boring," he said. He admitted that a few of the R/C and Controline events were exceptions. "But to appreciate the remaining

events," he continued, "you have to have some knowledge of their details and objectives." If nothing else, Bob's remarks reflect the view of the general public and tie-in with the problem of getting sponsors. Bob feels that the term "contest" would more accurately reflect the intent of the club and zero-in on the people the activity is aimed at. Implicit in this orientation is the willingness to scale-down expectations of community support.

But there are others who see things differently. They persist in viewing a meet, by any name, as a "both/and" rather than an "either/or" situation. To them the "show" aspect presents both a challenge and an opportunity. The challenge is to make the presentation interesting and entertaining enough to create a PR opportunity. And the public relations effort should redound in the form of increased public support. It's all in your point of view. But it's no fluke that all of the U.S.A. officers went out of their way to thank "the individuals and small businesses who contributed" as trophy and event sponsors.

No one mentioned it specifically, but it would appear that the Junior entry in all events was down, too. In most events, all classes were combined; in the others, entry was low. But, in both Controline and FF, the quality of the competition was good. And there were some surprises and innovations as well.

Remember Ron St. Jean of "Ramrod" fame? Ron showed up with a stable of Ramrod spinoffs constructed entirely of foam with a skin of Silkspan and white glue. They were very impressive. Ron took 1/2A and B and got a fourth in A.L. St. Jean (son or daughter?) took 1/2A Jr./Sr. with a very creditable 7:54. Ron's best time was 14:49 in B. Look for more and more of this type of construction to appear on the scene.

The race in B, by the way, was quite close: Ron King was second in 14:47; Jay Jackson, third, with 14:18. Jackson had wins in both Coupe (4:19) and Mulvihill (9:45). Carter Watts gave him some close competition by coming second in both events with 4:17 and 9:28 respectively. Kit Taft swept the other "silent" events with well earned wins in P-30, A/1 and A/2 Nordic, and Handlaunch. Watts came back to win both B and C Gas; Jackson, to take OT Cabin and Replica. There was a good field in Replica, and Jon Zeisloft pushed Jay hard. Jackson's time was 7:57; Zeisloft's, 6:37. Caylord Krikham was down from Grand Junction and competed in both Controline and FF, picking up places in both. He had seconds in Hand-launch and FF Scale, an event won by—guess who?—why, Noel Hess, of course.

Hess also won in ukei Scale—with Kirkham again second. A couple of guys had pretty good days: Clete Binney had wins in Scale Racing and Slow Rat, a third in Slow Combat; Kirk Robinson won in Stunt and Balloon Bust. Binney gave Robinson a hard time in Bustin' but finished second. Jim Rhoades took Speed with 86.67% of record. And Dave Spencer took Combat. Looks like Binney would have to be king o' the hill in the CL segment.

No matter how you look at it, the Annual continues to be one of the best meets in the Intermountain area. We look for the 20th Annual to be one of the best ever. Whatever the problems, whatever the trends, the U.S.A. boys will adapt to them and continue a proud tradition.

FF Team Named

The first report reaching us on the Team Selection Finals at Taft over Labor Day comes to us from Irv Aker via the T-Bugs bulletin. From the looks of things, the meet went smoothly enough with typical Taft weather on the first two days and a surprise rain on the third. Flying started at 6:20 in the morning on each day with the Power boys having the early go on Saturday; the Nordic boys on Sunday; and, the Wake flyers on Monday. On Monday, the temperature dropped from 100-plus to around 65 with accompanying rain.

The Power boys were the least affected by the early-morning 4:00 round. Everyone got off his flight within the 15-minute time frame. No one in Nordic made all 18 maxes, and those who minimized their mistakes on the 3:00 flights were able to capitalize on the 4:00's. Surprisingly, Wakefield performance in the Monday weather was better than in the heat. More maxes were logged. All of which led Irv to some conclusions:

1. In both Wake and Nordic, you can't win unless you can make the four-minute flight or at least get a large portion of it.
2. In Power, most flyers can make four minutes, and the winners are those who make the fewest mistakes.
3. The weather change should contribute toward a stronger Team since it forced the competitors to adjust to adverse conditions.

When the meet was over, the following had earned places on the FF Team: Wakefield—Walt Ghio, Bob Piserchio, Bob White; Nordic—Bob Isaacson, Jim Wilson, Lee Hines; Power—Carl Bogart, Roger Simpson, Doug Galbreath. It looks like a pretty good Team to this reporter.

WAM Notes

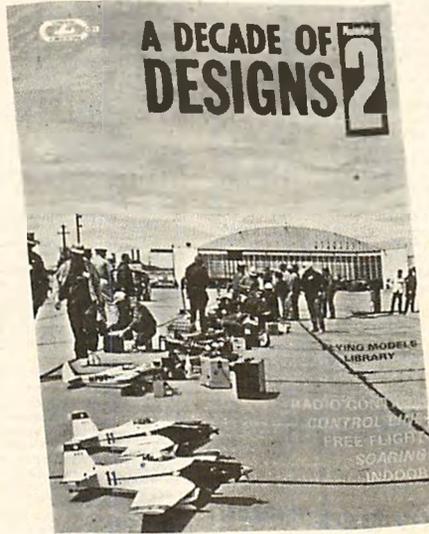
- At last report, there were 225 clubs in the WAM family with 3245 insured members. Mom Coad and the slate of officers headed by prexy Mary Carpenter must be doing something right. Incidentally, the 30th Annual Parade of Champions and annual general meeting is all set for Jan. 13th at the Concord Inn in Concord, Cal. It'll be your choice of entrees—beef or chicken. Beef is ten bucks; chicken, nine. And WAM will pick-up one buck of the tab on every novice reservation. Good deal!
- WAM's just done something that a lot of groups are doing; they've amended their constitution to the end that the V.P. will serve as Chairman of the Board of Directors. For one thing, it will enable the President to take part in the proceedings at meetings without first having to relinquish the chair. The move gives a president more of a shot at leadership.
- The Concord Model Engineers' 22nd Annual brought out a large percentage of multiple-event flyers, some of them competing in surprisingly dissimilar events: Bob Boling, for example, a Balloon and Carrier expert, also entered 1/2A Mouse; He entered 10-Mile, too. Doug Hinckley and Ron Perry, Speed merchants, also got into Mouse (Perry won; Hinckley seconded) and Glider. Scaleman Gary Whaley got into Mouse, too—as well as Air Race. Jose Martinez entered Mouse, Glider, Speed and Ten-Mile. Note that what they all had in common was 1/2A Mouse. Just goes to show ya—if you want an event to be popular, make it simple and make it cheap. Everyone's got a 1/2A mill around.

In the flying proper, Don Chandler and

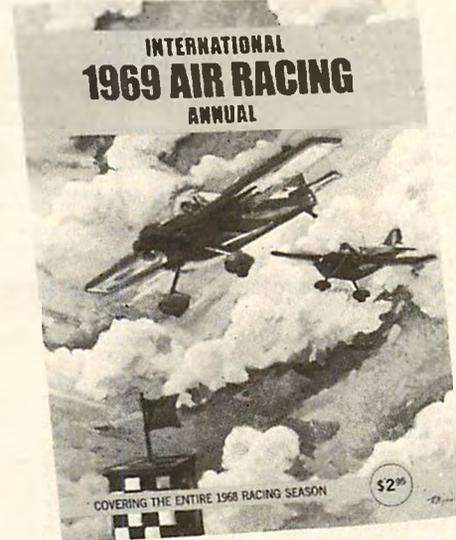
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CF-57 SPAD SV-2 World War I fighter By Paul Paolone
FM 5-64 09 mid 43 span R/C \$3.50
CF-64 GYPSY MOTH DEHAVILLAND 68" wing 60-71 bi-
plane 3 sheets By Elmer Nowak R/C FM 4-62 \$4.00
CF-66 WACO W. Tricycle gear biplane 09-15 R/C with
40" span FM 1-61 By Nick Zirol \$2.00
CF-81 FOKKER D.VIII 60" span R/C World War I biplane
1/4 scale 61 mil Nick Zirol FM 6-67 \$3.00
CF-83 GRUMMAN GOC-AT Duster biplane 1 1/2 scale
35" 40" 23" by Bob Adams FM 6-67 \$3.00
CF-85 BEECHERCA 51" German monowheel 1 1/2 scale
for 60 R/C By Bryce Petersen FM 7-67 \$3.00
CF-89 FAIRCHILD PT-19 Low wing airplane 62" span
for 49 R/C By Gene Rogers FM 8-67 \$4.50
CF-93 FOKKER DR-I WWI triplane for 53 61 48" wing
R/C By Bryce Petersen FM 10-67 \$3.00
CF-97 MORANE SAULNIER 10" 1915 variation near-scale
55" span 35 Nick Zirol FM 10-67 \$3.00
CF-104 3 E. J.amed British WWI lighter biplane 51-2
scale 61.5" span R/C 1-68 By Nick Zirol R/C \$3.50
CF-109 FAL RHETS Goodyear racer 1st at 67 NATS
FM 2-68 By Joe Foster By Nick Zirol \$2.00
CF-114 EINDECKER E-111 German monowheel 55" span
uses 35 Nick Zirol R/C 3-68 R/C \$3.00
CF-122 EL BRONCO R/C sport tail dragger for bi mil
with 66" span By Wally Zuber FM 9-70 \$3.00

CF-364 EAA HEADWIND Brilliant stand-off scale R/C for
15 engines 48" span by Al 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 \$3.00
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 Zirol FM 10-75 \$3.50
CF-380 BD-5 Stand-Off Scale R/C for 19 to 35 engines
60" span Bob Aberle FM 9-75 \$3.50
CF-389 HEINRICH He-162 Stand-Off Scale R/C with 55
span for Scozzi 40 Turb Ax 1 ducted fan Nick Zirol FM
11-75 \$5.00
CF-391 SOPWITH PUP Stand-Off Scale R/C WWI biplane
with 50" span 60 engine Jerry Pulido FM 12-75 \$5.00
CF-396 DEWITTINE D-510 Stand-Off Scale R/C with 59"
span 40 60 engine Alan Spevack 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 I R/C Scale with 61"
span for Reiss 61 engine Tony Eck FM 3-76 \$5.00
CF-402 AG "WARHAWK" R/C Stand-Off Scale 56" span
60 engine Dan Reiss FM 4-76 \$3.00
CF-406 BOULTON PAUL DEFIANE 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 40 MONOPLANE 020 powered 76" wing
R/C or F/F 38" span Hurst G Bowers FM 8-76 \$2.00
CF-418 MONOPLANE 50A Stand-Off Scale R/C classic with
72" span for 45 engine Frank Dellamura FM 9-76 \$6.00
CF-425 DEWITTINE D-520 R/C Stand-Off Scale WWI 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 "JAHATE" 54" span Stand-Off
Scale R/C for 60 engines C. A. Austin FM 3-77 \$3.50
CF-441 BERG O. AVIATIK II Austrian WWI SOS R/C Bipe
with 40" span for 35 to 40s Frank Dellamura FM
6-77 \$3.50
CF-446 FOKKER T-2 Stand-Off Scale R/C with 61-inch
wingspan for 40 to 60 engines Don Martin FM
7-77 \$3.50
CF-452 DOUGLAS A-1H SKYRAIDER Stand-Off Scale R/C
for 60 engines with a 58" span. Rolled plywood fuselage
FM 10-77 \$3.50
CF-454 DC-3 SOS R/C twin for two 45 engines with a 96"
wingspan Tony Lombardo FM 11-77 \$5.00
CF-462 CP-65 PORTERFIELD COLLEGIATE SOS R/C ship
with 74" span for 35 to 45 engines D.B. Matthews FM
2-78 \$5.00

CF-238 BEHEMOTH Giant 1 1/4 Tail craft Takes 29 to
60 By Humphries FM 9-71 \$3.50
CF-239 INDI 500 A maneuvering R/C monster Inalitt
deliver pattern performance Jack Sheeks original has
61 Merco and EM Logcraft FM 10-71 \$3.50
CF-249 INTIMIDATOR RC pattern ship for 60 7-1/2 lbs
By Marly Meyer FM 10-71 \$3.00
CF-252 D.O.T. Sport R/C design easy and cheap 15-23
Jack Sheeks, Jerry Caldwell and FAI Pylon Racer \$2.00
CF-255 XP 400 Formula II and FAI Pylon Racer 56"
span 40 Dave Gierke FM 3-72 \$3.50
CF-256 SPANIER Sport R/C twin 2nd channel 42" span
for 049 to 15 By Gene Rogers FM 3-72 \$2.00
CF-261 AERODIE R/C sport 61" span K&B 40
Johnston FM 4-71 \$3.00
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 \$2.00
CF-269 FAIRWEATHER 65" span R/C pattern ship 61" power
retract landing gear Bob Caplan design FM 7-72
\$5.00
CF-270 ESCAPEE R/C tail dragger with Goldberg re-
tracts 60 engine Gene Rogers FM 8-72 \$3.50
CF-272 HAWK R/C 60 engine Phy and Ioam
construction Dick Sarpolus FM 8-72 \$3.50
CF-289 ME-109 1/4 mid glen pylon racer 391" span Super
Lite 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 TH-100 Allimeter equipped R/C trainer with
Enya 45s Orbi R/C span 62" McGovern FM 7-72
\$2.50
CF-293 BLUE FLAME Open pylon racer R/C 54" span
505 sq in Super Lite 40 ABC Dave Gierke FM
4-73 \$3.50
CF-298 WOODROCK R/C Pattern Delta with 44" span 46
length Enya 45 Lou Cabulos FM 6-73 \$3.50
CF-299 CUL 66" span R/C sport for easy flying Fox
Eagle 60 and MRC 110 R/C Unusual wing By Dick John-
son FM 6-73 \$3.50
CF-303 TAILGATER R/C pattern ship 63" span Weira 61"
Pro Line radio Rcm wir retract 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-Pylon 60 engine
Gene Rogers FM 9-74 \$3.50
CF-340 LIT SPECIAL 1/4 R/C Pylon Racer for Cox Tee-
Dye 430 31" wingspan V. Caloum FM 8-74 \$2.00
CF-367 "NOTHIN' SPECIAL" 1/4 R/V tailed pylon racer
with 27" span Bob Aberle FM 7-75 \$2.50
CF-383 FLICON R/C Pattern Trainer using Falcon wing kit
40 to 46 engines Vance Calouni FM 9-75 \$3.50
CF-405 76 SPECIAL Quarter Midgl 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
mill engine and Cannon Tiny R/C 22" span Bob Aberle FM
5-76 \$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
19-26 engines Gene Weaver FM 10-76 \$3.50
CF-436 WREN R/C Sport biplane for 15-19 engines 38"
span Howie Applegate FM 12-76 \$3.50
CF-429 INDI RE-TRAINER Sport R/C with a 50" span for
40 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 BIPED 48" span R/C Sport Biplane for
60 engines Dan Reiss FM 4-77 \$3.50
CF-438 REISS' RODSTER R/C Sport Biplane for 60 engines
Dan Reiss FM 5-77 \$3.50
CF-442 LIT EAGLET O10 Sport R/C with 22" wingspan
for mini radios and Cox O10 Bob Aberle FM 6-77 \$2.00
CF-451 DOUBLE TROUBLE Pattern Biplane for R/C and
60 engines with a 54" wingspan Dick Sarpolus FM
9-77 \$3.50
CF-455 BI-BABY R/C Sport Biplane for 29 to 40 engines
Jack Sheeks FM 11-77 \$2.50
CF-456 THE ACE THREE-TEM 3-channel R/C trainer with a
36" wingspan for 09 and 10 engines Bob Aberle 12-
77 \$2.50
CF-458 THE CHALLENGER A twin-boomed 60 powered
R/C pattern ship with a 62 wingspan Bob Godfrey FM
1-78 \$2.50
CF-459 THE HUNGRY EAGLE An R/C duration model
(looks like a F F ship) for 40s with a 96 span Dick Sar-
polus FM 1-78 \$3.50

