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AMERICAN aircraft modeler

AMA NATIONALS AT GLENVIEW



FOR THE TENDERFOOT

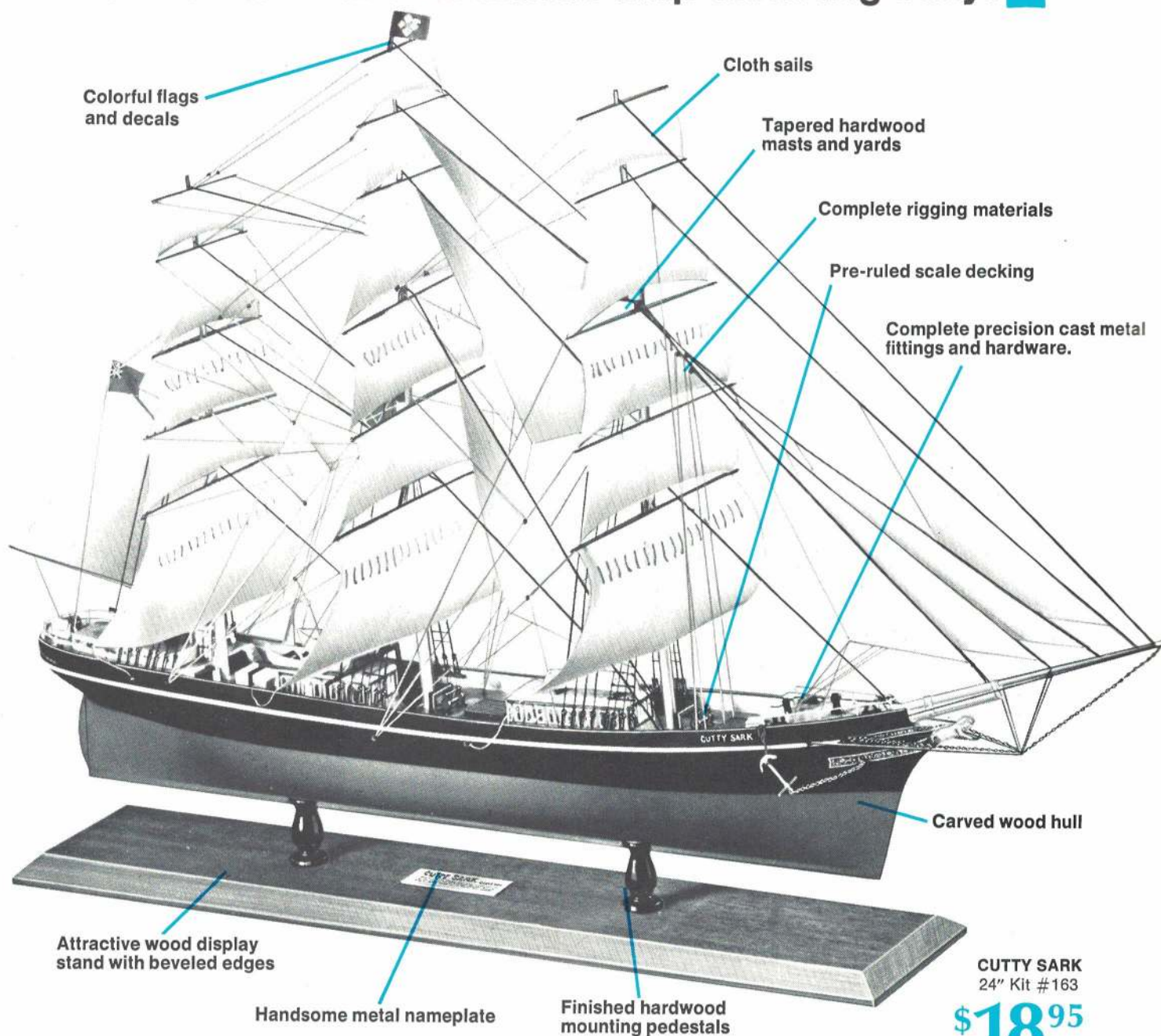
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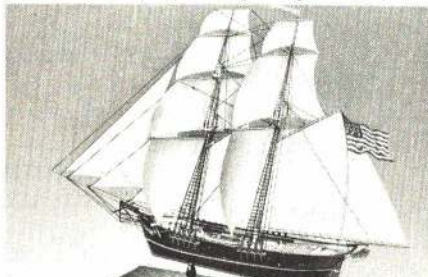
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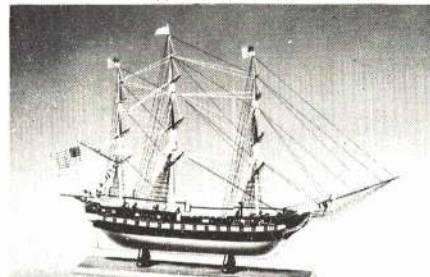
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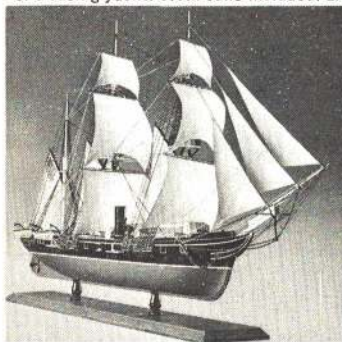
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COVER PHOTO: The all-flying Brown Family at this year's
AMA Nationals. Modeling is a family affair, and they
always attend the Nats. Photo taken by Bill Boss.

WILLIAM J. WINTER — PUBLISHER EDWARD C. SWEENEY, JR.—EDITOR
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Designing the JR. American MODELER is a bit like exploring the moon.

Were we to say that the response to the announcement of JR. American MODELER has been "enthusiastic," it might seem that a lusty bellows was being used to fan a flame. Yet, the response has been enthusiastic, and events confirm there is no need to stimulate interest in a beginner magazine. We'd prefer to use the word "feeling" in regard to response rather than enthusiastic. People—parents, leaders, the industry—have shown us that they feel deeply about beginners and youth. There's a spontaneous dedication, beyond what any of us have optimistically imagined, restoring faith in the social- and self-awareness of our hobbyists—that most of us look beyond our own enjoyment of aeromodeling. The force—the wish to do something, or to support anyone who does—certainly is there, if only it can be given effective focus. Be that as it may, correspondence growing out of this beginner magazine announcement, suggests few of us understand very well what aeromodeling really is all about.