CF-176 SCARAB A-2 Nordic P/H with 79" span Fiberglass
fishing rod fuselage By Dick Mathis FM 10 69 \$2.00
CF-179 U S KID LONG 31" span Three hand launched 38"
gliders by Jay Mathis Paddon Great Fun 7-70 \$3.00
CF-189 INVADER 15 35 powered sailplane 73-1/2" wing
By Gene Rogers FM 7-70 \$3.00
CF-194 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
fiberglass fuselage By Carl Lorber FM 2-71 \$4.50
CF-205 HYSTERIA 1000 Class C/F 84" 40 1000 sq in
wing area By Jim Burgette FM 3-71 \$2.00
CF-207 GOb A/1 Nordic with Jeddely 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 ATENA 80" span Nordic A/2 Class Iuse Open
class winner for 1970 By Gene Rogers FM 3-67 \$2.00
CF-233 LEAD ZEPPELIN Sisk A/2 Nordic Iuse light 88"
span Tom Hutchinson FM 8-71 \$2.00
CF-243 YANKEE SOAR 16 1/2 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
fiberglass fuselage By K. Williams FM 11-71 \$2.00
CF-250 PAMPER 25" R/C trainer FM 7-72 \$3.50
CF-256 THERMAL HOPPER 170" span FAI R/C sailplane
British design with rudder, elevator, spoilers/lowhook
micrologic gear/Dallmer FM 6-72 \$2.00
CF-275 QUASAR R/C soarer with 146" wingspan
By Neil Liptak FM 9-72 \$6.00
CF-276 SPIRIT OF FREEDOM Gracelut 118" radio con-
trolled soarer Harry Michaels FM 10-72 \$3.50
CF-280 ILLUSION 120" span R/C wing soarer for towing
wings plane FM 11-72 \$3.50
CF-292 BANGLI Giant 50" span catapult glider By Mike
Alwood Free Flight FM 3-73 \$3.50
CF-306 UNDERDOG Handlaunch glider design by Harry
Kuse 19" span FM 8-73 \$1.50
CF-314 THERMUS "Catapult glider 36" span
Bob Adams 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 lifts into a suitcase Don McGovern FM 7-74 \$3.50
CF-343 FACE SAVER Handlaunch Glider for rough wind
36" span Larry Kuse FM 8-74 \$2.00
CF-359 "SPOT RACER" 100" span R/C soarer with 60s
in area Harry Michaels FM 7-75 \$3.50
CF-369 "BOMBLE" 114s R/C soarer with lull wing
Peter Kem FM 5-75 \$4.00
CF-372 THE WEIRD ONE 119" R/C canard soarer by Dick
Sarpolus and Anne Peterson FM 6-75 \$3.50
CF-378 OCHERLE Nordic A/2 with 70" span
Dave Linstrom FM 8-75 \$2.00
CF-379 EYECORE 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 38 1/2" wingspan and a
normal disposition Howie Applegate FM 10-75 \$3.50
CF-401 BACKLASH Catapult Glider with 24" span Larry
Kuse FM 3-76 \$2.00
CF-408 "DESPERATION" A/1 Nordic glider 48"
span Bruce and D.B. Matthews FM 6-76 \$2.00
CF-424 BLOOMBER 78" span Nordic A/2 competition
glider Joe Slonek Slovacke FM 12-76 \$2.50
CF-412 LARS Long Islander Ratio Sailplane R/C 74"
span Dick Sarpolus FM 9-76 \$3.50
CF-422 THE LIGHTLEIGH 100" span R/C soaring glider
by Howie Applegate FM 11-76 \$3.50
CF-443 MOJAVE A/2 NORDIC A/2 Nordic Free Flyer
with an 85" span Polish power glider FM 6-77 \$3.50
CF-448 OGAR A SOS Polish powered glider for 049 en-
gines with a 72-inch wingspan Howie Applegate FM
8-77 \$2.50

CF-6 SCAVENGER Amphibious R/C flying boat for 35-
60 engine 77" wing Don McGovern FM 8-62 \$5.00
CF-30 SKIPIACK R/C 35 seaplane with one large float
two smaller 50" span Paul Hook FM 1-71 \$3.50
CF-63 PIRANHA 74" span seaplane for 56 eng 1/2 scale
practicality FM 12-66 By McGovern \$4.00
CF-75 DORNIER DO-18K1 66" span R/C 19-29 twin
engines in tandem flying boat By A Swanson \$7.00
CF-76 SEA HORSE R/C seaplane twin float amphib for
45 67 engine 51-67 McGovern \$3.00
CF-86 MAKO Midget R/C seaplane 45 mil Another
McGovern original FM 7-67 \$4.00
CF-94 UNSINKABLES Foam floats converts big models
to ROW Gene Rogers FM 9-67 \$2.00
CF-123 KODABURA 72" span seaplane for 45
William Axts FM 6-65 \$4.00
CF-132 GRUMMAN WIGGON R/C scale flying boat for 45
Ingen Oscar Weingart FM 9-68 \$5.00
CF-150 MORAY MONSTER 72" R/C flying boat with re-
tracting floats for 60 Don McGovern FM 1-69 \$5.00
CF-168 SCAMPI 63" span flying boat for 56 R/C 50
Holland Willem Axts FM 6-69 \$3.50
CF-171 ENGIN 60" span R/C float plane uses Enya 45
Gene Rogers FM 8-69 \$3.00
CF-199 SAVOIA-MARCHETTI Twin hull C/L semi-scale
1933 flying boat Mate it R/C Sarpolus & Shubel FM
9-70 \$5.00
CF-111 EDD FLOATS Semi-scale floats for ROW craft con-
vert your land plane By Axts FM 3-67 \$1.50
CF-247 LAKE BUCCANER Semi-scale R/C flying boat
15-19 pusher By Dave Ramsey FM 12-71 \$3.50
CF-263 MADGE FLYING BOAT 3 channel R/C for 29 45
mil with 57" span Brent Pusch FM 5-72 \$2.00
CF-290 FALCONER R/C semi-scale amphibian 71"
span 45-60 engine By Don Prentice FM 3-73 \$5.00
CF-361 SEAWEED R/C seaplane with 65" span 60 en-
gine Bob Aberle FM 3-75 \$2.00
CF-393 VIKING Record setting R/C seaplane for 35-60
engine 77" span Bryce Peterson FM 1-76 \$3.50
CF-450 THE SEE BEE 3/4 scale camera plane for R/C with a 42"
wingspan Dave Kalagiri FM 9-77 \$2.50

R/C SEAPLANES

CF-1 SPOTTER A/2 Nordic with 79" two piece wing By
Joe Bilger FM 4-65 \$3.00
CF-14 SEAGULL Giant 84" wingspread soarer R/C with
supplementary 09-15 power Don McGovern FM 8-62
\$6.00
CF-16 THERMAL QUONER Radio control soarer uses Ep-
pler 385 airfoil 144" span with light wing loading By Carl
Lorber FM 11-70 \$3.00
CF-20 LIT R/C 74" glider rudder only with T tail
By Bob Hahn FM 6-65 \$4.00
CF-34 SCHWABER 126 R/C 1/6 scale glider with 67
inch canopy By Dan Lutz FM 4-66 \$2.00
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 com-
petition glider By Joe Bilger FM 7-66 \$2.50
CF-46 MINSBY 149 R/C 119" span high aspect ratio
R/C slope or thermal lift Achey FM 8-66 \$4.00
CF-65 FOAM'S HAIR WING R/C modern foam wing soarer
By Rollin McPherson 72" span \$3.00
CF-69 BOMB BOMBER FAI R/C glider one time world re-
cord altitude holder Maynard Hill 136" FM 2-67 \$4.00
CF-70 THUNDERHEAD 54" span foalme trainer By Don
McGovern \$3.00
CF-88 SOAR SAM A/1 Nordic for NATS etc 48" span
By Bill Dunwoody FM 7-67 \$2.00
CF-93 1931 NORTHROP PRIMARY TRAINER 72" span R/C
glider 1/4 scale By Marly Meyer FM 1-69 \$3.50
CF-99 PERIGRENE 89" span A/2 Nordic with fiberglass
fishing rod fuselage 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 HERRICK 149 R/C Nordic A/2 Nordic with 47 1/2
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-120 THIMWOOD A/1 Nordic easy to build with
slung landing by Dick Mathis FM 4-68 \$1.25
CF-120 AMERICAN CROW A 2 Nordic 77" wing Different
approach to competition model Mathis FM 5-68 \$2.00
CF-127 NORDIC EXTRA Large 113" span R/C model with
fiberglass boom By Gyl Lano FM 7-68 \$3.00
CF-129 MOLLYMAW Superstreamlined 108" R/C thermal
soarer Carl Lorber FM 10-68 \$3.00
CF-142 PTERODACTYL Hand launch lightweight glider 20"
span By Tom Prenton FM 11-68 \$1.25
CF-148 TRIPLE R glider slope thermal power 105"
span By Marly Meyer FM 1-69 \$3.50
CF-152 TUMBLWEED 102" Nordic 74" two piece wing
for windy weather By Dick Mathis FM 2-69 \$2.50
CF-166 GAGGLER R/C soarer 117" span Pod and boom
design By Carl Lorber FM 11-69 \$3.00
CF-169 HERRICK 149 R/C glider with fiberglass fuselage
By Harley Michaels FM 1-69 \$3.50

R/C BOATS

CF-1 GLEN L SPORT FISHERMAN 39" R/C boat for electric
power By Jim Dunlop FM 7-74 \$3.50
CF-2 EZ Vee 32" wood deep vee for 29 to 40 engines
By Jerry Dunlop FM 9-74 \$2.50
CF-3 FOAMY 19 powered balsa and foam skt boat William
C Young FM 11-74 \$2.50
CF-4 POLYWOOD extended bow 19 powered R/C run
about Jerry Dunlop FM -75 \$2.00
CF-5 FM AIRBOAT 26 1/2" long water-rudder R/C airboat
for 15 engine Jerry Dunlop FM 4-75 \$2.50
CF-6 QUARTER CRACKERBOX 24" wood mono for 15 en-
gine Jerry Dunlop FM 4-75 \$2.00
CF-7 FLYING MACHINIST CRUISER 36" wood deep vee R/C
racer for OPS 40 engine Jerry Dunlop FM 2-76 \$2.50
CF-8 GREY GHOST 45" long wood competition deep vee
for 60 engines Robert Stait FM 11-76 \$3.50
CF-9 GREY GHOST 40 A 38" deep vee for 40 engines
Bob and Wally Stait FM 2-77 \$2.50
CF-10 MISURI A 26" long electric scale German one man
tugboat Gerald Jung FM 3-77 \$3.50

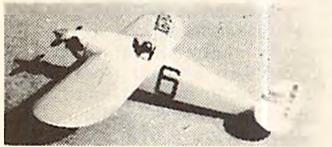
ORDERING INSTRUCTIONS: Only C listed
plans are available including those not listed
here. For building instructions refer to issue of
FLYING MODELER which article originally ap-
peared. Issue reference is given with most list-
ings. See back issue ad for complete list of back
issues currently available. For issues not avail-
able order from dealers specializing in back
dated magazines.

RADIO CONTROL

CF-158 BOONDOCK BIRD R/C trainer with 52" span for
15-19 and Hallco gear McGovern FM 4-68 \$3.00
CF-2 RAVEN 54" RC ship with lit fuselage holds PREY
glider retractable in light Single channel RC 09-19 By
Don McGovern FM 4-65 \$3.00
CF-4 FAIRFIELD Low wing R/C design 67" span 45
R/C P/O Sheets FM 2-62 \$3.00
CF-5 CITATION Multi R/C by John Roth 63" span 45
45 High wing last 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 Trige
model for sport FM 10-62 \$3.50
CF-12 GENIE Single R/C tail fuselage with 59" span Don
McGovern FM 2-64 \$5.00
CF-21 SKYLINE Class III R/C 45 shoulder wing design
By Marly Meyer FM 9-65 \$5.00
CF-22 TEMPO Class III multi annex 68" wing By Phil
Dostilio FM 10-65 \$3.50
CF-32 MARK 2 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
helios 42" wing 049 By Bert Petersen FM 4-66 \$2.50
CF-36 LUCKY 2 Class 2 R/C 60" 45 By Gene Rogard
FM 7-66 \$3.50
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
class III foam By Dallas Moran FM 10-65 \$5.00
CF-54 KOBRA II Class II RC H-bus with 60" wing 29-
35 competition model Gene Rogers FM 10-66 \$3.50
CF-72 DEFENDER Class II parasol wing 65" Removable
tray for R/C gear 45 Gene Rogers FM 4-67 \$3.00
CF-77 PIRATE III Twin tail mid-wing 60" wing 45 mil
By Nick Zirol FM 5-67 \$3.00
CF-100 SKIPPER 31" span sport flyer for single channel
1/2A and small R/C By Vince Michica 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
power By Gene Rogers FM 2-68 \$3.00
CF-116 DEVIATOR 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 skis Wally Zuber FM 4-68 \$3.00
CF-134 PROFILE MUSTANG R/C equipment is buried in
RC wing 45 56" wing By Sterling Model FM
10-68 \$3.00
CF-137 TIGER TWIN 62" span trige geared design for
two 23s R/C By Gene Rogers FM 10-68 \$3.00
CF-138 JUNKER BLUNKER Put a 45 to 60 in this Zober
ship By Gene Rogers World War I FM 10-68 \$3.00
CF-151 URCHIN Small R/C sport tail dragger for 23 and
mini gear By Gene Rogers FM 2-69 \$3.00
CF-156 VIKING ACROBAT 40" span biplane with inverted
wing R/C design by Gene Rogers FM 4-69 \$4.00
CF-161 SNIPER R/C sport flyer 68" span with 56 engine
By Wally Zuber FM 5-69 \$3.00
CF-165 BOOMERANG Big acrobatic Bipe 58" span
60-61 R/C By Wally Zuber FM 3-67 \$4.00
CF-175 VERT-A-GO Rocket assist R/C V10 with 38" span
uses Enya 45 engine Buck Zundel FM 2-69 \$3.00
CF-180 ACCELERATOR R/C sport decelerator 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 & eleva-
tor foam 63" span wing 45 Jack Sheeks FM 3-70 \$3.00
CF-206 RIDER 56" span for 40 and larger MRC Dig-
ital By Jack Sheeks FM 2-71 \$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 sheets Dave Gierke FM 5-71 \$9.00
CF-229 RAMPANT Toledo R/C Pattern Class Winner 60
inch wing retract in tandem 62" Jerry Warfield FM
7-71 \$7.00
CF-236 BANSHÉE R/C design for IRLA AFAI patterns
With Weira 61 and Pro Line gear By Jim Martin
FM 9-71 \$3.50
CF-243 SHOSTRING 57" semi-scale for Fox 35 mil By
Paul Simons FM 9-71 \$3.50

SAILPLANES

CF-1 SPOTTER A/2 Nordic with 79" two piece wing By
Joe Bilger FM 4-65 \$3.00
CF-14 SEAGULL Giant 84" wingspread soarer R/C with
supplementary 09-15 power Don McGovern FM 8-62
\$6.00
CF-16 THERMAL QUONER Radio control soarer uses Ep-
pler 385 airfoil 144" span with light wing loading By Carl
Lorber FM 11-70 \$3.00
CF-20 LIT R/C 74" glider rudder only with T tail
By Bob Hahn FM 6-65 \$4.00
CF-34 SCHWABER 126 R/C 1/6 scale glider with 67
inch canopy By Dan Lutz FM 4-66 \$2.00
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 com-
petition glider By Joe Bilger FM 7-66 \$2.50
CF-46 MINSBY 149 R/C 119" span high aspect ratio
R/C slope or thermal lift Achey FM 8-66 \$4.00
CF-65 FOAM'S HAIR WING R/C modern foam wing soarer
By Rollin McPherson 72" span \$3.00
CF-69 BOMB BOMBER FAI R/C glider one time world re-
cord altitude holder Maynard Hill 136" FM 2-67 \$4.00
CF-70 THUNDERHEAD 54" span foalme trainer By Don
McGovern \$3.00
CF-88 SOAR SAM A/1 Nordic for NATS etc 48" span
By Bill Dunwoody FM 7-67 \$2.00
CF-93 1931 NORTHROP PRIMARY TRAINER 72" span R/C
glider 1/4 scale By Marly Meyer FM 1-69 \$3.50
CF-99 PERIGRENE 89" span A/2 Nordic with fiberglass
fishing rod fuselage 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 HERRICK 149 R/C Nordic A/2 Nordic with 47 1/2
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-120 THIMWOOD A/1 Nordic easy to build with
slung landing by Dick Mathis FM 4-68 \$1.25
CF-120 AMERICAN CROW A 2 Nordic 77" wing Different
approach to competition model Mathis FM 5-68 \$2.00
CF-127 NORDIC EXTRA Large 113" span R/C model with
fiberglass boom By Gyl Lano FM 7-68 \$3.00
CF-129 MOLLYMAW Superstreamlined 108" R/C thermal
soarer Carl Lorber FM 10-68 \$3.00
CF-142 PTERODACTYL Hand launch lightweight glider 20"
span By Tom Prenton FM 11-68 \$1.25
CF-148 TRIPLE R glider slope thermal power 105"
span By Marly Meyer FM 1-69 \$3.50
CF-152 TUMBLWEED 102" Nordic 74" two piece wing
for windy weather By Dick Mathis FM 2-69 \$2.50
CF-166 GAGGLER R/C soarer 117" span Pod and boom
design By Carl Lorber FM 11-69 \$3.00
CF-169 HERRICK 149 R/C glider with fiberglass fuselage
By Harley Michaels FM 1-69 \$3.50



CF-126 HEALTH BABY BULLET 1928 racer by founder of
Health Co 56" span R/C for 45 to 60 Nick Zirol FM
7-68 \$3.00
CF-143 VIGILANTE Semi-scale R/C similar to Navy A13
51" span with 45 to 60 pusher Nick Zirol 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 Zirol FM 3-69 \$3.50
CF-159 JUNKERS CL-56 span World War I model
Enya 45 engine By Jim Burgette FM 5-69 \$3.50
CF-163 FW-190-A3 Near scale R/C retractable gear 54
span 45-56 engine Nick Zirol FM 6-69 \$3.50
CF-170 MARTIN MARAUDER B-26 R/C twin 45 scale 72
wing By Joe Amico FM 8-69 \$5.00
CF-173 DEMOSILLE Dumont's pioneer airplane 9-1
scale Zundel & Signorini RC FM 1-70 \$7.00
CF-174 BLACKBURN ALL-STEEL 1915 near scale R/C for
29 mil By Vern Zundel FM 9-69 \$5.00
CF-183 GRUMMAN FB BEARCAT 52" span R/C 40 52
Semi-scale by Nick Zirol FM 2-70 \$3.50
CF-184 INSTANT ATTC Twin Super Tigre 29s power VX
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 Zirol 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"
RAC scale By Vern Zundel FM 10-70 \$5.00
CF-223 PFALZ D-11a R/C 2 1/2 scale World War I biplane
60 mil By Alan Spevack FM 6-71 3 sheets \$10.00
CF-227 A.V. ROE BIPLANE 1911 standard 7" 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
with 43" span Don Foster FM 11-71 \$2.00
CF-253 NESMITH COUGAR Eeveball scale R/C 54" span
40 60 Simple Stan Hines FM 2-72 \$5.00
CF-273 GRUMMAN F4F WILDCAT RC semi-scale 45
span 50 Wankel 30 Nick Zirol FM 9-72 \$3.50
CF-286 B-17E FLYING Fortress Four Webra 20" R/C
1st in 72 NATS flight achievement

NEW PLANS

- CF-352 FIELD KIT.** 2 inter-related field boxes to fit compact cars. Bob Aberle. FM 11-74. \$5.00
- CF-467 WING INCIDENT INDICATOR.** An easy to build tool for better flight results. Jerry Smith. FM 1-78 \$2.50
- ### OLD TIMER
- 445 HALF-SIZED SCRAM.** Old Time replica. July 1938 Flying Aces from original 1938 design by Kay Hel. Free flight for 020 engines with a 40-inch wingspan. D.B. Mathews. FM 7-77. \$2.50
- CF-460 SCRAPPY.** A reprint of the original 1939 Flying Aces plan suitable for R/C assist. Old Timer event. \$5.00 1-78.
- CF-463 RAMBLER.** A reprint of the original 1939 Flying Aces plan suitable for Antique category OT competition. FM 2-78. \$5.00
- CF-474 RED RIFLER.** A reprint of the original 1940 Flying Aces plan suitable for Old-Timer competition. FM 5-78. \$5.00
- CF-466 DRAFTEE.** A reprint of the original 1941 Flying Aces plan suitable for Old-Timer competition. FM 3-78. \$5.00

CONTROL LINE SCALE

- CF-10 FOKKER D-VIII.** 33" span WW1 fighter biplane. CL 049-09 Paul DelGallo. Jack Sheeks FM 6-64. \$5.00
- CF-23 SPIRIT OF ST. LOUIS.** 46" scale UC, Lindbergh plane. By Paul Palanek. FM 12-66. \$2.00
- CF-33 SEA VIXION.** Royal Navy jet lighter. 35 5/8" wing. CL scale. With prop. By Jack Sheeks. FM 4-66. \$2.00
- CF-40 EXTENDED GEEBEE.** CL scale. Semi-scale lengthened for better flight. 35" span. By B. Miller. FM 6-66. \$2.00
- CF-71 LOCKHEED HUDSON.** 41" span. Twin 19 powered. Scale CL World War 2 bomber. Paul Palanek. FM 4-62. \$3.00
- CF-84 CURTIS HAWK 75.** CL scale 36" 35 French radial engine. P-40 Palanek. FM 6-62. \$2.00
- CF-87 RYAN SC.** Semi-scale CL 51" wing. 35 ml. By Jack Sheeks. FM 7-67. \$2.00
- CF-106 FOCKE-WULF FW-190.** 50" span. CL profile WW2 fighter. 35-45 ml. By Jack Sheeks. FM 1-68. \$2.00
- CF-130 BELL P-39 AIRCORA.** 56" CL. Stunt. By W. Summers. For 35 ml. FM 8-68. \$3.00
- CF-167 MESSERSCHMIDT ME-109.** Near scale 48" span. Combat CL design for 35 ml. Vince Micchia. FM 8-69. \$3.00
- CF-185 MESSERSCHMIDT ME-109.** Semi-scale CL. 52" span. For 35 engines. By Jack Sheeks. FM 4-70. \$3.00
- CF-186 RYAN PT-20.** CL stunt with 55" wing. 35 engine. Famed 2-place trainer. By A. DiMezza. FM 3-70. \$3.00
- CF-195 MUSTANG P-51.** Control line stunt for 35. Semi-scale. By Joe Berry. FM 8-70. \$2.00
- CF-197 F-860 SABRE JET.** CL stunt 54" span. With 35 ml. By Bob Lampron. FM 6-70. \$3.50
- CF-210 MESSERSCHMIDT ME-262.** Semi-scale CL 55" span. Single inverted & throttled 35. By Vornoti. FM 67. \$2.00
- CF-212 STUKA JU-87.** Famous German WW-2 dive bomber. C/L for 40 ml. By Jack Sheeks. FM-2. \$3.50 7-70.



- CF-228 CHANCE VOUGHT F4U Corsair.** 62" control line scale. 59-60 engines. 1-1/2" scale. By Ira Kulp. FM 7-71. \$5.00
- CF-241 SKY FLY.** 2" scale replica of Anton Cvetkovich's popular homebuilt for CL. Takes 40 ml. Roberts light control system. By Bob Adair. FM 10-71. \$3.50
- CF-248 F-14 TOMCAT.** CL stunt. Navy fighter. 56" span. 35 ml. By MacLusky. FM 1-72. \$3.50
- CF-297 F-105 THUNDERCHIEF.** 57" span. Stunt control line semi-scale for OS Max. 40 ml. engine. Bob Hunt. FM 5-73. \$3.50
- CF-354 BOEING F4B-3.** Profile C/L biplane. 34" span. For 29 to 36 engines. Joe DeMarco. FM 3-74. \$2.50
- CF-395 TYPHOON.** Semi-scale C/L Stunter. 56" span. ST 46 engine. Steve Ashby. FM 1-76. \$3.50
- CF-414 AT-9 JEEP.** Semi-profile C/L for twin 30's. 55 1/2" span. Jack Sheeks. FM 8-76. \$2.50
- CF-428 GRUMMAN S-2C TRACKER.** 63 1/2" span. Control line scale for 29's or 45's. Steven A. Hill. FM 1-77. \$3.50
- CF-433 HANRIOT-BICHE H-110 PURSUIT.** Control line sport scale for 35 engines. Wingspan is 48". Dick Sarpolus. FM 3-77. \$3.50

CONTROL LINE

- CF-3 COMBAT P-38.** Profile fuselage w/control craft. Twin tail. 29 3/8 engines. Jim DeMarco. FM 4-65. \$2.00
- CF-18 JAGUAR.** Control line sport for 29 to 40. Fun ship. By Fast Richard. FM 12-70. \$3.50
- CF-24 SHEIK.** Control line stunt, inverted pull wing. Inwin rudders. 35 1/2". By Jack Sheeks. FM 6-65. \$2.00
- CF-28 WHIRLWIND J.** Twin engine profile scale CL. For 20 to 15 to 19. B.A. Swanson. FM 6-65. \$2.00
- CF-29 RWETS.** Sport profile CL. Goodyear for 15. 26" span. By Vince Micchia. FM 1-71. \$2.00
- CF-38 STRAFER.** Midwing sport, twin rudder. 40 1/4" CL. By Don McGovern. FM 2-66. \$2.00
- CF-43 SUPERSONIC STUNTER.** Very clean design. Swept back 60°. wire. 35 1/4" span. Ash. FM 7-66. CL. \$2.00
- CF-49 EYFA DEMON.** 54" span. Stunt CL. Wings. Right looking. Inwin full pattern. 35 Jack Sheeks. FM 8-66. \$2.00
- CF-58 LADY FINGER.** Goodyear racer. 41 1/4" span. By Joe Berry. For OS Max. FM 11-66. \$2.00
- CF-59 KENZLER.** Stunt pattern flyer. CL uses For 35 engine with shaft extension. 50" span. By Dick Mathis. FM 11-66. \$2.00
- CF-62 TALON.** CL stunt with inverted 35. 56" span. By J. Kostecky. FM 12-66. \$2.00
- CF-67 SWINGER.** Swept wing CL stunt 51" span. 35 ml. FM 1-67. By Jack Sheeks. \$2.00
- CF-74 MITSUBISHI ZERO.** 40" span. Profile scale CL. For 19-40. Combat sport. Nick Zito. FM 4-67. \$2.00
- CF-78 EXCALIBUR.** CL stunt. 51" span. Semi-profile. By McCoy. 40 or similar. FM 5-67. Mathis. \$2.00
- CF-90 STARLIGHT.** CL stunt. 56" wing. For hot 35. By Charles Mackey. FM 8-67. \$2.00
- CF-95 PIPER CHEROKEE 140.** Semi-scale profile. Easy. By Dick Mathis. FM 9-67. \$2.00
- CF-98 MAG JET.** 44" profile stunter for 29-35. Last building. By Vince Micchia. FM 10-67. \$2.00
- CF-103 FROTH.** Twin boom sport for 049. 051 ml. 30 span. By Bob Adair. FM 11-67. \$2.00
- CF-111 NOVI 51.** 51" span. Stunt CL. 1st at 67. NATS. By Dave Giehl. FM 2-68. \$3.00
- CF-115 GRUMMAN TIGERCAT F7F-1.** CL profile with twin 15's. By Bob Adair. FM 3-68. \$2.50

- CF-494 SPIRIT OF ST. LOUIS.** Stand-off Scale R/C ship with a 93" wingspan for 40 to 71 engines. Scale 2"-1". Don McGovern, Tony Lombardo. FM 1-75. \$7.00
- CF-495 FLYING ACES STICK GAS MODEL.** A redesigned engine from the original FLYING ACES design by Bill Effinger and Tracy Byrdides with a 60" span for 21 engines. Hank Stumpf. FM 1-79. \$3.50
- CB-11 AQUIDUCT.** 40 experimental jet boat using Midwest R40 ducted fan for power and a K8B 6.5 engine. Length 48". Rob Aberle. FM 1-79. \$3.50
- CF-471 THE SILVER R/C.** pod and boom soaring glider with a 110" span for slope or thermal flying. Dick Sarpolus. FM 5-78. \$3.60
- CF-472 HOLY BOMBER.** FAI 15 competition. FIF 50" wingspan for 15 engines. Joe Slovacek. FM 5-78. \$3.50
- CF-473 P-61 BLACK WIDOW.** Twin Control line stand-off scale for 049 engine. 34" span. Michael Beaulieu. FM 5-78. \$3.00
- CF-468 RYSON 67-100 CLOUDSTER.** Stand-Off Scale R/C motor sailer for 09-10 engines with a 73 1/2" span. Howie Applegate. FM 4-78. \$3.00
- CF-469 CARE.** Stunt control line ship with a 51" span for 35 engines. Jack Sheeks. FM 7-78. \$3.00
- CF-470 EVIL WAYS.** Class A-B contest Free Flight ship for 15 to 23 engines with a 60" span. Mike Hallum/Grady Turner. \$3.50

- CF-119 BOOMER.** Twin boom stunt, profile. For 35 ml. 40" span. By Dick Mathis. FM 6-68. \$2.00
- CF-121 FREEDOM 45.** CL stunt with 45" span. Foam cored wing. 45 ml. sheet covered. Jack Sheeks. FM 5-68. \$2.50
- CF-129 NOVETTE.** Swept 48" wing. Sleek stunt CL design. profile. OS Max. 35. Norm Dion. FM 7-68. \$3.00
- CF-134 SPITFIRE STUNTER.** Semi-scale CL 49 1/2" span. 40 engines. By Jack Sheeks. FM 11-68. \$2.00
- CF-140 COYOTE.** Long lean CL stunter for 35-40 54" span. By Dick Mathis. FM 10-68. \$3.00
- CF-141 FURY.** Stunt C/L. Fox 35 engine, trike gear, full span flap. 54" span. By Don Bambrick. FM 2-67. \$3.00
- CF-142 BOMBER.** Combat. 42" span. High speed. For 35. Terry Prather. FM 11-68. \$1.50
- CF-147 FORMULA S.** 55" span. CL stunt. 2nd at Olathe. NATS. By J. Kostecky. FM 12-68. \$3.00
- CF-149 TORINO.** 53" span. CL stunt with 35 ml. Modern. By Jack Sheeks. FM 11-69. \$2.50
- CF-154 DOTTSMAN.** 54" span. CL stunt swept wing. With full flaps for 35 Jack Sheeks. FM 2-69. \$2.00
- CF-160 KING COBRA.** CL 35. Slow combat with 48" span. Vince Micchia. Manueverable. FM 5-69. \$2.00
- CF-162 PEGASUS.** CL stunt. 630 sq in. 57" span. McCoy. 40 engine. By Bob Howard. FM 11-69. \$3.50
- CF-164 KNIGHT.** I tailed. CL stunt. 52" span. 35 ml. By Jack Sheeks. FM 6-69. \$2.50
- CF-172 HILLO.** 51" CL stunt trainer. Fast building for beginners. Uses 35 ml. By Paul Palanek. FM 9-69. \$2.00
- CF-177 KAWASACKI.** CL. Control line combat profile. For 35. By Vince Micchia. FM 11-69. \$2.50
- CF-181 TEAR-A-LONG.** Combat CL. small and compact. For Cox 15. By Fast Richard. FM 12-69. \$2.00
- CF-192 NOVI IV.** 55" span. Stunt control stunter for 35 ml. FM 5-70. By Dave Giehl. \$2.00
- CF-193 GLODY.** Stunt control line 53" span. 35-40. By Jack Sheeks. FM 2-71. \$2.00
- CF-213 MYSTERIE II.** C/L stunt with 55" span. 29-40 ml. Sensitive. By Jim Van Loo. FM 10-70. \$3.50
- CF-219 MANDLER.** 29-40 control line all wood sport profile. By Fast Richard. FM 5-71. \$2.50
- CF-225 VULCAN.** CL stunt. Optional foam or built-up wing. 56" span. For 35. By Bob Lampron. FM 6-71. \$3.50
- CF-231 MAGISTER.** CL profile trainer of French training ship. Fox 35 powered. FM 8-71. By Jack Sheeks. \$2.00

- CF-246 STUNT MACHINE.** 2nd Place 71 NATS in a sleek 35 pater. CL. Gene Schaller. FM 12-71. \$3.50
- CF-257 DOUGLAS SKYRAIDER.** Semi-scale stunt CL. 40" span. By Don Lyndon. FM 3-72. \$3.50
- CF-258 IRON BUTTERFLY.** FAI combat C/L with 33" span. By Fast Richard. FM 3-72. \$2.00
- CF-259 UNITED.** Stunt CL for 35 53" span. Bob Lampron. FM 4-72. \$3.50
- CF-167 BE WITCHED.** Twin boom stunt control line. 51" span. For McCoy. 40 Jack Sheeks. FM 7-72. \$2.50
- CF-262 TIGER MIRAGE.** FAI CL team racer for 15 diesel 33" span. Dave Kelly. FM 5-72. \$3.00
- CF-265 WARHAWK STUNT.** CL. Stunt ship for 35-40 ml. With 35 ml. By Dick Mathis. FM 6-72. \$2.50
- CF-277 FLY BABY.** Semi-scale control line stunt ship. 57" span. 40 McCoy powered. Jack Sheeks. FM 10-72. \$2.50
- CF-283 PINTO.** A Stunt CL. For Cox Tee Dee. 049 with 34". span. Dick Mathis. FM 12-72. \$2.50
- CF-291 MONGOOSE.** Slow combat CL 40" span. 35 ml. By Dick Mathis. FM 3-73. \$2.50
- CF-295 CITABRIA.** Profile stunter for 29 to 40 ml. Dick Mathis. FM 4-73. \$2.50
- CF-301 PLUM CRACK CASUITS.** Goodyear team Racer. 26" wingspan. Powered by K&B 15 engine. By Matt Smith. FM 4-73. \$2.00
- CF-302 VOLUNTEER.** 51" stunt. Control line. McCoy. Jim Lynch. FM 7-73. \$3.50
- CF-307 HURRICANE.** Stunt control line with 19" wing and Fox 35 engine. Jack Sheeks. FM 8-73. \$2.50
- CF-309 EXCALIBUR II.** CL profile stunt ship for 40 ml. 51 1/2" span. Dick Mathis. FM 9-73. \$1.50
- CF-312 U-2 STUNTER.** CL profile stunt ship for 049. 051. 50" span. Jim Lynch. FM 11-73. \$3.50
- CF-315 SPIDER.** Slow combat control line wingspan uses Fox 36. Lou Woodard and Mike Tallman. FM 11-73. \$2.50
- CF-316 MISS DARA.** CL stunt with 49" span. For Fox 36 engine. Dennis Duval. FM 12-73. \$2.50
- CF-322 GENESIS.** Stunt Control line winner with 35" span. For 35 engines. By Bob Hunt. FM 2-74. \$3.50
- CF-327 P-26 STUNTER.** Control line by Jack Sheeks. For 35 to 60 61" wingspan. FM 1-74. \$2.50
- CF-329 TALON STUNTER.** C/L Stunt 1-18 with 40" span. OS MAX 35 Stunt engine. Dave Kelly. FM 4-74. \$3.50
- CF-332 HEINKEL HE-219.** Profile twin control line twin 15 engines. 38" span. By DeMarco. FM 5-74. \$2.50
- CF-335 EROUPE.** Profile C/L for 19 to 40 engines. 53" span. Dick Mathis. FM 4-74. \$2.50
- CF-338 SUNSHINE.** C/L Stunter for 35 engines. Andy Lee. FM 7-74. \$2.50
- CF-342 CLIPPER.** C/L Slow Combat, 5 3/8" span. For 35 engine. Win Wiley. FM 8-74. \$2.50
- CF-344 BISHOP.** Stunt C/L for 35 to 46 engines. 56" span. Jack Sheeks. FM 9-74. \$2.50
- CF-347 MALCOLM.** 202 C/L Stunter. 51 4/8" span. Dennis Duval. FM 10-74. \$2.50
- CF-355 MELIAPHOR I.** Stunt C/L for 35 engine with 17" span. Bill Bradford. FM 1-75. \$2.50
- CF-358 P-51B STUNTER.** I missing for stunting with 60" span and 60 engine. Jim Vornoti. FM 1-75. \$3.50
- CF-363 SCORPIO.** CL Stunter. 60" span. 46 1/2 engine. Bill Simmons. FM 3-75. \$3.50
- CF-364 PANU.** Stunt control line for Super Tige. 46 ml. engine with 51" span. By Jack Sheeks. FM 4-75. \$2.50
- CF-368 "SKYFIRE."** 1/2 A C/L stunt profile for Cox loom. 28" span. Larry Renner. FM 5-75. \$2.00
- CF-371 ASTARIE.** Precision C/L Stunter with 63" span and 47 engine. John Hagen. FM 6-75. \$3.50
- CF-376 MAJORAUD.** Fast Combat C/L for 35 and 36 engines. 47" span. Bob Howard. FM 7-75. \$2.50
- CF-388 SUNDANCE.** C/L Stunter with 55" span. 40 engines. Chris Lella. FM 11-75. \$3.50
- CF-392 MISS JILL.** Profile C/L Stunter with 52" span. For Fox 35 engine. Jack Sheeks. FM 12-75. \$2.50