In these days of kits and ready-to-fly models, the chap who fiddles around with original designs and "offbeat" crates is considered quaint. Surely, there can't be many like him, we assume. Well, his number apparently is legion and the oddities of so-called "sport" modeling could well be the keystone of this almost 70-year-old hobby-sport. Should this be so surprising? Aren't modelers supposed to be clever and restless and all that stuff? And wouldn't many want to turn to things other than expensive look-alike aircraft which relentlessly do only one thing?

After looking at piles of pictures and sketches of pushers, flying wings, flying soda cans, 'copters, Rogallo wings, ducted fans, and little novelties in an endless stream, one must wonder about many things. There is, for example, the very real mystery of where and how so many people acquire their savvy of aerodynamics and aircraft design. Surely there are no adequate or meaningful books. No one publishes articles on the subject. Or at least very, very few. And these are so needlessly complex and specialized that they are virtually worthless.

No one ever seems able to describe in simple, practical terms, what makes a plane fly, what governs its performance, and how to derive configurations and proportions for a particular kind of flight. For almost forty years there have been no articles free of their author's self-conscious and imagined need to be impressively long-haired, which loses all of us in the swampy bottom of air molecule behavior and boring and probably useless formulae. When no competent instructors exist we must marvel at the phenomena of countless self-taught modelers.

And why is it that no one knows how many model builders there are? Not since roughly 1940, when the Rockefeller Foundation made a field survey, then finding 1,500,000 to 2,000,000 active modelers, has anyone had the remotest idea. Oh, they guess

learnedly. Does one count the millions of kids who buy read-to-fly balsa gliders and ROG's? Or ready-to-fly plastic gas models? Manufacturers are not even sure how many dealers exist. Each manufacturer hoards his own list, and all presumably overlap.

The growth of competition modeling is impressive, but even the nearly 40,000 AMA members do not constitute more than a small fractional part of the whole. When you look beyond even the amazing number of 800 sanctioned contests a year, and the immediately evident Sunday world of RC flying, there's the hazily-defined area of fly for fun—control line mostly. You don't see much rudder pulse stuff at your flying site, but such systems have a good, ever-climbing sale that even their producers don't understand. Where does it all go, they ask.

At contests you see all kinds of rubber jobs, free-flight gas models, and many specialized variations of control line. And, of course, the very popular radio-control events. But with the exception of some forms of RC, one seldom, if ever, sees any of these types of craft flown locally. Unless you know some rare Wakefielder, for example, who occasionally comes out to test, when did you last see a Wakefield model? Have you ever seen a high-performance free flight bore into the sky from your local field? Or a carrier or speed model on lines? For that matter one seldom sees a little Half-A scale model being flown just for the love of it, suggesting that the overwhelming mass of modelers must be loners, or guys who fly quietly with a buddy or two.

Yes, this JR. AM has evoked a different kind of response: "I would like to know," writes Roger Boyer, "if your magazine could do anything about a problem I have encountered in working with young children. In the old days when we used 'dope' for painting our models, it was just paint. But times have changed and the name 'dope' really raises the children's eyes, and the parent's who were never exposed to the name.

"I would suggest we make an effort to call it 'model airplane paint' and we may all be one step closer to stamping out a very serious problem we have with children today."

We can't call the stuff "dope?" Times, indeed have changed.

What does go on out there? Judging by these letters to JR. American MODELER, modelers with varied interests are to be found in every hamlet. A few months ago, on a quiet Saturday morning, the office phone rang. A woman's voice asked where one could buy a kit of a Wakefield model, or maybe just a plan for which she could buy sticks and paper. It turned out she was going to build a model with her small son—who wanted to build a Wakefield! What gave him that idea? It's a spooky feeling. One wonders if much of our industry isn't competing for the same piece of pie while the rest of the world goes by.

—Bill Winter

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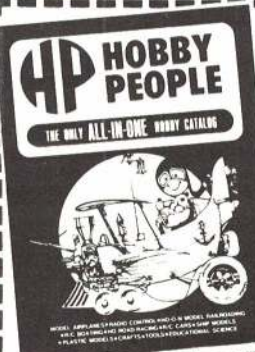


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Too high a price

I fully support your publisher's views, as well as those of John Worth (May and June 1971, "Straight and Level"), on the danger of irresponsible news reporters who, for the sake of a big story, would destroy model flying as a hobby.

However, there is another problem facing us which, on the surface, may not seem as damaging as a "bad press," but which could restrict the growth of the hobby just as badly. The FCC unfairly charges \$20 for a five-year license. In my opinion, this is entirely too high a price to pay in order to enjoy this hobby. Perhaps for those with high incomes, \$20 every five years is not a financial burden. It is for young people with limited funds.

I could put \$20 to better use on my hobby, rather than spend it on a license. As an 18-year-old college student, living totally on money earned a year ago working in a restaurant, I have to pinch pennies.

It is obvious that the reason for such an exorbitant license fee is to scare off a lot of us, as well as to profit off of our love for flying. Who is to say the fee will not be \$40 or \$50 in a very few years? It was only a few years ago that the price was only eight dollars. I feel a reasonable cost would be two dollars for a lifetime license to fly RC. I welcome your comments as well as those of other modelers.

Harvey M. Day, Va. Polytechnic Institute,
Blacksburg, Va.

Bouquets

I would like to compliment you on your entire magazine, most especially the "Tenderfoot" series.

I recently built the Stringless Wonder, and find that it flies unusually well. I also like the ready-to-use pullout plans—AAM is doing a fine job for the modeler.

Garry Hodgson, Scotch Plains, N.J.

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Linda Doyle, Churchville, N.Y.

Yeah, man, let's keep that flying field clean—and maybe not lose flying sites.

—Publisher.

Old time FF

I am gratified to see your efforts to revive enthusiasm for free flight. I was employed by NACA—now NASA—prior to World War II at Langley Field in Virginia. Recently I found a Class C pacer kit, modified the fuselage to resemble a Brooklyn Dodger, and am further adapting the model for ROW competition.

We used to fly "pencil bombers," not unlike your present contest free flights, except we used low thrust lines.

William Burke, St. Peter, Minn.

Dirigible search

I am a happy modeler and have enjoyed your magazine ever since my uncle gave me some of his old editions, which are now worn out. In fact, I liked them so much that I now subscribe to AAM.

I got started modeling when my mother bought me a ready-made SB2C-1 Helldiver. Two years ago, my uncle surprised me with a rubber-powered P-47 and an FW-190, which could be either gas or rubber. I spent many hours on those kits. The Thunderbolt crashed on its test flight. Last summer my uncle brought me three more kits: an F40-1 Corsair, a French Spad and an A-26 Invader, all rubber-powered. I got the Spad and Invader built, but only the former is covered.