- CF-398 BEARCAT & ZERO.** Two Profile C/L with 29" span for 09-15 power. Joe DeMarco. FM 3-76. \$2.50
- CF-404 SQUIRREL.** C/L Stunter. 53" span. 35-40 engine. Jack Sheeks. FM 4-76. \$2.50
- CF-409 "METAPHOR II."** C/L stunter with 52" span and 35 engine. Bill Bradford. FM 6-76. \$2.50
- CF-411 TRAGER.** C/L Navy Profile Carrier. 32" span. 15 engine. Russ Brown. FM 7-76. \$2.50
- CF-421 THE TORCH 54."** span C/L stunter for 35 engine. Dick Sarpolus. FM 10-76. \$3.50
- CF-423 DAZLER.** 40" C/L Stunter with 56" span. For OS Max. 40 engines. Dick Mathis. FM 11-76. \$3.50
- CF-444 THE WILD GOOSE.** Canard control line stunter with 48" wingspan for 35 engines. Dick Sarpolus. FM 7-77. \$3.50
- CF-447 GENESIS 46.** MK III Control line stunter. 60" span for 46 engines. Winner of 1976 Hais. R.W. Hunt. FM 8-77. \$3.50

FREE FLIGHT GAS

- CF-15 RAVEN.** 1/2A competition H 049-051 48 parasol wing. By Fast Richard. FM 11-70. \$2.50
- CF-19 TIME MACHINE.** Free flight 1/2A 049 to 051 with 15" span. By Dick Mathis. FM 12-70. \$2.50
- CF-25 WARRIOR 74."** span sport design for 15 engine. \$2.50
- CF-26 GNAT.** Free flight \$1.00
- CF-31 SKYSTREAK.** Free flight for 29-35 but adapts to 23 to 40 FM 1-71. \$3.50
- CF-39 CENTURION.** FAI 65 Nats winner FF 15 Record 38.5 duration. By R. Simpson. FM 6-66. \$1.50
- CF-45 ROCK-IT-A-GO-GO.** Jetex powered contest ship by P. Crowley. FM 7-66. \$1.50
- CF-47 CARAVAN.** 24" span 1/2A free flight easy build. By Joe Bilgi. FM 8-66. \$2.50
- CF-56 DROP DUT.** X-15 style Jetex powered. By Don McGovern. FM 10-66. \$1.50
- CF-60 HATE SEEKER.** Mk III rocket FF 28" span. Jetex power. By Ken Whiting. FM 11-66. \$1.50
- CF-61 TRIGGER.** 1/2A contest FF. High thrust line for Cox. 049-051. By Dick Mathis. FM 12-66. \$2.00
- CF-80 PANDORA.** 1/2A FF with 48" span. Nats design by Fast Richard. \$2.00
- CF-82 WILD GOOSE.** FF contest 1/2A engine 36" span. Unusual/affair. By Bill Cowie. FM 6-67. \$2.00
- CF-107 TEXAS EAGLE.** 77" span FF contest. High thrust for 049. By Dick Mathis. FM 11-68. \$3.00
- CF-115 SOLITAIRE.** 1/2A contest FF. For FAI with 44" span. By George Murphy. FM 3-69. \$1.50
- CF-125 LIL SPOILER.** 1/4A FF. Contest design with 32" span. 020 engine. By Bob Adair. FM 1-50. \$1.50
- CF-128 HYBRID.** 60" span FF contest class A with 15" or class with 23. Bob Adair. FM 7-68. \$3.00
- CF-131 FIRE FLY.** Sport flyer for Jetex 50 Helical jet engine. Rocket design. Reid Simpson. FM 8-68. \$1.50
- CF-133 IALAPENA.** FF contest 48" span. High thrust for FAI 049. By Dick Mathis. FM 8-68. \$2.00
- CF-135 PANGLOSS.** Class C FF with 90" span. 40" span. By William Harding. FM 9-68. \$3.00
- CF-145 HYSTERIA.** 60 63" free flight with 15 engine. By Dick Mathis. FM 1-69. \$3.00
- CF-157 C-RECK MYTH.** FAI FF design with 62" span. 15 engine. By Richard Hill. FM 11-68. \$2.00
- CF-178 ONE GRAND.** FF class C. 80 1/2" span. 1000 sq. in. By Dick Mathis. FM 2-67. \$3.50
- CF-191 LASER CHASER.** FF 1/2A 48" span with Warren Truss multi span wing on pylon. Kit Bays. FM 4-70. \$2.00
- CF-196 MIGHTY WING.** 1/2A FF payload. 34" span. For former PAAK event. Uses D2D. Dave Linstrom. FM 7-70. \$2.00
- CF-218 TORNAAD.** 48" span 1/2A free flight competition. Tee Dee. 049. Reid Simpson. FM 5-71. \$2.00
- CF-221 LIMET 1/2A POWER.** High climbing FF contest design to British formula. 049. Dave Linstrom. FM 9-70. \$2.00
- CF-222 GO-CRAB.** 48" span free flight for Cox Tee Dee. 020. FM 5-71. By Dave Linstrom. \$2.00
- CF-224 BURRITO.** FF for AB with 65" span. 23 ml. By Tom Hulshon. FM 11-71. \$3.50
- CF-242 LIPSTICK.** C. All Vias class C free flight for 40 ml. with 80" span. Inwin jax. construction. Formidable climb. Glycerin. FM 10-71. \$1.50
- CF-253 RAMBUNCTIOUS 1040.** Class C free flight. 1040 sq in. for 40. Fast Richard. FM 2-71. \$5.00
- CF-254 RAMBUNCTIOUS 480.** Class A, B free flight for 15-23 ml. 50" span. Fast Richard. FM 2-71. \$3.50
- CF-268 EXCELSIOR FAI.** 1972 FAI Power Nats 1st Place winner. Free flight. 64" span. K&B or Rossi. 15 Seelig timer. D.T. auto timer. Dave Rounsaville. FM 7-72. \$2.50
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Whaley dominated Air Race. Rich Brasher and Eddie Bridant took over in Combat. The Carpenters and Economy were synonymous. Millard Hampton and Don Hofffelder were the ones to beat in Scale. And Vic Garner, Gary Buffon and Ed Jacobs had a private war going on in Ten Mile. Joyce Margarido took Speed; Bob Anderson, Proto. Dan McClellan had a first and a second in Stunt. Dave Fitzgerald took Stunt BC Expert with Arlie Preszler second and Hofffelder, third. Novice Dave Price did 1:42.2 with a ten-inch glider, and Beginner Brian Hattrup did 2:36.9, both better times than were logged in Advanced/Expert.

IVRC Beef-Fly Scores Big

"A success in every aspect." That's what prexy Chuck Eberhard of the Illinois Valley bunch termed the recent Fun-Fly out around Ottawa. And, if you're a regular reader of WMB, you'll remember that we mentioned that the club was going to raffle-off a side of beef at this one. How did it go? Well, Chuck says: "Financially, this Fun-Fly was the most successful ever. And the tickets for the side of beef were ten times easier to sell than those of previous meets for R/C aircraft. After all, every red-blooded American eats beef." Besides the finances, however, there were other benefits:

Don Zukowski of station WLPO taped a half-hour interview with a quartet of club members which was aired on the Breakfast Club Show on Sept. 19. The event drew a capacity crowd which saw trainers, sport planes, stunters, gliders, pattern planes, quarter-scale, and helicopters in action. And there was some pretty satisfying newspaper coverage. Special events included a clown act, aerobatic helicopter flying, a pattern routine, egg drop, and formation flying. Howie Halm, Daisy Bond and Don Wenzel handled the PA. Dick Wheeling came up from Elgin and put on the helicopter demo; Marv and Dave Doucey staged the Pattern show; and, Clarence Wheeler did a special routine with his Nosen Cub and Citabria. The crowd certainly had an opportunity to see R/C flying at its best. It all added up to good public relations.

We don't know who won the side of beef; but we'll bet the IVRC won a good bit of public approval.

Meek Takes Expert At SC Pattern Champs

Jim Swainson and the Spartanburg Sky Knights once again hosted a winner. This year's SC Pattern Champs were generally acknowledged to be one of the year's best meets. In terms of organization and management, it prompted comments like "better-run than the Nats." Well, Jim and the boys run a tight ship.

The meet drew 38 entrants, 36 in Pattern and two in Scale. Four judges of whom Jim was one ran the whole shebang, and flying extended over four rounds. Sherman Meek took top honors in Expert and won his class in the State Champs. Other winners included: Novice—Mike Powers, Charlene Fields, John Fuque; Advanced—Glenn Fields, Bob Lesmireses, Johnny Powers; Master—Larry Nash, Bill Hardin, Al Tyler. Charlene Fields, Larry Nash and Glenn Fields were named S.C. Champions. Tom Phelps took Stand-Off Scale, and the top Junior was Stan Stockman. George Hixon was runner-up in Scale. The Fields, Larry and Charlene, are a husband-wife team. She

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A helpful hint, from your FM Staff.

is AMA Contest Coordinator, and he is President of the South Carolina Radio Aircraft Modelers, Inc. (SCRAM)

Northeastern Racing Winds Up

Racing in the Northeast will wind-up with the Westover AFB meet in Chicopee, Mass. PRO Racing News has released standings in Q-500 and Goodyear as the racers come down to the wire. The Top Ten in Q-500 include: Guy Beaudoin, Paul Senyk, Jeff Shumate, Larry Weddle, Bob Wallace, Al Sager, Pete Reed, Arnie Wile, Rob Wallace and Nick Nesol. The Top Five in Goodyear are: Pete Reed, Glenn Sicotte, Arnie Wile, Bob Wallace and Tom Castellano.

At the Central Connecticut meet, Wallace, Beaudoin and Shumate finished 1-2-3 in Expert. Al Sager and Larry Weddle were next in line. Among the Standard flyers, Tom Dooly finished first, in 10th place, overall. Nick Nesol was right behind him, and 14th-place Gary Dabrowski was third. All this in Q-500.

At the Ballston Spa Formula 1 meet, it was Reed, Castellano and Ed Weitoek in that order. Flying Standard, Jeff Shumate finished fourth overall to take first in his class. Weddle in seventh place was second, and Tom Dooly in 13th place was third. In the Quickie event, it was Weddle, Senyk, Beaudoin, Shumate and Mike Helsel—in that order. Standard flyers Dabrowski, Dooly and John Eyer were 1-2-3 in 14th, 16th and 17th place, respectively. Eyer took his third in the very first race of his career. Dooly is well on his way to working his way out of the Standard Class—one more time under the 2:15 standard will do it. His time was 2:11.6.

CL World Champs Wrap-up

The '78 WC's were held at RAF Woodvale with housing provided in nearby Liverpool University. The R/C Scale WC's were held concurrently, but the C1 Scale Champs were cancelled because the Iron Curtain bloc pulled-out in protest of South African participation. The big news was the U.S. victory in Stunt with Bob Hunt's taking the World Champion title. Al Rabe was second, Les McDonald (defending champ) was fourth, and Bob Gieseke was fifth. The scores of Hunt, Rabe and Gieseke cinched Team honors for the U.S. McDonald was flying as an individual entrant.

In Speed, the U.S. placed eighth via the placings of Bob Spahr (3rd), Charles Lieber (5th), and Chuck Schuette (38th). Lenzen of Germany won; Bilat of Switzerland was second. France took Team honors.

Combat was won by Great Britain's Mike Tieman with his team mate, D. Wood, right behind in second place. Fraisse of France was third. Britain took Team honors; the U.S.A., fifth. Chuck Rudner and Gary Frost were part of a 9th-place tie (or level); and George Cleveland, a 17th.

Great Britain took Team honors in Team Racing; the U.S., sixth. U.S. placings follow: Dodge/Nelson (13th); Albritton/Joy (14th); and, Jolly/Kusik (23rd). Holland turned out the World Champions, Metkemeyer/Metkemeyer; and Denmark the runners-up, Geschwendtner/Mau. Heaton/Ross (Great Britain) were third.

From all reports, this was one of the wettest and coldest WC's ever held. And the British organizers had not only the weather to contend with. It appeared to many that the commercial aspects of the situation got a bit

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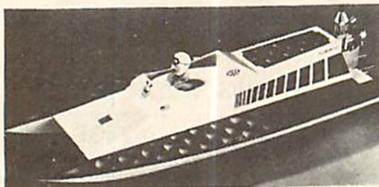
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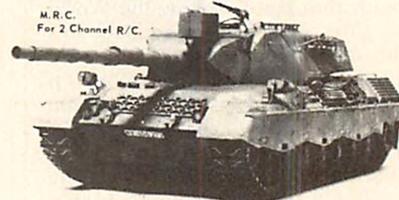


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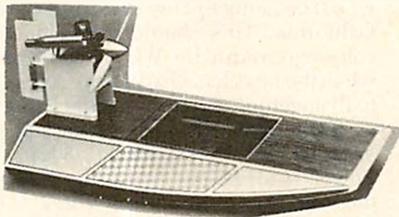
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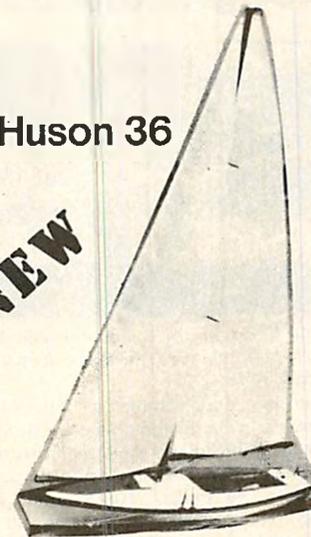
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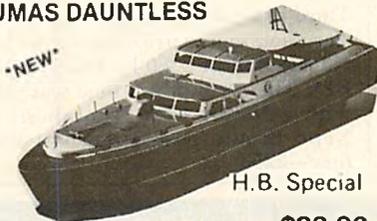


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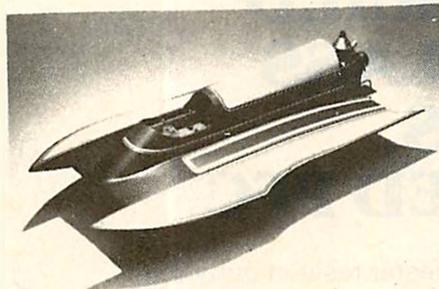
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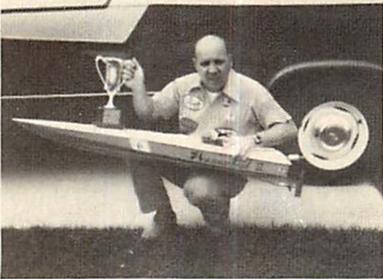


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out-of-hand as the airdrome succumbed to a fairgrounds atmosphere complete with tents, kiddie rides, car shows, exhibits, etc. Under the circumstances, the host group did a commendable job. But along with the carnival, the R/C Scale Champs, and the flying demos, there was simply too much going on at one time in a limited space to be completely controlled.

FAI Challenge Held in NW

After an Army-induced postponement, the First Annual FAI Challenge was finally held at Harts Lake Prairie, Washington. Kevin Collins CD'd the affair which followed a novel format. Three-man teams were selected by a random draw, and this resulted in a series of close races as the flying progressed through fourteen rounds. Individual and Team totals were what counted—regardless of what team members happened to be flying. The top Team flew two Nordics and a Wakefield; the second, the same; the third, ditto; but, the fourth flew two Power ships and a Wake. At the end of fourteen rounds, only 85 seconds separated the first and third-place Teams.