Sometime in the near future, I hope to get a radio control unit and build a six-ft. dirigible R-101. I would like to see you print a story and plan for the R-101, because I have searched and searched in vain for plans and pictures of it.

Keep up the good work, because if it weren't for your great book, many people would be lonely.

Ronald Biddle, Blackstone, Va.

Larger, central libraries often have obscure text books on WW-1 and WW-2 aircraft, as well as things from by-gone days, including dirigibles, zeppelins, etc. Your own library may have reference lists and may be able to procure a desired book. Aviation book publishers advertise numerous books in the more popular aviation magazines.

—Publisher.

Old kits

In reply to David Sayles' letter in the August issue: George D. Wanner of Dayton, Ohio, produced the "improved" Baby ROG minus landing gear in 1928. This exquisite and refined kit had a machine-cut and center-drilled five-inch prop and included all tools needed except a razor blade. Later, it was sold with landing gear as an official AMLA kit. Wanner produced kits of all the

winning AMLA models, and in 1934 came out with a series of flying scale models of advanced concept—the plans were done by Harold Crovest.

The Jimmy Allen kits and plans that you got at Skilly filling stations were produced by Country Club Aero Supply of Kansas City. Perhaps some enterprising stations also sold Wanner kits at the time. Hobby shops were non-existent, and I remember finding model kits and supplies for sale in many places.

In the last few years I have researched old magazines, books and plans. That which I thought of very highly back then looks quite primitive now! But these old designs are fun and give satisfying flights; perhaps, since they taught us as kids, they would be fine to teach new modelers now.

The best source of old plans is John Pond, 4135 Avati Drive, San Diego, Cal. 92117. Send him 25 cents for a long list. He will reproduce and return any plan you send him and has many hundreds to choose from for sale. He found an Ideal 1913 Nieuport Monoplane for me.

I am, at the moment, collecting all the plans from the *American Boy* (AMLA), and welcome correspondence concerning any old model data.

Jim Noonan, 7454 W. Thurston Circle,
Milwaukee, Wisc. 53218

Missing plans

I have just acquired a partially completed Stinson Reliant radio-controlled airplane. This model was manufactured by Cleveland Model & Supply Co. and was designated Kit GP-66B. It is a two-inch scale, wing number NC18183.

I am anxious to complete the model. However, there were no plans with the kit, although there are many parts. Therefore I wonder if one of your readers might have a set of plans.

Gary Wohlers, 1762 W. 244 St.,
Lomita, Calif. 90717

Gary's full address is given so that readers able to help can contact him directly.

—Publisher.

Zero bore advantages

I read John Burdick's article on the zero displacement engine (Aug. 1971 AAM) with much interest. However, I must disagree on one point. Although I am sure Burdick researched this project very carefully, I do feel zero bore would have some advantages over zero stroke.

Due to the very fact that the bore is zero, the cylinder lines, casting head bolts and gaskets could be eliminated. This would effect

Jeff Hoot

770-B Everglades St. USNS
Mayport, Florida 32227



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What's nice about modelers like 10-year-old Jeff is that he's willing to try something new. And, when you consider how long modeling has been around compared to how long Monokote has been around, it's still something new . . . especially to the guys who have been covering their models for years with the same old silk and dope method.

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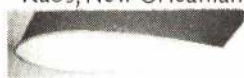


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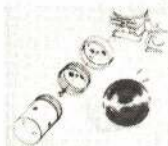


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a substantial weight saving. The piston could then be embossed on the crankshaft for timing and glowplug positioning; the wrist pin and connecting rod could then be eliminated, resulting in even further weight saving.

Additional benefits: a much more streamlined shape would be attained, making it much easier to cowl the engine. Much better fuel induction would result, due to fewer bends for the air/fuel mixture.

The exhaust stack could be mounted to the rear, providing extra thrust. Some testing would be necessary in order to determine if the extra weight of heatproofing would cancel this.

I hope Mr. Burdick will be kind enough to give these suggestions consideration, as I feel they will be helpful.

Jerry Voht, Moundridge, Kansas

Data sheet

Fact No. 1: American Aircraft Modeler has been for some time, and still is, my favorite modeling magazine.

Fact No. 2: I consider myself to have an average sense of humor: i.e., I enjoy a gag or cartoon in good taste just as much as the next guy.

Fact No. 3: If that hogwash about the zero displacement engine in the August issue was supposed to be funny, then I'm afraid you failed miserably.

Perry Knight, Miami, Okla.

Last rites

Some issues back, when the Great Debate (did it or didn't it?) on the GHQ was going strong, we heard from a reader who buried his infamous Q under a tomato plant.

Might I suggest a similar resting place for the zero displacement fantasy?

Livingstone Goode, Mistook, Miss.

The Zero displacement article produced more mail than the discovery of gold at Sutter's Mill. Most people, evidently stung by the innocent entry into the realms of technical fancy, resorted to the dry, tongue-in-cheek "so-you-asked-for-it" letters to the editor. A couple took the thing seriously. Some just got mad. It all reminds us of the time Hewitt Phillips and Herb Weiss demonstrated an indoor model before a convention without wing covering. A flow of electrons from a positively charged wing edge to a negative wing edge eliminated microfilm covering, thus saving weight. So they wound it carefully, while everyone watched with fascination. Then came the big moment! Weiss gingerly poised it for hand launching and let it go. It fell on the floor. Both boys walked off silently. You could hear a pin drop. We still hate 'em! Of course, either a zero stroke or zero bore engine will cost only half as much. No wrist pin wear either.

-Publisher.

Unlimited life

Your August issue was the bearer of tidings of the most astounding breakthrough in the history of model aviation! Only a genius could conceive the stark simplicity of a zero displacement engine.

Despite the production problems inherent in the concept of zero bore, I actually constructed a prototype. I chose zero bore

rather than zero stroke because my drills were dull, and I was able to cast the cylinder with none of the usual problems of by-pass, exhaust, or even cooling.

Needless to say, the bench tests were unusual (to say the least). Not having the usual sophisticated equipment, I can only guess at the rpm's. Would you believe that with whatever prop size or pitch I tried, I was unable to achieve the 55,000 rpm's hinted at in the article!

The most amazing aspect of the engine is that no matter what test I made, I was unable to detect any vibration. My RC gear should have almost unlimited life if I use it in planes with this engine. Never have I experienced such fuel economy—stultifying was the fact that no matter how I varied the nitro content of the fuel, there was no appreciable change in engine performance.