The winning team of Beattie, Sietins and Helmick racked-up a total of 6242 with Beattie flying F1B (Wake) and Sietins and Helmick flying F1A (Nordic). Second-placers Collins, Thornberry and Lenderman totaled 6225 (Lenderman flying F1B). Third-placers Cashman, Hutchinson and Nagasawa scored 6157 despite the best individual effort of 2380 by Marc Nagasawa in F1A. The second-best time was also made with a Nordic—Jim Thornberry's 2342. Norm Beattie posted the best Wakefield time—2253.

Weather conditions varied from dead air to somewhat breezy (15 mph) during the two-day meet. The emphasis on team competition made for a novel meet. We should see more venues to this format.

Bits 'n Pieces

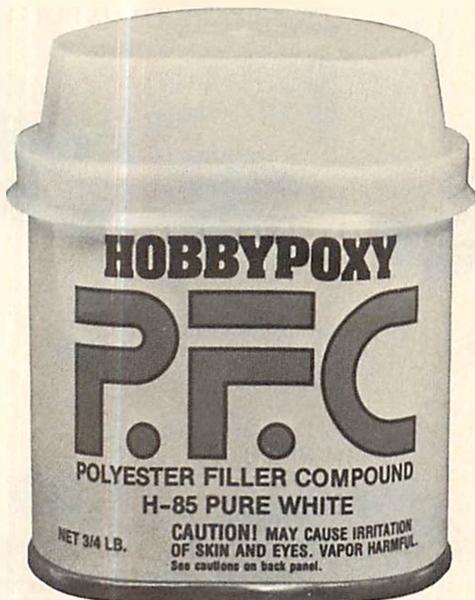
- We know that inflation is running rampant; but an item that gave us pause for reflection was Bee Williams' disclosure that the PRO group had to coughup \$75 to rent a portajohn for the one-day Westover AFB meet.

- At the Kent Field Champs in Washington, John Kamla discovered one of the hazards of lining-out after a model FF on a trail bike. He ran over his own model with his Trail 90.

- Eight of the nine FF Team members who'll be going to Yugoslavia in '79 are from California. This should make for a more cohesive group at the WC's. Can't remember when the boys have had a better opportunity to fly together. Top times at the Finals went as follows: Nordic—Bob Isaacson, 3210; Wakefield—Walt Ghio, 3420; and, Power—Carl Bogart, 3420. Those 3420's, by the way, represent perfect scores.

- The Bat Sheet reports that the Boeing Hawks and the Bats flew at the Seattle Kingdome again—this time for money. They flew at halftime during the Sea Hawks/L.A. Rams game, and management paid them for it. Guntis Sietins wowed the crowd with a full 50-meter Nordic launch, but his Seligull ended up on a speaker cable where it remained for several days.

- According to the Newsletter, the DCRC Demo Teams will have flown before 18,000 spectators and earned about \$1200 for the club by the end of the season.



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AQUIDUCT 40

A new way to run an air-boat with a K&B 6.5 driving the Midwest RK-40 Ducted Fan. Here's a test bed design to get the experimental juices flowing/**Bob Aberle**

PHOTOGRAPHY: BOB ABERLE



Patti Aberle with Aquiduct 40, her Dad's new Futaba Contest-7 transmitter, with dual rate controls.

Propeller driven air boats are certainly not new to our hobby. Many R/C airboat designs have been published and to this day several very fine kits are offered on the hobby market. In just about all cases the airboat has been relegated to the R/C sport boating enthusiast as the serious competition minded "boater" is into more involved marine propulsion systems and does not usually consider this type of powerplant.

In the January, 1978 FLYING MODELS I had the opportunity of reviewing the then new Midwest RK-40 Axi-Flo Ducted Fan unit. Although originally intended for model airplane power there is no reason why ducted fan power couldn't easily be adapted to both model boats and car use. Along these lines the concept for the Aquiduct 40 evolved. The idea was to utilize the RK-40 Axi-Flo in an experimental boat that required an absolute minimum amount of construction time and material. Although many modelers avoid "scratch" building from plans, this boat is so simple you could hardly have any problems. In case you were wondering, yes, that is an elevator you see besides the normal rudder. More on this later.

The full size plans are a must in this case. From them you can use tracing paper to make all the necessary templates. The starting point is the foam hull itself. I originally tried to obtain a standard pool type foam paddle board. One of these boards had

been used successfully in an R/C Modeler magazine article last year, employing a K&B outboard engine. Unfortunately I never did find an appropriate size board to handle the potential power of the RK-40 (which in my case is fitted with a K&B 6.5cc front rotor engine). Generally the ready made paddle boards were both too narrow and too thin. I needed a little extra thickness to house the R/C equipment. My friend Nick Zirola came to my rescue with a 3" thick piece of expanded foam measuring 48" long x 24" wide. Nick band sawed the circular bow shape and I was on my way. Since then I have located a great alternate source for the foam. My local lumber yard (and presumably others around the country) offer 1" thick expanded foam insulation board, coincidentally measuring 48" x 24". They sell this material in my area for approximately \$1.50 per sheet. You could easily cement three of these sheets together to get the necessary 3" thickness, at a cost of under \$5.00.

Shaping the foam was easy. I bought a small (hand grip type) Stanley "Surform" sanding tool. It resembles a coarse file or rasp. Within 45 minutes I had the entire hull shaped (in some fashion). I did not calculate a thing in this design, it was all a great big

guess on my part (I believe in being honest). I simply rounded the top edges of the hull with approximately a 1" radius. The bottom edge was rounded a little more (like 1 1/2" radius). The bottom of the hull tapers upward somewhat as you approach the bow. After rough shaping I sanded the foam smooth with #80, 150 and 220 garnet paper. I did not round the edges at the stern. In fact I simply cut out a transom from 1/8" plywood and epoxied it in position. This provides a brace across the entire width of the hull (at the rear).

A few manufacturers shared my enthusiasm for this experimental project and were good enough to supply me with most of the necessary material. Not to sound commercial but I will mention items throughout this text as a courtesy to these people. To start, Midwest Products (Mr. Ed Rogala and Jim Newman) supplied all the necessary plywood for the boat. Just for information, I used two 48" x 24" sheets of 1/8" ply and a single, 48" x 24" sheet of 3/16" ply. That, plus a little ply, balsa and spruce scraps is the extent of the wood material. All the cementing of the plywood parts to the foam hull was done with the new Hobbypoxy Formula-3 (thixotropic) glue. This glue is very slow

drying, but stays in place and most important, doesn't attack the foam in any way.

Next item required in the assembly sequence is the duct support bulkheads. Two identical supports must be cut out of $\frac{1}{8}$ " plywood (use the side view outline for a template). As you can see both supports actually penetrate approximately $\frac{3}{4}$ " into the top of the hull. Two slots were cut in the foam to this depth to accept these supports. Line up the supports at right angles to the hull and epoxy in position. Remember, the spacing between the two supports must be the same as the outside diameter of the duct barrel. Mounting the RK-40 is then very simple. Just four 4-40 screws (two on each side) go through the plywood supports directly into the plywood rings of the RK-40. I mounted 4-40 "T" nuts on the inside of the duct barrel. Use a Dremel tool with a grinding wheel to cut-off the screws flush with the end of the "T" nuts.

Tackle the radio compartment next. I marked out the area on the top of the foam hull. You could simply cut or hollow out the foam with a knife to form the compartment. I found it easier to wrap a piece of #14 copper wire around my Ungar 47 watt soldering iron tip. Using a steel straight edge I then easily melted away the foam to achieve the proper opening. The entire inside of the R/C compartment is lined with $\frac{1}{8}$ " plywood which is epoxied to the foam. This will not only smooth out the surface but make it easier to waterproof the radio compartment. Have the $\frac{1}{8}$ " ply come up flush with the top surface of the hull (on all four sides). Don't forget to put the $\frac{1}{8}$ " ply floor in the compartment as well. Leave the finishing of this compartment until later.

Proceed now with the aerodynamic controls. The Aquiduct 40 being experimental by nature employs some new control ideas. The rudder works primarily off the air load created by the duct itself. Along the same theme I decided to try an elevator, like on an airplane, to control the pitch attitude. Patterns for both of these control surfaces can be taken easily off the full size plans. More will be said later about these controls. Use medium to hard $\frac{1}{4}$ " balsa for the stab and elevator and follow the grain pattern shown. Because of the RK-40 fuel tank I was forced to separate the elevator into two sections which requires an extra control horn and rod. Epoxy the stab to the plywood support bulkheads. I also added some Sig Epoxolite fillets for additional strength.

The vertical fin construction is a little more complicated. For additional strength I employed some scrap pieces of $\frac{1}{4}$ " ply and a $\frac{1}{4}$ " x $\frac{1}{2}$ " spruce spar which actually projects all the way down to the bottom of the hull. It would be a good idea at this point to mount the muffler on the engine to check the necessary clearance. Since I used the K&B 6.5cc engine the natural choice was a MAC's extractor muffler and a tunable exhaust extractor (two separate items). These components were supplied to me by Wally McAllister of MAC's Mufflers, 8020 18th Ave., Sacramento, California 95826. This muffler set is attached to the K&B 6.5cc using K&B's #9024 adaptor exhaust extension and #9023 "O" ring. I did find it necessary to remove the rear cylinder head fairing which is normally attached to the inner pod of the RK-40, to clear the muffler. This causes a little loss in duct efficiency, but is within acceptable limits. With the muffler in place you can then fit the vertical fin around

it and the RK-40 integral fuel tank. The rudder is cut from $\frac{1}{4}$ " medium balsa. Use the heavy duty Du Bro or Klett hinges for all of these surfaces. Do not glue the hinges at this time.

Now we get to the actual control hook up. As you can see in the photos I cut recesses or channels in the top of the foam hull to accept the various Sullivan Gold'N Rod control tubes. One rod leads directly back to the rudder from the servo. The elevator rod has to split into a "Y" connection, one going to each of the separate elevators. The throttle takes a little care, but is still easy. I ran a control rod out to the rear of the duct. At this point it connects to a modified $\frac{1}{2}$ A bellcrank which is mounted on the inside of the plywood duct support bulkhead. At the top of the bellcrank I connected a steel wire which runs back inside the duct to the Perry carb throttle lever on the K&B 6.5cc. The bellcrank simply changes the direction of the throttle control. To remove the entire duct you simply detach the throttle wire and remove the four 4-40 screws. Out it comes for easy maintenance. I covered all the exposed control rod channels with $\frac{1}{16}$ " balsa which was epoxied in place.

Finish off the R/C compartment by adding a frame around the top of the opening using $\frac{1}{4}$ " x $\frac{1}{2}$ " spruce. Lay this spruce on the flat side and use epoxy cement (the 5 minute variety will do fine here). Add an additional frame of $\frac{1}{8}$ " x $\frac{1}{2}$ " spruce around the first frame. Stand these pieces in the vertical plane. This now leaves a recessed opening which will accept a $\frac{1}{8}$ " ply R/C compartment cover. For a final touch add $\frac{1}{2}$ " triangular balsa stock all around the frame as shown on the plans. Add the hardwood servo bearers to the rear portion of the compartment. At this point I gave the entire compartment a couple of coats of Hobbyoxy Formula 2 glue to act as a sealer against water penetration (especially from the bottom of the hull). You will notice that I located the R/C system switch in the front corner of the compartment along with the charging jack. Directly above the switch I mounted the top portion of a Hobbyoxy thinner can to the plywood R/C compartment cover. This is the portion of the can with the threads that accepts the cap. The cap itself then seals the opening. To turn the radio on or off you simply unscrew the cap and reach in with your finger. The same goes for access to the charging jack. It's simple and costs nothing. For the radio antenna I epoxied a piece of outer Gold 'N Rod into the R/C compartment cover. Pass the radio antenna up through this tube and then out to the front edge of the stabilizer. This gets a good portion of the antenna outside the R/C compartment.

One last piece of structure must be added, the keel. Cut it out of $\frac{3}{16}$ " plywood and insert it in a slot cut along the bottom of the hull on the centerline. The soldering iron with a piece of copper wire attached can melt away this slot easily. Cement the keel in place with Hobbyoxy Formula 3 so that the glue doesn't run all over the place.

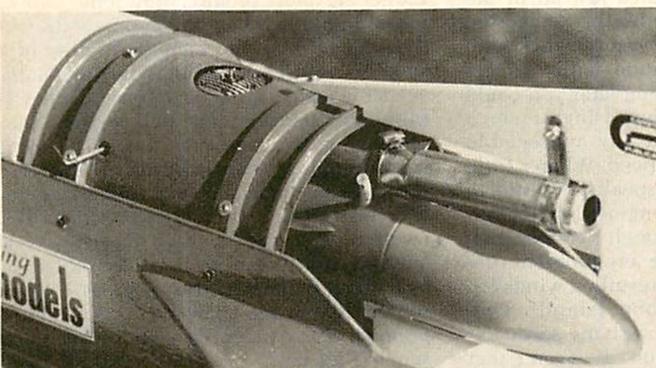
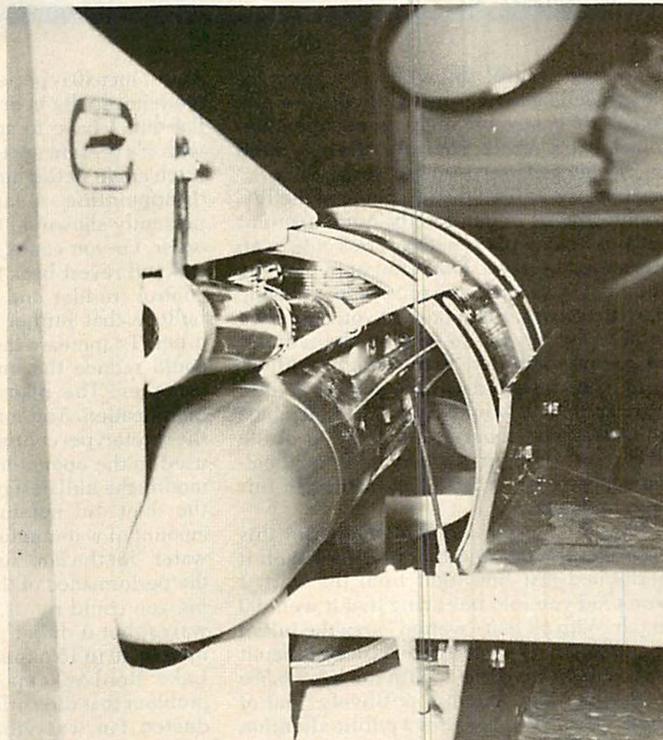
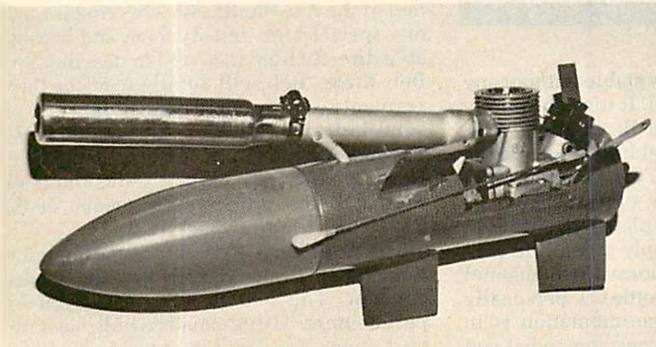
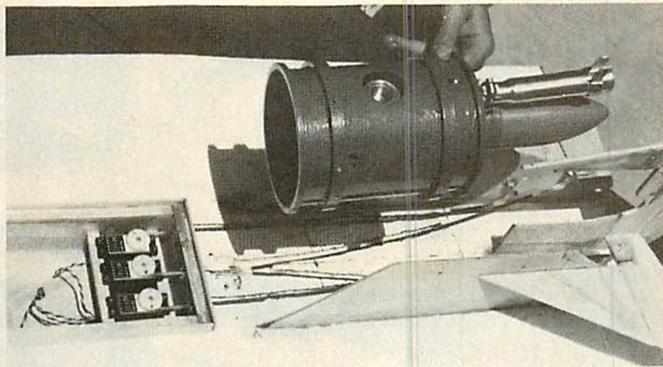
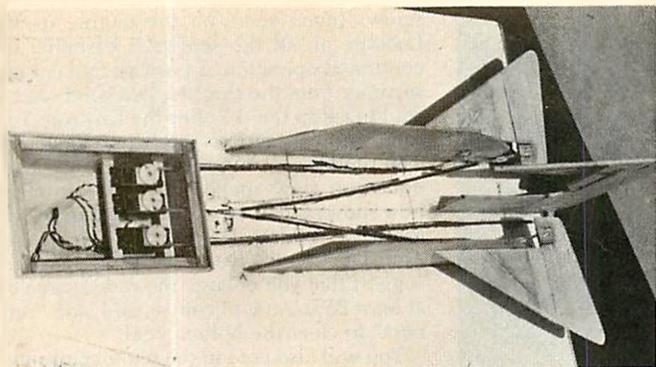
Now for the finishing. I tried to keep it as simple as possible because of the large area involved. The new Midwest Styromate did the real trick, but take heed of one caution. It does not stick to epoxy cement at all. To do the job right you have to coat all the exposed epoxy surfaces with Elmer's Carpenters Glue (the waterproof type when it dries) which sets up a barrier. I thinned the Elmer's glue about 25% with water and sim-

ply brushed it on over the epoxy areas. After this it was easy to brush on the Styromate. Before I forget, I did install the two pilots heads (Williams Bros. Military scale 2" #172) and the Sig 14" bubble canopies at this point (just before applying the Styromate). The canopies are epoxied to the foam hull. When dry I added a Sig Epoxolite fillet around the entire base of both canopies. It would be a good idea to cover both canopies at this time with masking tape to protect them during the finishing operation. Since the Epoxolite is an epoxy base, you better coat it also with the white glue mixture first.

Because of the large size I found it easy to drill a hole in each end of the hull, on the centerline. In each hole I inserted a piece of $\frac{5}{16}$ " diameter dowel (with some epoxy glue). Let about 6" of dowel stick out on each end. You can then support the entire hull by these two dowels. A bench or stool on each end works fine. The entire hull then operates like a rotisserie on a Bar-B-Que. This speeds up the painting process and lets you still work by yourself. I brushed on two thick coats of Styromate over the entire hull. It took approximately 1 $\frac{1}{2}$ jars (16 ounces per jar) to do the job. My foam was an open bead type so it couldn't be completely sealed. If I didn't care about weight I could have first brushed on a filler coat of thinned Dap spackle, before applying the Styromate. I sanded both coats of Styromate with #150 and then #220 paper. After this I applied three coats of Hobbyoxy white. The first two coats were brushed and the final coat was sprayed (thinned about 30%). This gives an acceptable finish. Stripes were masked off and hand painted with Hobbyoxy orange. Since the paint runs easily under the tape I was forced to use $\frac{1}{8}$ " wide D.J. (blue) Multi-Stripe all around the orange paint trim (which looks quite attractive).

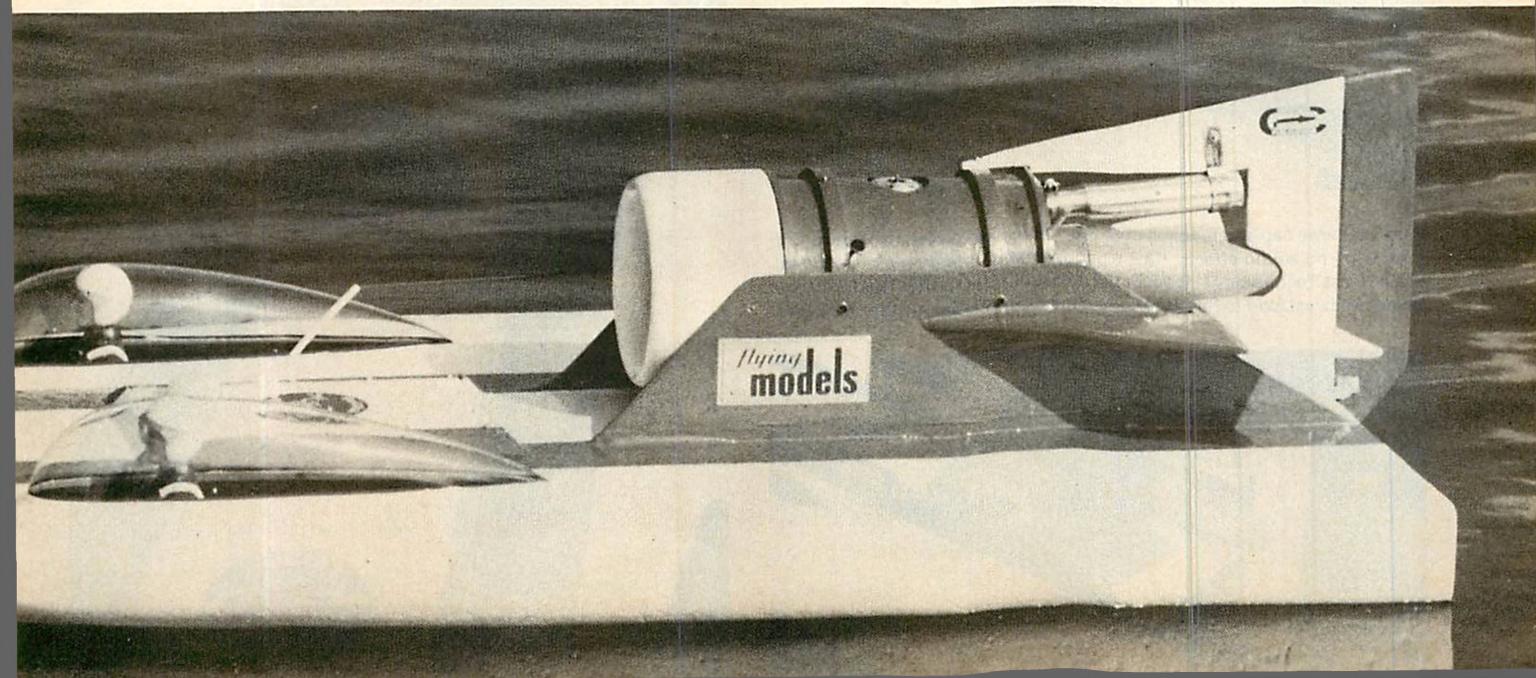
The final step is to install the Axi-Flo, all the control surfaces and, of course, the radio equipment. For this application I chose my Futaba Contest-7 radio which was previously reviewed in detail in the August 1978 FLYING MODELS. The high output servos, with the ball bearing supported shaft make them ideal for model boat use. Best of all is the dual rate features. With it I can selectively reduce the amount of rudder and elevator control throw. The high rate

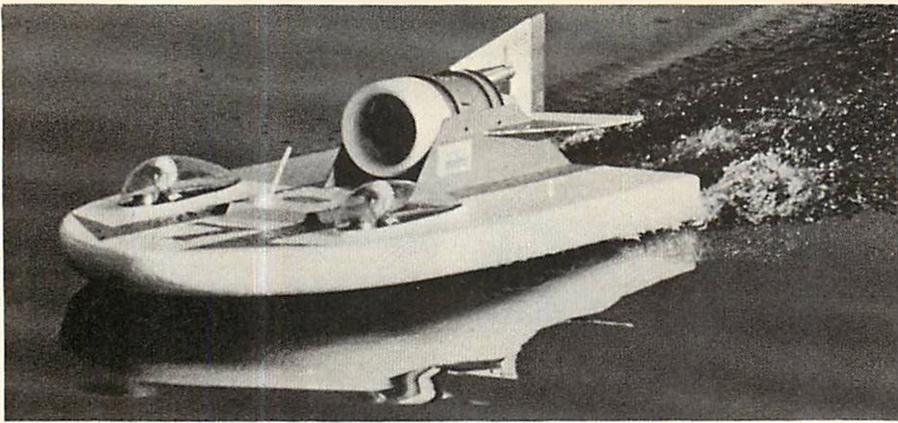




Top to bottom: Slots sliced in the foam hull for passage of the Gold 'N Rod control tubes. The elevator must be split into two controls (two elevators). **Center shot:** MAC muffler and extractor shown connected to K&B 6.5cc front rotor engine. Muffler/pipe can be tuned by sliding rear tube over front one. **Lowest photo:** The RK-40 with MAC muffler attached. Fuel tank is integral part of the duct. Bob uses 25% nitro Aldrich Magnum fuel on K&B 6.5cc mill.

Top shot: Axi-Flo RK-40 power unit being lowered into position to check on fit of vertical tail around fuel tank and muffler. Futaba servos positioned. **Center:** Looking from rear up inside duct, showing the throttle hook-up to the Perry carb on K&B 6.5cc engine. **Photo beneath:** A side view, just floating at ease. The model balances by the letter "D" in the FM logo decal. It runs quite flat, about as you see it in water. A good training boat to start on.





screws (even some on the engine itself). Locktite on all the screws is essential for continued operation. A positive fuel cut-off, separate from the throttle, is a good idea. I couldn't stop the 6.5 after the first run. You can't throw a rag into the RK-40 to stop it. The rudder control proved somewhat inadequate at slow speeds. As such the plans now show a small water rudder extension (to the basic rudder). If you plan on using the Aqueduct on the ice in the winter I would suggest that you enlarge the rudder area by at least 25%. And, of course, add side "runners" to clear the bottom keel.

You will also note in the photographs that a special inlet duct was added to the front end of the Axi-Flo RK-40. This ring is made of a special high density foam and is available directly from the Axi-Flo designer, Mr. Bob Kress. Bob will supply a set of three segments (which make a full ring when assembled) for \$5.00 (address is Kress Technology Inc., 27 Mill Pond Road, Lloyd Harbor, New York 11743). This inlet is essential to the proper performance of the RK-40, be it in the water or air.

The Aqueduct 40 is only a starting point. Remember, I only wanted to prove a basic concept. The rest is now up to you experimenters. Using smaller hull sizes the next generation "jet" boat has to be faster. Larger elevators should afford some form of meaningful pitch control. The new RK-049 (1/2A ducted fan) offers the possibility of a smaller Aqueduct using a commercially available foam paddle board. Another possibility is a catamaran type hull configuration employing two large foam floats connected with aluminum straps or supports. The duct could be installed between and above the two floats. That would greatly reduce the "wetted" area and increase speeds. If you have any additional ideas we would like to hear about them at FLYING MODELS. I'd personally like to see some R/C manufacturer promote this concept by sponsoring some sort of "jet boat" competition. Until then, good sailing!

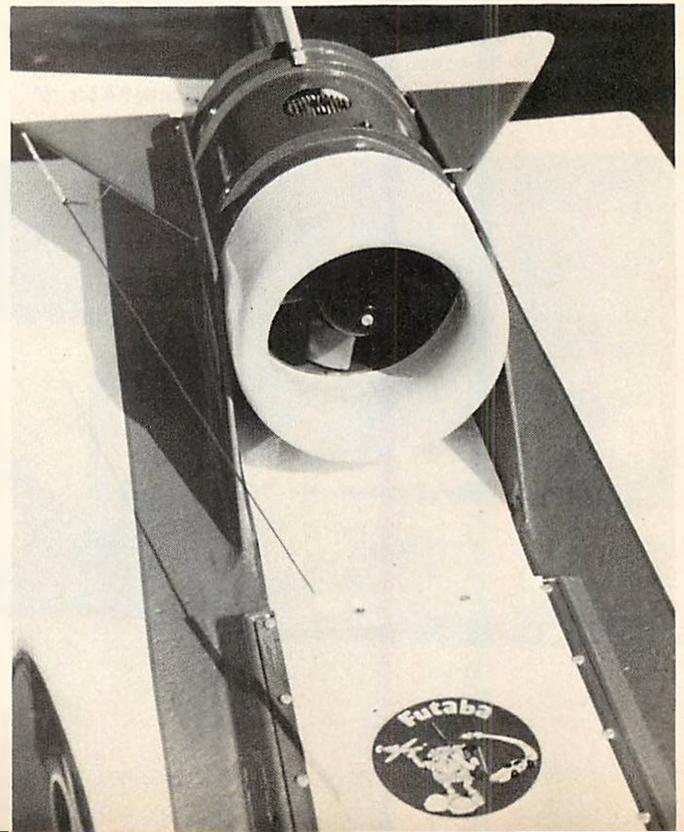
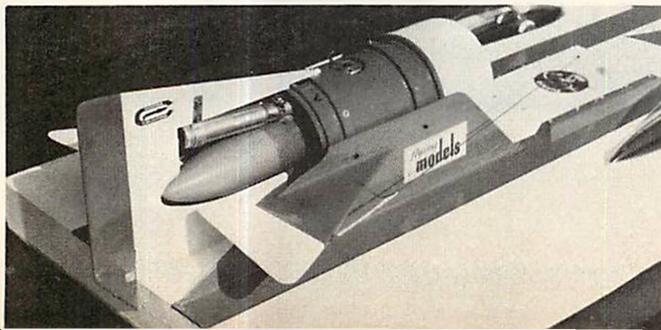
(maximum control throw) can be used for slow speed maneuvering, while the low rate comes in handy for high speed operation (much like a vernier control). After the radio is all checked out I added some 1/8" x 3/8" seating tape around the top frame of the R/C compartment. The 1/8" ply compartment cover is held in place with a series of 1/2" x #6 sheet metal screws. Don't forget to pass the antenna out through the tube before closing the hatch cover. From now on you only have to unscrew the cap to turn on the radio or charge the batteries. Final weight with all equipment installed was 9 3/4 pounds. A little heavier than I would have liked. Balance point was just about at the position of the duct rotor. I did not add any additional ballast since it really isn't that critical in this type of design.

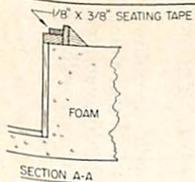
Now for the big moment! How did this experiment work in actual practice? Well it performed just fine right from the start. I won't kid you into believing that it went 90 m.p.h. With all that "wetted" area the initial speed wasn't expected to be fast. But then it wasn't that slow either. With the K&B 6.5cc in the duct the sound is positively "out of sight". If you want to attract public attention at a lake or beach this is the way to go. The

Aqueduct 40 is perfectly stable without any tendency to dig in or roll. It runs absolutely flat out. I have to admit that the elevator, with it's present area, had little affect on the pitch angle of the hull. This I found a little disappointing. A larger elevator (than is presently shown on the plans) would be in order. Or you could simply delete the control and revert back to normal two channel control (rudder and throttle). I personally believe that further experimentation is in order. To increase the speed somewhat you could reduce the hull area just aft of the canopies. The plans show this suggested modification. You might want to stick with the prototype configuration until you get used to the operation, then later you could modify the hull design. Surprisingly enough the duct did not ingest any appreciable amount of water at full speed. When a little water "hit the fan" so to speak it did little to the performance of the engine. I'm not saying you could run it through two foot high waves, but it didn't pose any problem running in 10 to 15 m.p.h. prevailing winds (on Lake Ronkonkoma, Long Island). One problem that did surface with my particular ducted fan was vibration. It wasn't that much, but enough to loosen almost all the



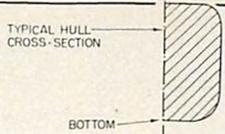
Patti unscrews cap and reaches in to flick on the radio system. Waterproof! Top: Sorry no sound effects, K&B 6.5cc with MAC's muffler/pipe is unreal. Right: Kress Technology 4" foam outlet is essential for top duct performance. Below: Midwest Axi-Flo RK-40, mounted in position. Use Locktite on screws.





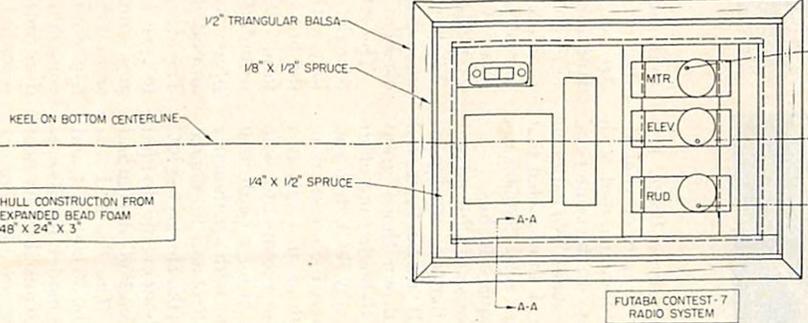
AQUI-DUCT 40

AN EXPERIMENTAL RADIO CONTROL JET BOAT FOR 3 CHANNELS
 DESIGN AND PENCILS BY BOB ABERLE INKED BY D.J.M.
 LENGTH 48" BEAM 24" WEIGHT 9-3/4 LBS.