Is there a reason why your author used a pseudonym—and such a transparent one at that? Everyone has heard of John Kcidrub; why would he try to throw us off by spelling it backwards?

Leonard Rowles, Baltimore, Md.

'Junior problem' revisited

For most of my 15 years, I have been associated with model aircraft in some way. As is the case with most kids involved in serious model building and flying, I must attribute most of my interest and skill to my father.

I started into the hobby with ten-cent gliders and cheap plastic models, which my father rewarded me with frequently. I have gradually climbed the steps of progress to the point where I am now an avid radio-control enthusiast who thoroughly enjoys his hobby.

Although my present equipment is only an intermediate set—a Falcon 56 and a Rand dual pak with Citizenship Pulse—it took many hours behind a lawnmower to reach this goal. Which brings me to some comments on the age-old "junior problem."

The trouble in many instances is over-eagerness to jump into full-house digital equipment without the slightest knowledge of aerodynamics or building techniques. Instead of starting out with a 29-cent Slick Streak, kids get all fired up about buying an Orbit proportional rig with a Sherlock Lear Jet. They take a trip to the nearby flying site, where they are awed by the largest and most expensive airplane, rather than the simplest and easiest to build. After all—what kid wants a stick-and-tissue model when he can have a quarter-scale Cessna 310? But most young kids are impressionable and have very short attention spans. Better to have one lose interest in a five-cent glider than in an RC set.

If we are to analyze the old cliché, the "junior problem," we must first investigate the background experience and knowledge of each case. Let us not forget that it all started with a block of wood and a knife. If a kid cannot, or does not want to, make a small glider, then chances are that he will not see a larger project through. We must now try to distinguish between the youngster who is genuinely interested in model aviation, and the kid who is impressed by all the buttons and levers on a full-house transmitter.

Although I have reached the point where I am fairly successful with radio control, I still find time to make a little glider or rubber-powered model now and then.

Frank Lost, Camillus, N.Y.

You'd expect to pay four hundred dollars for such a radio

RCM Magazine says (November 1971 issue Product Report):

"As a conclusion to our tests of the Hobby Lobby 4 radio, one would expect that a digital proportional system with a price tag of \$200 could not possibly equal the "higher priced systems". Nothing could be further from the truth. The Hobby Lobby 4 proportional system equalled in performance and quality any of the radios we have tested to date and, in fact, surpassed a number of them"

The control sticks have adjustable tension and will center perfectly even when adjusted for only 2 ounces of control pressure.

It's a complete 4 channel outfit with transmitter, receiver, 4 servos, nickel-cadmium batteries for transmitter and receiver, and built-in charger.

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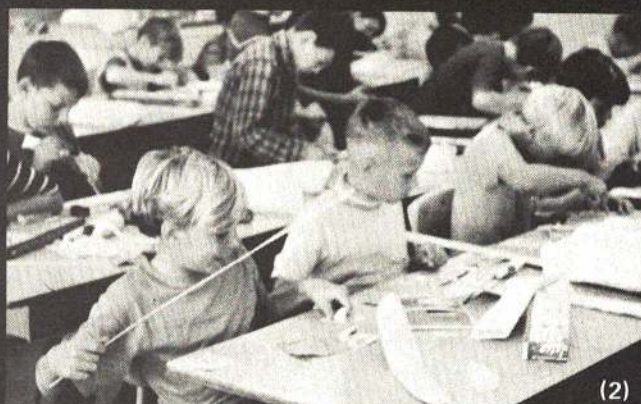
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ON THE SCENE



(2)



(3)

(1) This happy lad just made his first flight. (2) Typical classroom scene with much real concentration. Many had never made a plane before. (3) Would you believe, three of the proudest modelers in California. (4) Fly Angle, an AAM Tenderfoot feature many issues ago, was the "advanced" plane in the course. (5) Getting the wings on straight. Jetco 20 used as first model in the course. (6) Time for the class picture, and as one might guess, some students were good modelers already.



(4)



(5)



(6)

WINGS AND THINGS—IN THE CLASSROOM

by NICK PANAGIOTOU

Just think, teaching youngsters how to build flying model planes four hours each day, five days a week—and getting paid for it as well.

This is the assignment I had at summer school this year. There were 152 boys and two girls in the four classes. The object of the course was to teach these nine-to twelve-year-olds some of the basic facts about airplanes and aviation. I set out to accomplish these goals by two means: first, model building and flying, and second, discussions and films.

Several weeks before summer school started, I chose two projects for the course—a Jetco 20-in. glider, and a Fly Angle, published in *American Aircraft Modeler*.

From past experience in model building classes, I found that all the students need to be taught how to use a razor blade, a sanding block, and the importance of lining parts up correctly while gluing them together. It is amazing how many different versions of the same glider design can result from inex-

perienced young builders. With nearly forty students in each class, I was kept hopping all the time—helping students do things correctly and trying to prevent any building blunders.

At the end of the second week, most of the students had finished their models and were ready for the scheduled contest. Each class was taken separately out to the school playground and the students began launching their gliders. It was there that we experimented with the proper methods of hand launching and finding the best balance point for each glider. The contest continued for three days, so all the modelers were given a chance to fly several times. Following the contest, the first place winner of each class was presented a trophy; the second and third place winners received color prints of Boeing aircraft.

At the beginning of the third week of school, I wound up the rubber motor of my Fly Angle and let it go across the room. As it zoomed above the heads of my students, they

showed much excitement and I knew that they would be eager to start on the second project of the course. I had prepared enough copies of the plans for all the students and the students had brought their supplies, so they went right to work. Templates for the various bulkheads and the fuselage parts were provided so that each student could make his model more accurately.

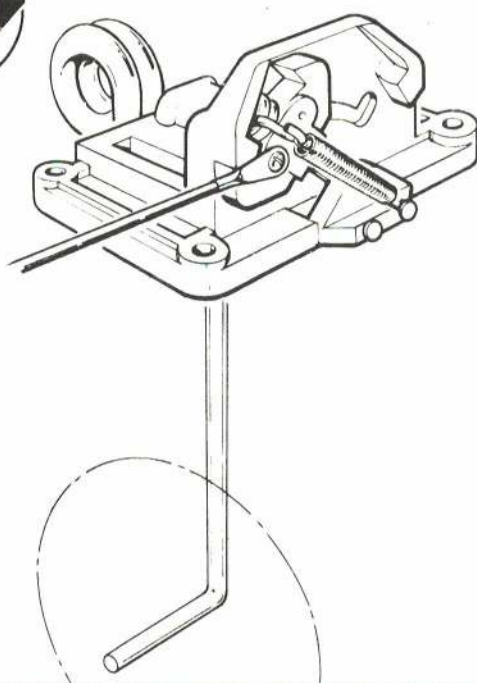
After a few days, some models began to take shape and the students began helping each other on their projects. Now I could begin to relax a little, so I brought an Old-Timer model which I had partially completed and began to work on it at school.

During the fifth week of the course, several Fly Angles were finished and test flown. Most of the models suffered from a poor papering job, but this was to be expected because of the students' lack of experience.

A contest was scheduled for the Saturday
(Continued on page 97)



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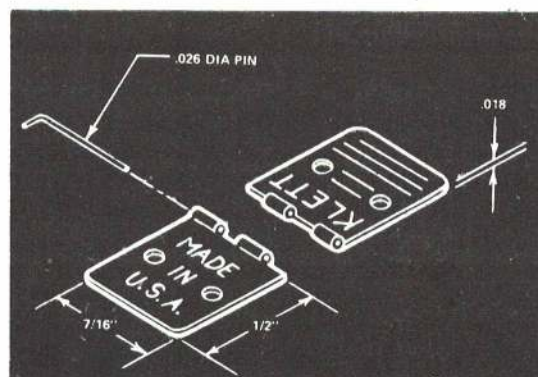
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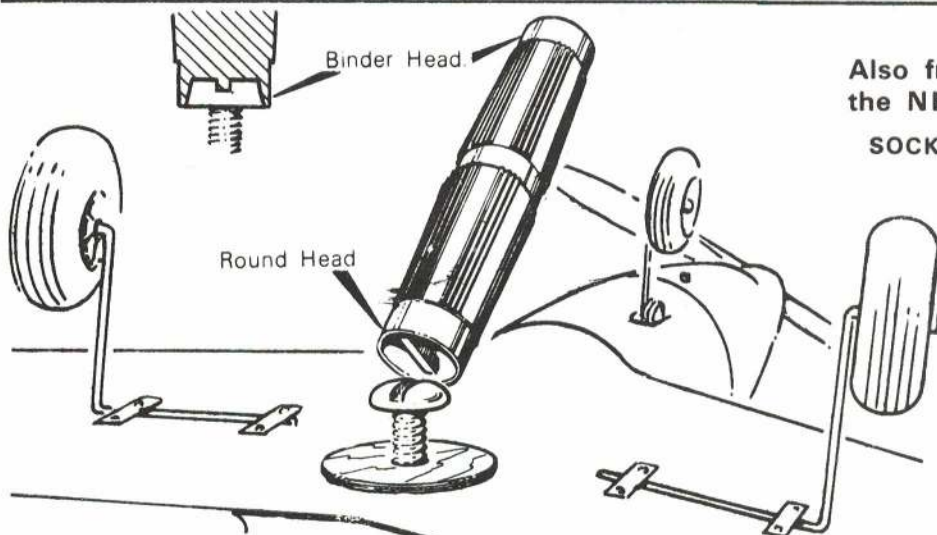
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Longster

This big free-flight model is scale in dimensions, construction, and detail features.

Even has shock-absorbing landing gear.

by ROBERT HARRAH

This 1933 design has the look of the thirties that is now considered old, but truly "classic." Known as the Henderson Longster, it was powered by the Henderson motorcycle engine. Les Long may have designed a ship similar in all outward appearance to the Aeronca of the same period, but close study shows some outstanding and unique features that should be credited as "originally Les." Every effort was made during the development of this scratch-built scale to maintain much of the inner design features, rather than end up with a scale model by outer measurements only.

A comparison of the vital statistics of a plane of the thirties and the flying machines of the seventies is almost enough to make me want to go back. The data and specifications necessary to build a modern plane would probably outweigh the gross weight of the 575-lb. Longster. The 363-ft. high Saturn moon rocket, laid on its side, would be more than enough to handle the 200-ft. takeoff run required by the Longster. This same rocket will send the astronauts flying to the moon at speeds in excess of 75 mi. per min., while Les

listed the high speed of the Longster as 75 mph. To consider the 6,000,000-lb. Saturn as a comparison may seem unfair to some, but it is spectacular—as were the barnstorming pilots, like Les, flying these classics of the thirties. Fifty years ago radio was just being used; now we see astronauts via color television barnstorming the moon.

So, you may ask, why build? To me, it gives those few hours to remember when—and to wonder what the next forty years will bring. Man may be beyond the early dreams

All flying wires are functional and require careful pre-flight checking and alignment.



to fly like a bird, but I am hopeful that sharing this heritage with our mind and hands now and in the future will never change. So let us get to building a classic of old and have some fun.