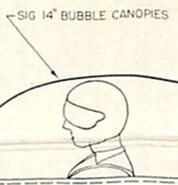
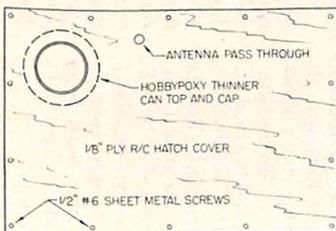
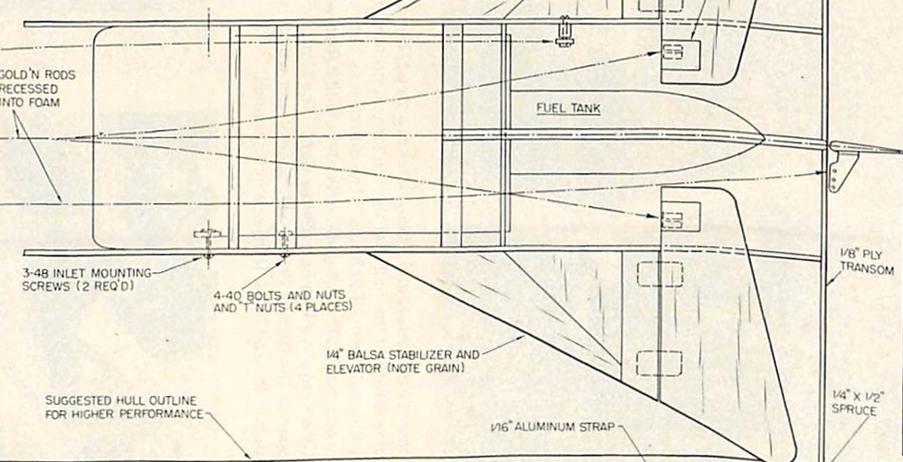


TOP VIEW NOTES
 ONLY THE RK-40 OUTLINE SHOWN
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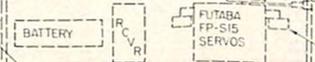
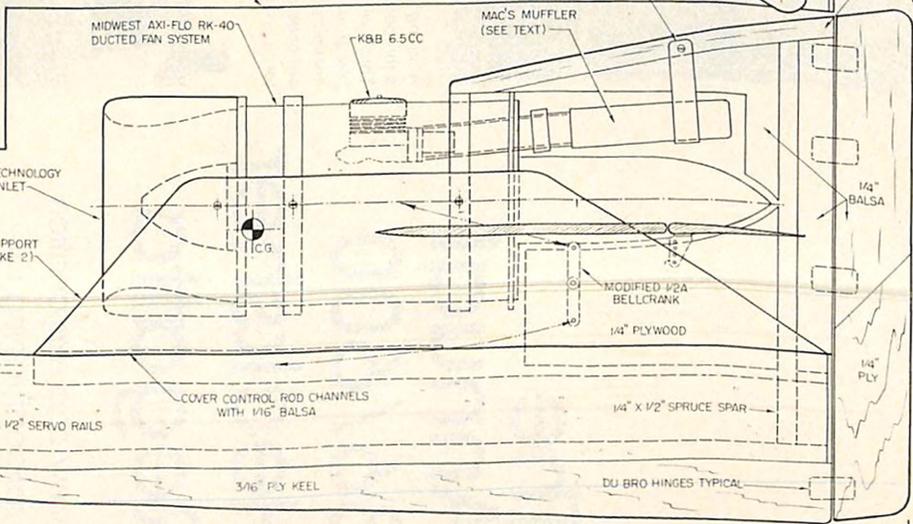
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TOP FRAME OF R/C COMPARTMENT
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3/16" PLY KEEL

DU BRO HINGES TYPICAL

The Annual 36/600 Hecksher Regatta

A view and explanation of sailboat racing by a newcomer to the sailing scene/**George Myer**

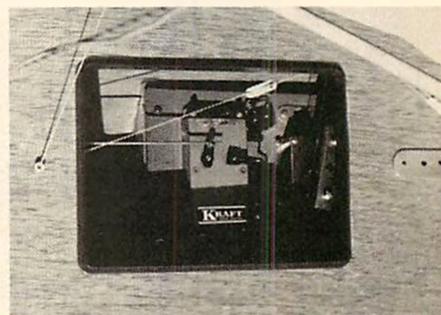
Huntington, N.Y. (settled in 1653) has benefited from a long, close association with the sea and the seafaring tradition. It has grown in a substantial, conservative way. Although a center for social and mercantile activities for centuries, Huntington remains essentially a rural community. In the center of the village lies a park containing a Fine Arts Museum and a man-made pond; gifts of the Heckscher family around 1900 "for the birds and the children". Each Saturday morning "when the water is soft" the Heckscher R/C Model Yacht Club meets at the pond for a few pleasant hours of sailing.

On the 23rd of September the club met for their annual fall regatta. A cool Canadian high had swept in overnight, bringing bright sunshine, clear skies and a northwest breeze. The pond is surrounded by trees and homes, which modulate the breeze to dimensions compatible with the club's 36/600 sailboats. Boats in this class are limited to an overall length of 36 inches, and to a total sail area of 600 square inches. The 36/600 class is a developmental class, which means that the constructors are invited to do almost anything they want, in order to go fast by sail-power, so long as they observe the above restrictions. That sounds simple enough, until you remember that men have been racing sailboats for thousands of years, and a tradition has grown up around it.

When I asked why there were no catamarans, I was told that "the race director wouldn't allow them." Tradition expects



A Soling leads a Pea Pod around a buoy. It takes a steady hand to make maximum use of the breeze. You soon become aware of the fact that the higher you go above the water, the stronger the wind blows. That's why they call them "Tall Ships". The differences between the Soling hull, lying on its side in the foreground and the Pea Pod lying immediately behind it (below left) are easy to see in this shot. Inside the cockpit of Joe Grayson's Pea Pod (below right). The Kraft brick makes a very neat installation. Micro-switches operate the Dumas Probar sail control unit which is capable of developing a 40 inch-pound torque to pull in the sail lines. In to out in 5 seconds.



PHOTOGRAPHY: TIM MYERS

mono-hull displacement-type boats. Hydrofoils need not apply, in spite of what Alexander Graham Bell demonstrated with them about 100 years ago. In the same vein, rule 2 defining the class states "No batten or roach restrictions". Fig. 1 shows what that means. Right off you see why 36/600 sails measure out over 600 square inches.

Rule 3 says, "Spinnakers are allowed and unmeasured, providing that they are dependent of all other sails". If you can figure out how to set and run down those great parachutes that you see flying in front of all the America's Cup races (by R/C), then you can laugh at the 600 square inch restriction. Tradition! Actually, I think that this is a rulemaker's joke, because a competitor who elects to try this sail is in for a battle that would resemble wrestling with a python in a sleeping bag. Nobody fell for it in this regatta.

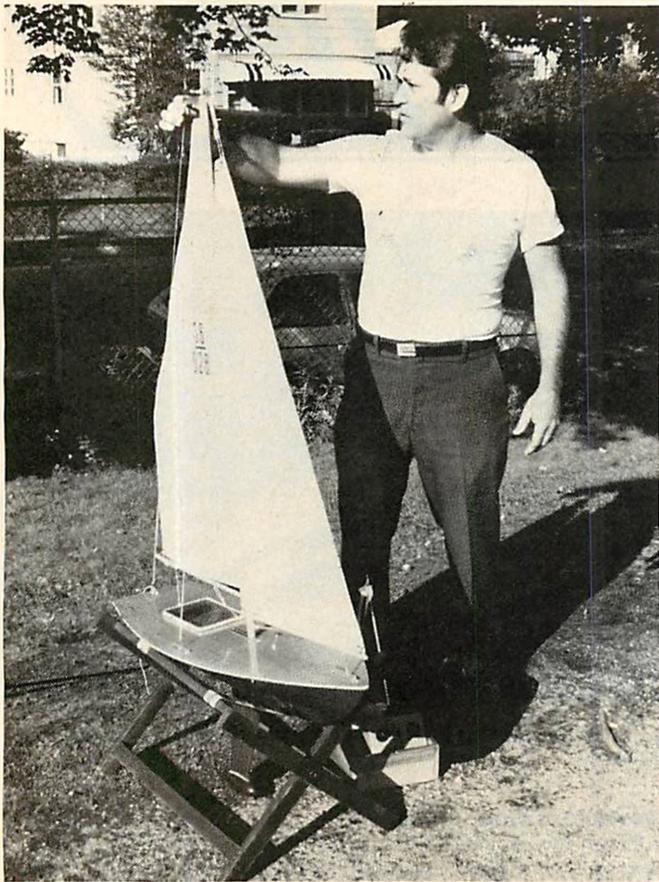
At present, the boats in the Heckscher R/C Model Yacht Club are about evenly divided between the plywood "Pea-Pod" design and the fiberglass "Soling". The Pea-Pod was designed especially for the 36/600 class, and is a very good beginner's model. It sails easily and is very forgiving of mistakes. Its most noticeable design features are a Vee bottom and a very wide deck. The Soling, on the other hand, is a semi-scale model of a boat used in Olympic sailing. It has a rounded bottom and is much narrower than the Pea-Pod. With these differences, the Soling is much quicker to accelerate, and will sail "closer to the wind" than the Pea-Pod.

Most of the heats in this regatta turned out

to be 3-boat races. This is brought about by the fact that practically all of the radios are on one of the three available PRS frequencies: 72.16 (Blue/Wh), 72.32 (Violet/Wh) or 72.96 (Yellow/Wh). The problem is pandemic with all forms of non-aircraft racing, including cars and powerboats. One boat at this meeting was on 27.195 MHz. It didn't have any trouble. Dick Wischer, the club secretary, sailed it well enough to end up in second place *only* after a closely-fought sailoff.

The AMYA race-course is an equilateral triangle, each side being 50 to 100 yards long, as the pond permits. This pond permits the full-sized course. Depth is a fairly uniform 7 feet. Racing is controlled by a tape-recorded count-down. During the 2-minute preparatory period the competitors mill around downwind of the start/finish line. The idea is to be in a position that allows you to cross the line at full speed, just after the gun sounds, starting the race. One trip around the outside of the triangle, plus one trip around the two bouys nearest the pits, constitutes a race (Fig. 2). Order of finish determines the winner. No times are recorded.

Racing began at 10 AM with two Solings and a Pea-Pod. Dick Wischer and Gene Jakobson took off with their Solings and left Joe Grayson to bring up the rear with his Pea-Pod. So it went for the next few rounds. Gene won the first heat, as he has been doing all year, but Dick won the next. The lead kept changing hands all day. Finesse

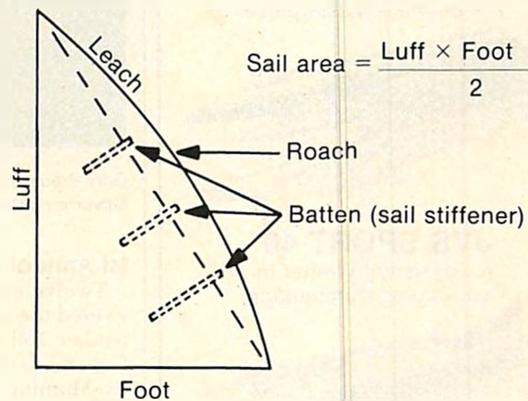


Joe Grayson makes a final adjustment of the rigging on his "finished the night before" Pea Pod. The rural surrounding of the park are evident in the background. Note the cradle used to support the boat. It is a necessary part of the sailors kit.

Hecksher Regatta Results

1. Frank Sposato	8 (temp)	Soling	72.960	Futaba FP-2E
2. Dick Wischer	634	Soling	27.195	Kraft Sport
3. Gene Jakobson	512	Soling	72.160	Kraft "76"
4. Al Schoensteln	67 (temp)	Soling	72.080	Kraft Sport
5. Joe Grayson	628	Pea-Pod	72.320	Kraft Sport
6. Jeff Sposato (10)	542	Pea-Pod	72.240	Futaba FP-3F

Fig. 1 Sail Talk

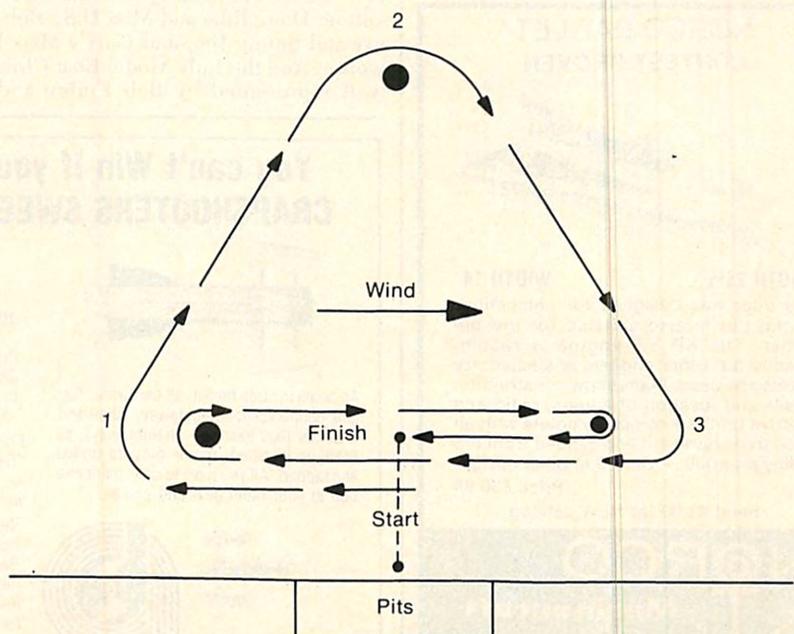


was the most useful tool, because the wind was light and variable all over the course. It was quite common to see one boat charging down the course "wing and wing" (mainsail out to one side of the mast, jib to the other) while 10 feet away another boat sat with its sails limp. Superior skill in sailing to windward in light air finally carried the day for the winner, Frank Sposato. The regatta ended at 1:30 PM, after 11 rounds had been sailed. No protests were recorded. All races had close endings (for the Solings).

I was pleased to renew some old acquaintances at this regatta. Al Schoensteln, club president, was a fellow member of the LIRCS (Long Island Radio Control Society - airplanes) back in the early 1970's. John Patton, one of the race directors, was a fellow member of the L.I. Skylancers (a free-flight airplane club) back in the middle 1940's. In those days we flew airplanes that used real gasoline for power.

Dick Wischer let me take a turn around the course with his Soling. From that experience I can see that anyone can make a sailboat work, but you'll have to learn a lot about sail handling, steering, rules and tactics, if you have any idea about being competitive. One of the nice things about sailing is that there's almost no way to lose or damage the boat. Even if the radio quits, all you have to do is wait for the boat to be blown to shore (assuming that you are in a pond, as we were). If you think you'd like to try it, take a look at the RTS (Ready-toSail) 36/600 just announced by Cox/Sanwa.

Fig. 2 Modified Olympic Course



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Gary Preusse's fine looking and fine running Miss Budweiser took first place at the 1st Annual Indiana Governor's Cup race in Indianapolis.

1st Annual Indiana Governor's Cup

Twelve eager R/C unlimited hydros answered the call "Port Time is on" last September 16th for the First Annual Indiana Governor's Cup that was held in Indianapolis. Morning rains greeted the participants, but quickly changed to bright sunshine, a perfect analogy of the day for the Miss Budweiser of Chicago's Gary Preusse.

Gary's Bud began slowly by spinning out in his first preliminary heat, and then jumping the starting gun in another, but he saved the best for last in out-running the top six entries with a swooping dash for the lead in the traditional "Winner-Take-All" finale.

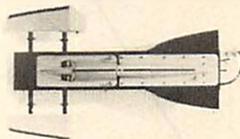
The field of entires was very impressive. From Illinois came Phil Thomas and his Miss Technicolor, Ed Ojenus and Miss Valvoline, Doug Riha and Miss U.S., Bob Preuss and Sunny Jim, and Gary's Miss Budweiser. And the Indy Model Boat Club was well represented by Bob Finley and his

Notre Dame, Shon Casey and Atlas Van Lines, Mike Bryan and Miss Vernor's, David Lee and Shakey's Special and Bill Lefebber diving Miss Budweiser.

Heat 1-A featured a fine steady drive by Fred Honhart. His Gale II was first by three boat lengths over Miss Technicolor, Lefebber's Budweiser has fuel draw troubles all day and Miss Valvoline found the shore and the Vernor's and Atlas did not start.

The fans were on their feet for Heat 1B. Preusse's Bud and Shakey's Special lead a torrid start, renewing a stiff two year rivalry on pure speed. The Bud spun and died in the first turn leaving the Pizza Boat on top but the race was not over. Finley's Notre Dame caught the Shakey's at the end of lap two and the dual was on. Bow to bow sponson to sponson, inside outside they went until the Shakey's regained the lead, but a gust of wind put the Shakey's upsidedown and Notre Dame was the only finisher.

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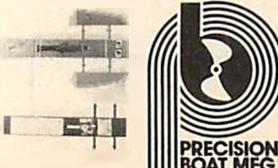
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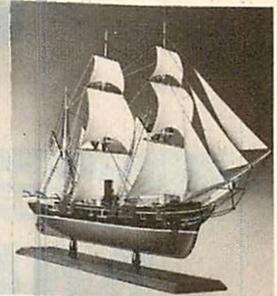
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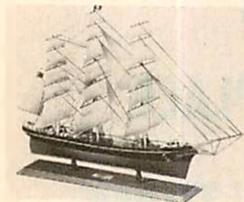
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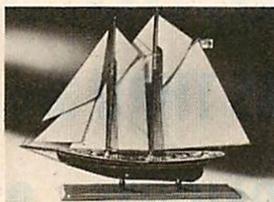
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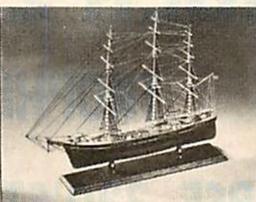
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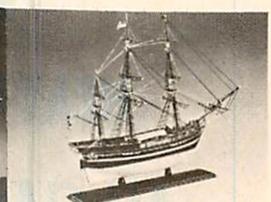
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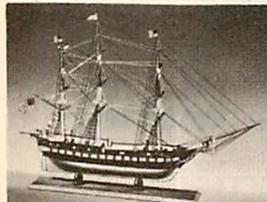
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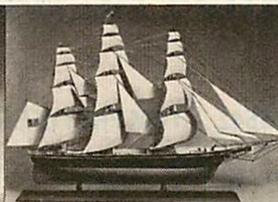
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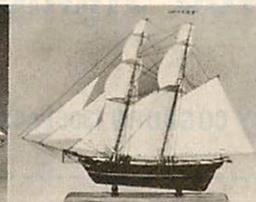
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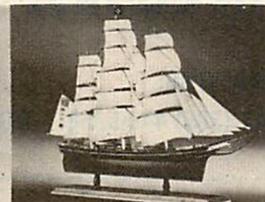
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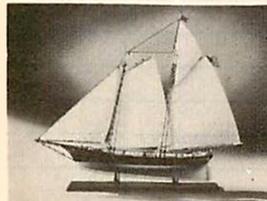
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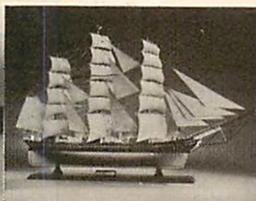
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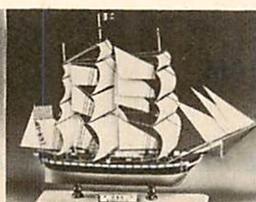
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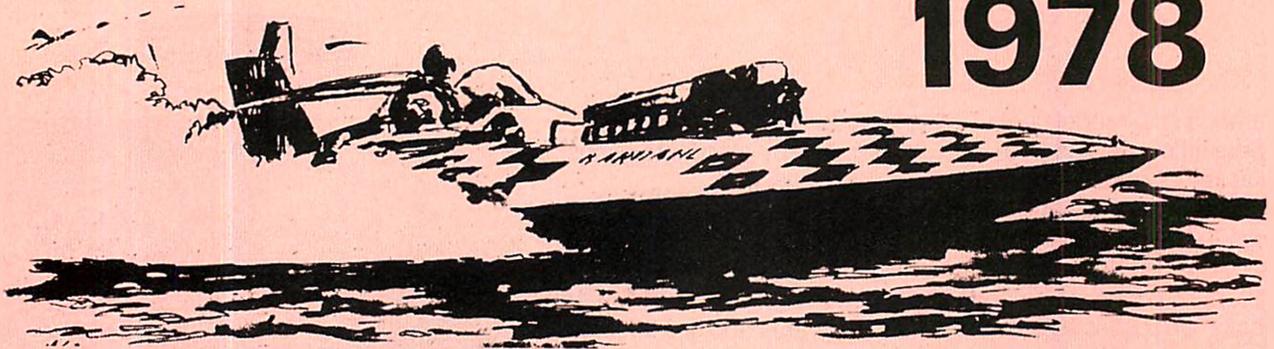


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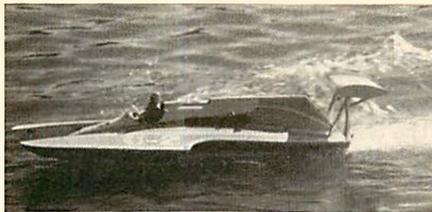
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Doug Riha's Miss U.S. had some earlier problems solved to win the consolation race and take a seventh place overall.