Construction

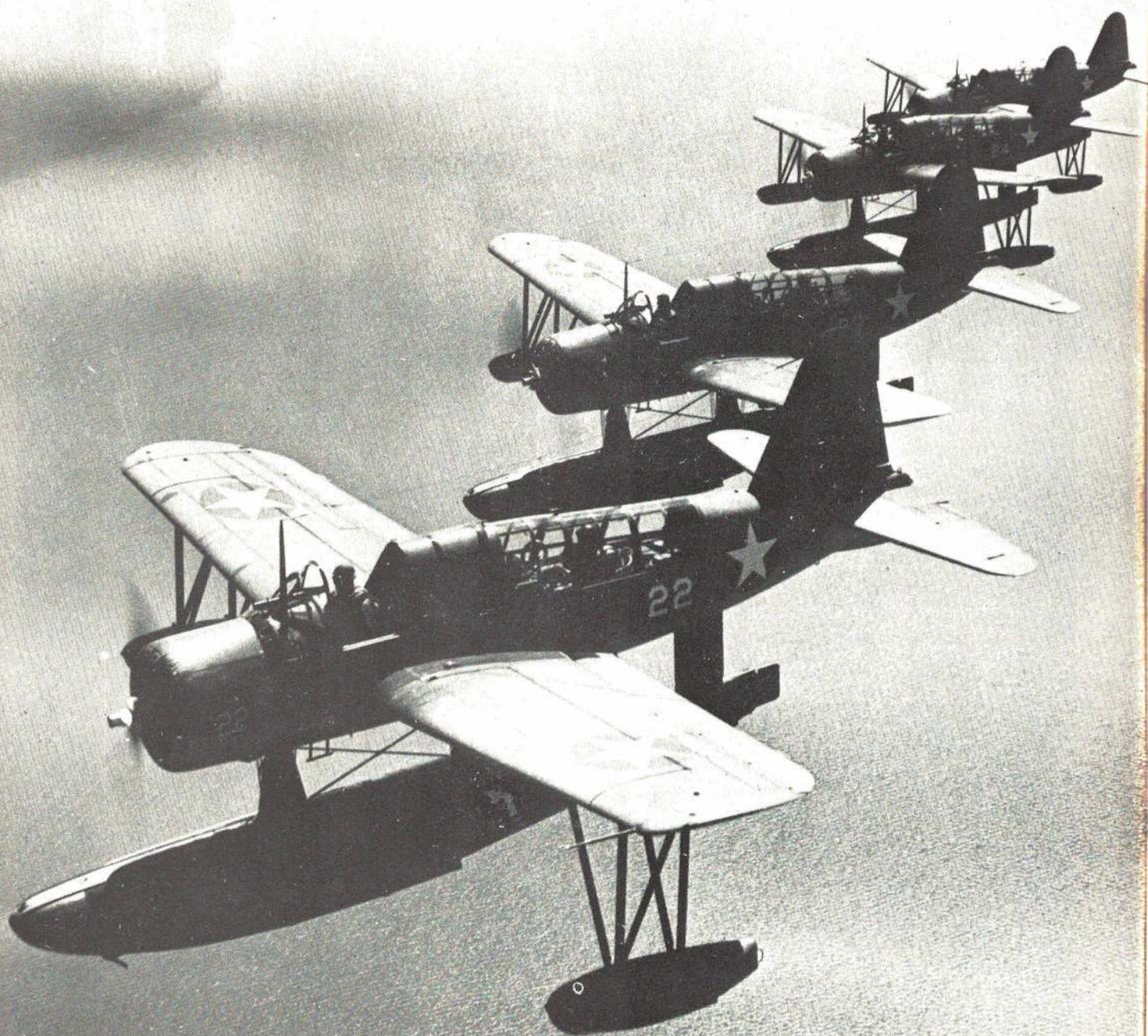
A flat surface topped with a piece of Celotex (minimum size 24 x 36 1/2"), rubber bands, X-acto saw, sharp blades and pins are my standbys. I like to save my plans, so a bit of waxed paper, MonoKote backing or an old polyethylene bag spread wrinkle-free over the plans preserves them and saves sanding the plans off of the plane. So my family can't claim glue-sniffing, I use white or Titebond-type glues. I found that a fifty percent solution of these water-base glues, diluted with water and then brushed over all surfaces after final sanding, increases the strength considerably with the addition of little weight.

Glue is a subject in itself, and I would like to share some thoughts and findings in this direction for your scrutiny. Engineering, design, and strength require that a glue be

(Continued on page 84)



KiNGFiSHER



Seeing service with all scouting and observation units of the Navy during WW II, more than 1500 OS2U's were produced by Vought-Sikorsky and the Naval Aircraft Factory.

by DON BERLINER

Hardly anyone remembers the Vought-Sikorsky "Kingfisher"—except those guys who were plucked out of the cold seas after their much more glamorous Corsairs and Hellcats let them down. And the lonely GIs at all those forgotten weather, radio and radar stations on miserable little islands all over the Pacific who got their treasured letters from home in mail sacks tossed out of the observer's hatch. And the seamen on merchant vessels which would have gone to the bottom, had not the alert eyes of a Kingfisher crew spotted the German sub in time.

Obviously, then, to a lot of people the Kingfisher was the most important airplane since the Wright Flyer. Yet to most, it remains one of the obscure airplanes from an era full of famous ones. It wasn't very fast, did little damage to the enemy and it didn't even look very unusual. In fact, it was a real "plain Jane" that served with the fleet in the early part of the war and then got upstaged by progress.

Surprisingly, though, the Kingfisher played an important role in the development of aircraft construction, having been the first airplane to have a non-buckling fuselage using spot-welding in its primary structure and proving the value of what quickly became a standard technique. When the U.S. Navy placed an order for the first of more than 1500 of the scout planes, it was considerably ahead of its time—at least in its class. Unlike prior scouting types, it was a monoplane and it was powered by what was soon to become the extremely popular 450 hp Pratt & Whitney Wasp engine.

The first one was delivered to the fleet in mid-1938 and quickly passed its trials, with the only major modification being the addition of a wide-chord strut at the rear of the single main float for added strength. It immediately went into production; the first OS2U-1 was launched by catapult from the battleship Colorado in August of 1940.

By the time the United States was bombed into WW II, a year and a half later, all scouting and observation units of the Navy were equipped with the OS2U. Some of the most graphic and classic pictures of the attack on Pearl Harbor show Kingfishers burning on the ground—a very bad time.

But soon the U.S. went on the offensive, attacking, capturing and then using island after island, and the unglamorous Kingfisher was there. It shot off battleships and cruisers:

to seek out the enemy, report back, and then direct the heavy guns of the approaching task force. It kept an eye on carrier takeoffs and landings, ready to come to the rescue of pilots who suddenly found themselves wet and helpless, and, as such, was the forerunner of present day helicopter rescue operations.

Leaving a ship was a jolting experience, as the scout plane, its engine roaring, was sent away with the same charge as fired a five-in. shell. Returning to the mother ship, the Kingfisher would land in the slick created by the sudden sideways motion of the ship, then

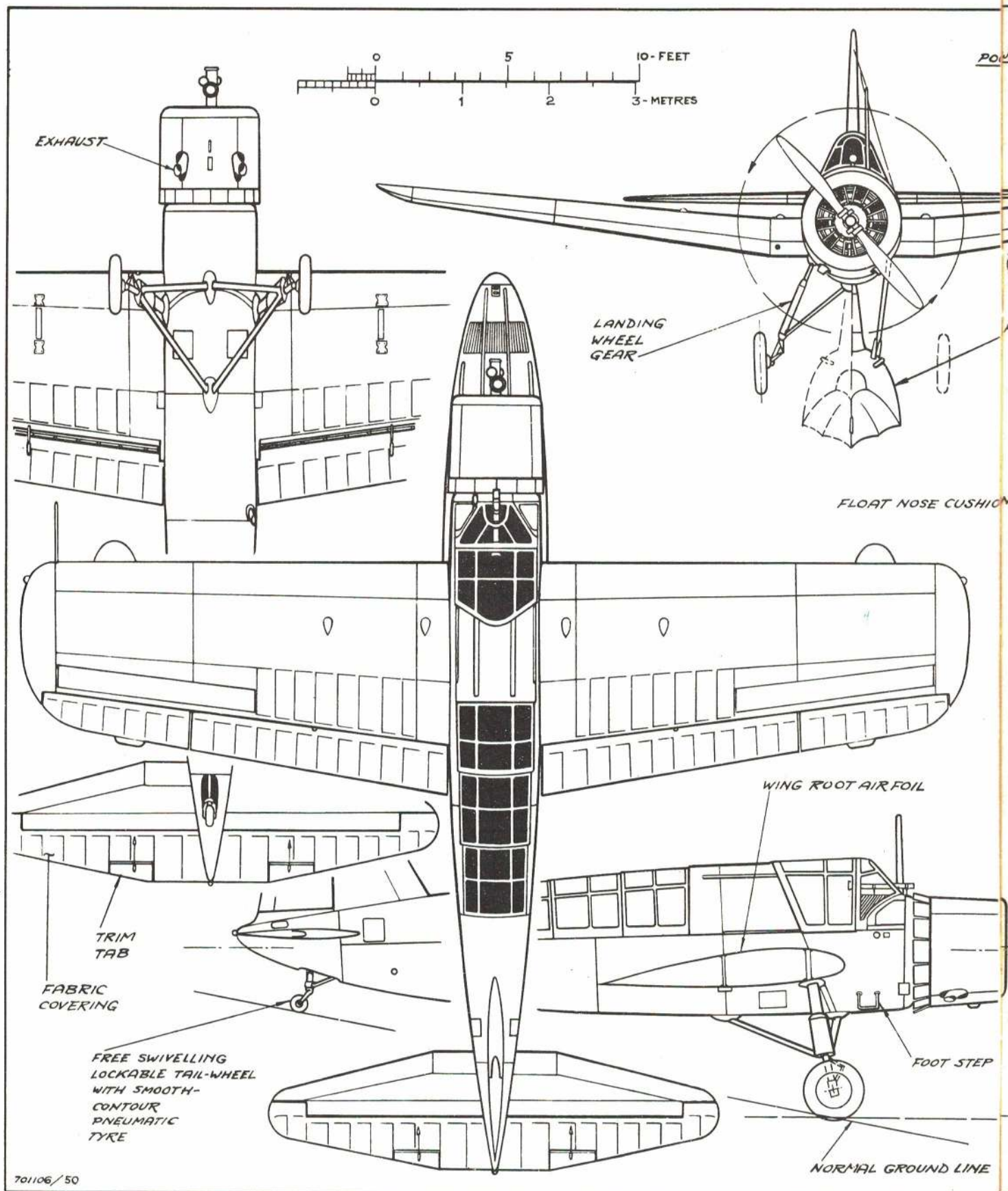


a hook on the bottom of the main pontoon would catch a rope-sled trailing alongside the ship. A crane would then swing over the side, lower a hook to be fastened to the fuselage, and the plane would be hoisted on board.

On rare occasions, a Kingfisher or two was called on to wage offensive war against the enemy, though it certainly hadn't been designed for combat. One OS2U pilot got credit for shooting down a Japanese Zero fighter during the bombardment which softened up Iwo Jima for the invasion of that island in February, 1945. The excellent maneuverability of the lightly-loaded scout plane enabled Lieut. (jg.) D.W. Gandy to evade the Zero's attack and then get on its tail and shoot it down, the faster fighter crashing into a cliff. When the U.S. was fighting off the Japanese in the Aleutian Island chain extending westward from Alaska, several

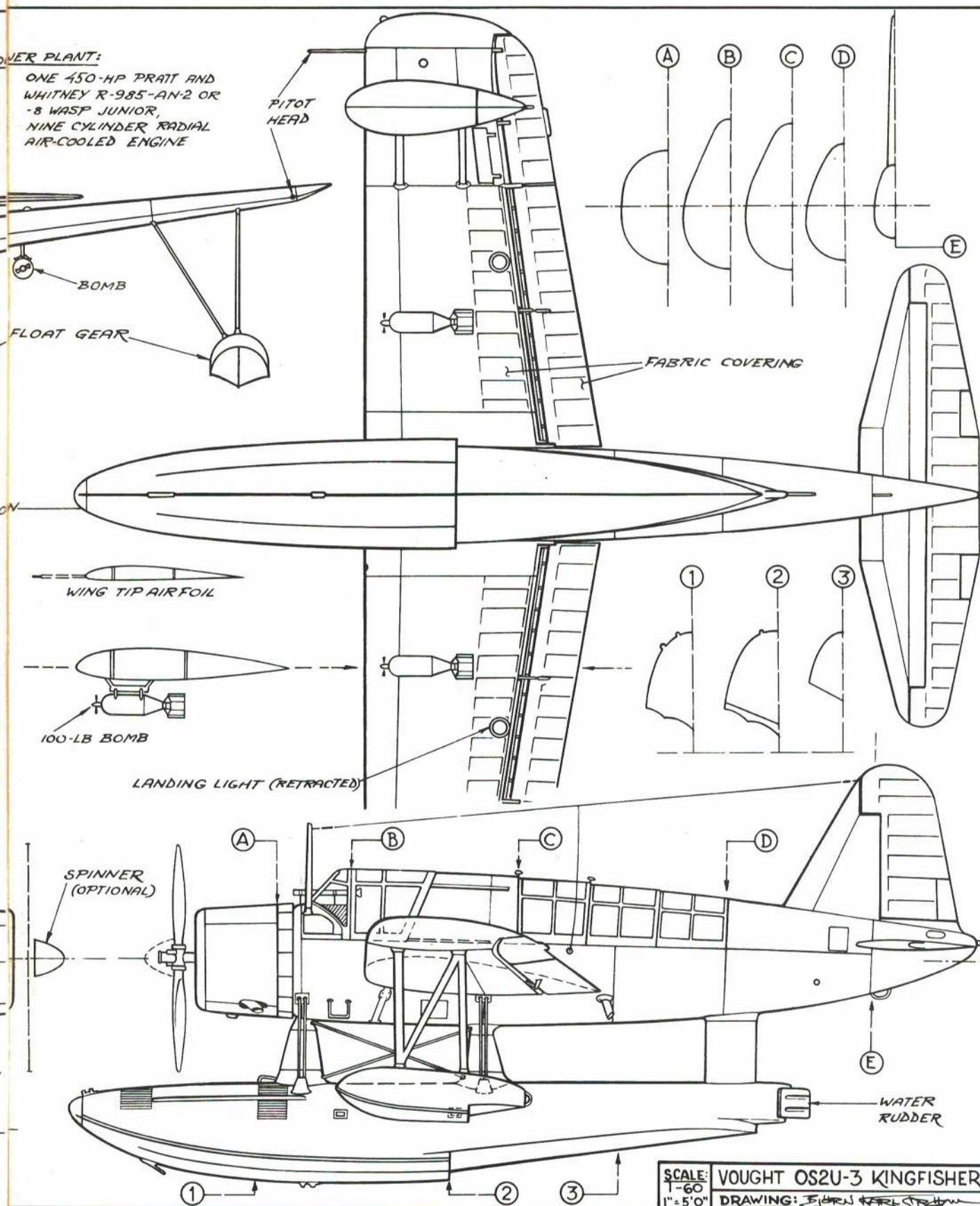
Although most Kingfishers were float-equipped for catapult launching from battleships and cruisers, the OS2U also could take wheeled gear for carrier and land operation.