Bob Finley's Notre Dame shows some excellent efforts in scale detail work. Bob took third.

Preusse's Bud took heat 2A in a walk over Miss Valvoline, and the Notre Dame took heat 2B over a fast closing Shakey's Special with Sunny Jim third and the Vernors fourth.

The Valvoline took heat 3A over Gale II but lost his points for not installing the scale engine and Preusse's Bud finished second to the Vernors after jumping the gun with the Miss U.S. third.

The consolation race features a nice drive by Doug Riha. His Miss U.S. came home first followed by Treichel's Budweiser, The Atlas, and the Technicolor.

The final heat lacked the competition seen earlier among the hot dogs, Preusse's Budweiser lead all the way with Miss Vernors second. The Notre Dame had a little



Ron Treichel's Miss Budweiser ran inconsistently but was second in the consolation race and 8th overall.

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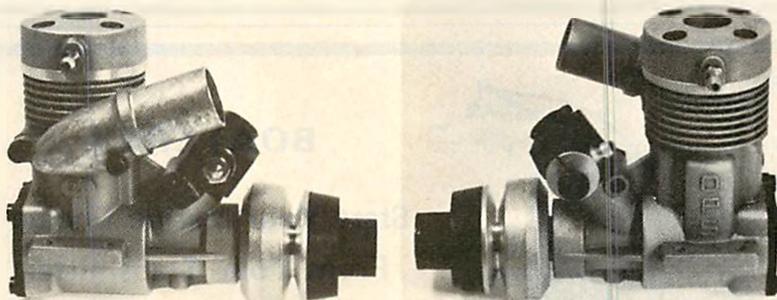
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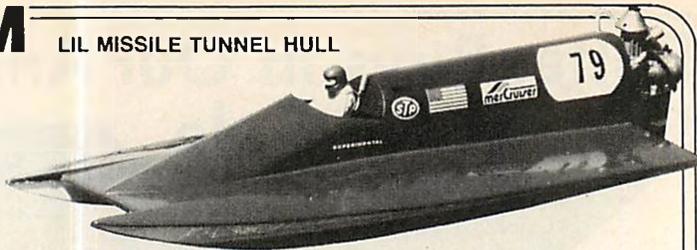
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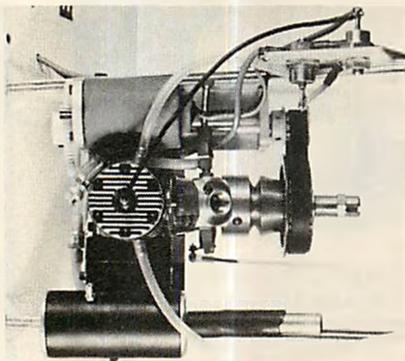
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steering trouble but finished third, Miss Valvoline died in the fourth, Gale II flipped for fifth, and Shakey's Special had problems with some weeds on the launch and missed the start.

The best part of the day was the distribution of the prizes and the Indy Model Boat Club extends many thanks to the following for donating prizes: Steve Muck, Lil Lightning; Precision Boats, El Diablo; International Products, \$25 gift certificates (2); Hughey Boats, Pitch Gauge—DAVID LEE.

Results of the 1st Annual Indiana Governor's Cup

1. Gary Preusse	Miss Budweiser	A&B Scale Hydro kit
2. Mike Brian	Miss Vernors	Muck Lil Lightning
3. Bob Finley	Notre Dame	T.I. Led watch
4. Ed Ojenu	Miss Valvoline	Stewart scale engine
5. Fred Honhart	Gale II	Stewart Skat Kat kit
6. David Lee	Shakey's Special	International Products gift certificate
7. Doug Riha	Miss U.S.	International Products gift certificate
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12. Bill LeFaber	Miss Budweiser	Goldberg Flight box

IMPBA Roostertail

I would like to start out this article with some feedback I received on the proposal to eliminate class A and C. The thought came from Mr. Ken Bergman of Detroit to whom I give credit for his logical thinking versus reaction. He pointed out that there is no difference in singling out the A and C class from some of the other classes that do not compete in multi-boat competition, such as electric and steam classes. Therefore there is no reason to eliminate them from record competition, only limit their multi-boat competition. This is already the case since A races with B, and C races with D class. Due to the conversation with Ken, my recommendation to the IMPBA clubs, members, and executive board is to keep the classes as they are.

I have had several letters discussing rules for outboards. Some have asked what is the IMPBA doing about them? The IMPBA is not the executive board, it is the membership. It is up to them to determine what they would like to do with the class. At present, there are no limitations, which has led to a number of good races with good ideas coming from each. I think that keeping the class open is good and may lead to a set of meaningful rules. There seems to be a large number of ideas which are in conflict with one another such as engine limitations, hull limitations, and course shapes. At the present time we have had a good deal of flexibility. Rules which are very limiting normally lead to conflicts between groups of boaters who have opposing ideas. The IMPBA just finished adding more flexibility to hull classifications and rules by allowing the member clubs to determine the limitations at their contests. In that way, rules which are good for one part of the country need not apply to another part of the country. The flexibility and objectivity of the IMPBA is such that the organization wants to do what the members want, not the members doing what the organization wants.

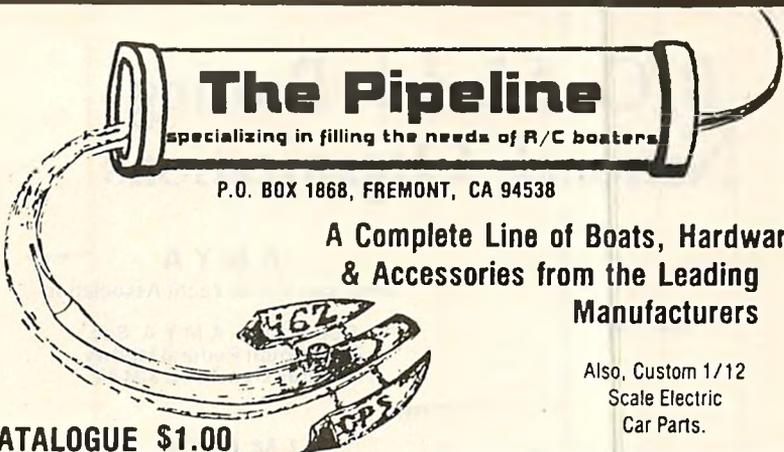
By the time you read this article the

JANUARY 1979

IMPBA will have a new president. Before I pass on the position, I would like to let the model boaters of this country know a few of my disappointments, opinions, and philosophies. I must point out that I am speaking for myself and not for the IMPBA. One of my major goals has been to eliminate some of the barriers that have existed between the IMPBA and NAMBA. I still feel there is room for two organizations without a lot of back biting. For the past two years, I have tried to promote a spirit of good will and cooperation between the two organizations. I have attended a number of NAMBA contests and have made many lasting friendships along the way. The IMPBA over the past two years has made some changes which were in the direction of compromise between the two organizations, such as changing the two boat rules. A very deep and thorough investigation has been made of the NAMBA insurance policy since many have made claims that it is a better policy. If it was better, I felt that the IMPBA members also deserved the same policy. The investigation included lawyers, insurance brokers, and the insurance companies. The results were negative and were revealed to a limited number of NAMBA and IMPBA executives due to the sensitivity of the results. The IMPBA is still investigating insurance and wants to get the best policy possible for the membership. The IMPBA, in the interest of safety, has recently made their safety nets available to NAMBA clubs and has also passed along the source of supply for the nets for direct purchase by NAMBA. The IMPBA, for a number of years, has informed applicants from areas which were primarily NAMBA of that organization and the people who could be contacted for further information. Several years ago, the IMPBA offered membership to NAMBA members for the price of the insurance only. Recently we met with NAMBA officials at their nationals and agreed to having the NAMBA Nationals on a date which has traditionally been the IMPBA Internats. In addition we have agreed to pass along some of the rules we have established in the IMPBA such as the mono rules, clock rules, and the concept of committees for each specific group of boaters. I think that this type of cooperation is beneficial to all model boaters and I intend to continue this relationship. I have enjoyed the working relationship and friendships I have established with the NAMBA members. It turns out that model boaters are the same wherever you go. Pretty neat people!

However, I am personally disappointed because there still exists a very, very small minority of individuals who have continued to try to destroy this spirit of cooperation by practices which are ethically questionable, political, and totally unrelated to improving model boating in this country. Practices which include infiltrating IMPBA member clubs and trying to change their allegiance, purposely establishing new clubs and actively soliciting NAMBA memberships in areas that are primarily IMPBA and then purposely scheduling events on dates which conflict with IMPBA events. This is directly opposed to the IMPBA policy of passing on new members to the NAMBA organization in areas predominantly NAMBA. In addition, statements are made which are against the IMPBA and not true in order to sway the thoughts of potential IMPBA members. I feel that I have held my tongue long enough

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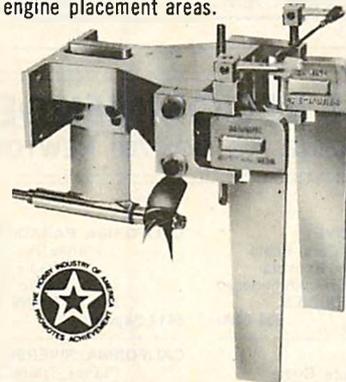
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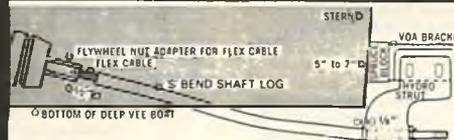
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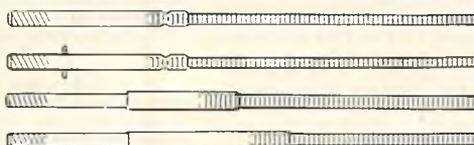


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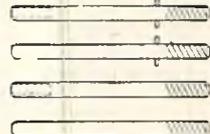
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and that it is time that the membership of both organizations are made aware of this situation. The above actions are intended to create trouble and are an attempt to destroy the spirit of cooperation. Very recently I have been informed of more contacts of IMPBA personnel in an attempt to sway another predominantly IMPBA area over to NAMBA. I am personally upset after having taken many positive actions to eliminate conflicts and generate a cooperative mood that this type of underhanded action is still taking place. I do not feel that model boating has any place for people of this level of integrity. The facts are above. You be the judge. I am at the end of my rope and am no longer willing to turn the other cheek. The IMPBA has done so for the past six years through two prior administrations. I feel that the model boaters have a right to know what is going on behind their backs. I want to make it specifically clear that I do not feel that this is the general attitude of the NAMBA membership. The actions seem to come from the same leaders who only have vengeance against the IMPBA. If you are contacted by these people and would like to hear the other side of the story, please feel free to contact me, as I am no longer the president and am at liberty to disclose all I know.

As a closing note I would like to make it known that it is still my opinion and policy to continue the good cooperative relationships which has been established and not allow the actions of these individuals to destroy it. Let's all work together to make model boating the best hobby in the country. I apologize if I sound a little bitter, but I am not willing to sacrifice the time and effort which has been put into establishing a good working relationship—LEONARD SKWIERA, *President IMPBA.*

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Dual conversion receiver

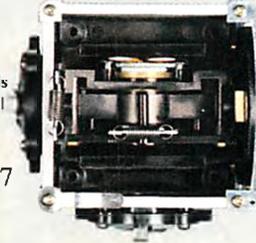
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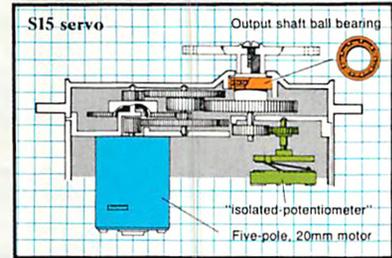
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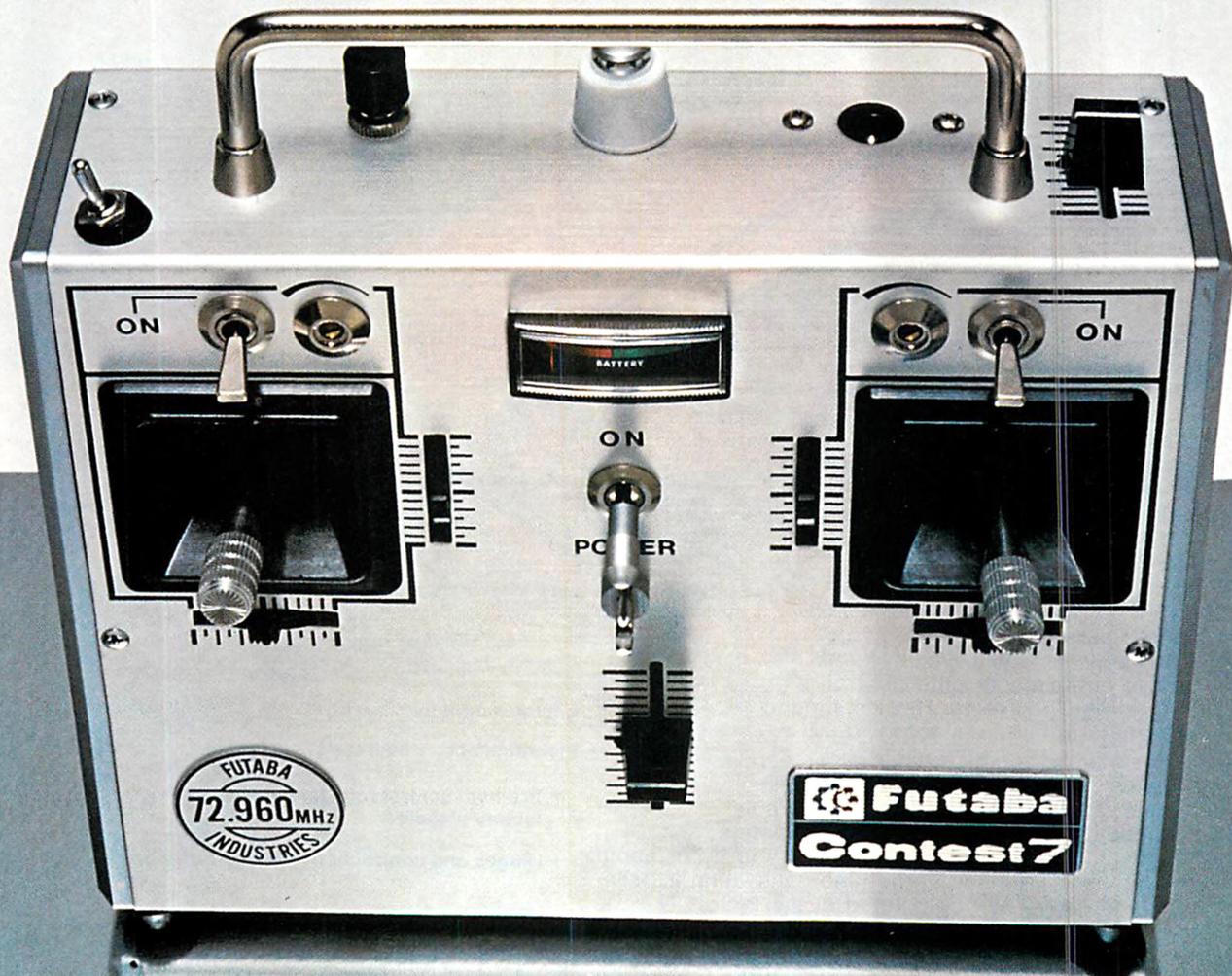


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