(Continued on page 68)



POWER PLANT:

ONE 450-HP PRATT AND
WHITNEY R-985-AN-2 OR
-8 WASP JUNIOR,
NINE CYLINDER RADIAL
AIR-COOLED ENGINE



BIPPI-BIPE

Here's Galloping Ghost fun for quiet evenings.

With the rapid development of the multi-proportional radio control systems in the last five years, the simpler and less expensive types of RC modeling have suffered from a lack of publicity and suitable model development.

The RC rudder-only, rudder/motor, and galloping ghost unit types, however, do have certain advantages that more modelers should be making use of—light weight, small size, low cost and easy installation. The GG package offers three controls: rudder, elevator and motor—with a total airborne weight only slightly more than many rudder-only units. By comparison, a proportional three-channel outfit is twice as heavy, twice as bulky, and more expensive. And, of course, it is much more sophisticated in control action. However, for many model applications, the R/O, R/M, and GG systems are just the thing.

The Bippi-Bipe is a small, compact biplane designed to utilize the advantages of the galloping ghost RC units now available. As a biplane, it also offers more of a challenge than the usual trainer-type GG model. The Bipe is a sturdy model with good flight stability, but capable of fast and exciting stunt flying as well.

A notable feature of the design is the cabin fuselage which provides plenty of room for the RC installation and a sturdy mounting for both top and bottom wings. The constant chord wings are identical except for length and center section. The top span is 34", length is 29", weight about 22 1/2 oz., with a wing loading of about 10 oz.-sq. ft. The engine installed is the O.S. Max 10 RC which is lightweight, provides good top power, and throttles very well to a low idle.

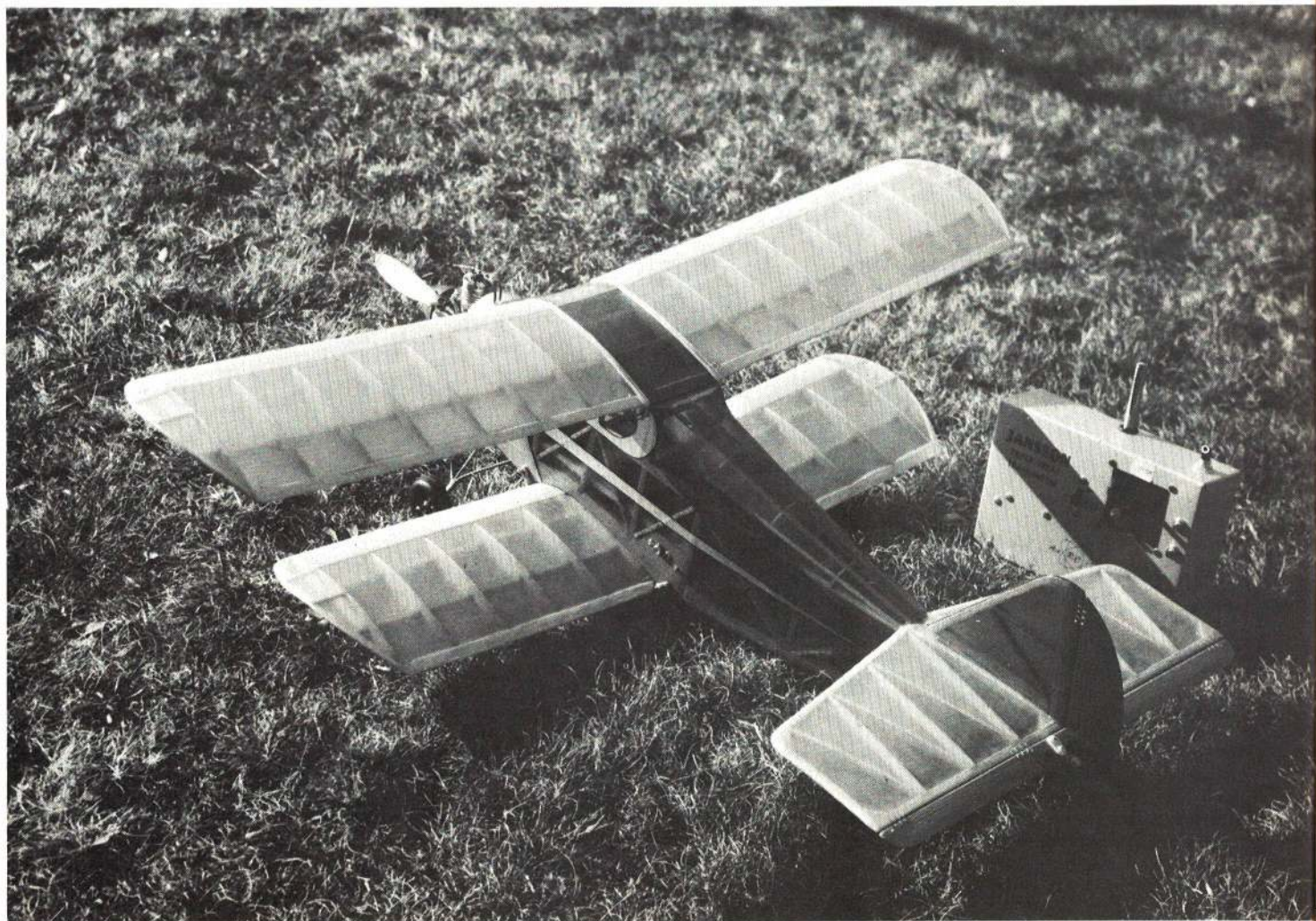
Before covering it is wise to complete the equipment installation. Diagonal bracing makes the fuselage quite strong but light.



The radio gear used is the packaged galloping ghost unit manufactured by Ace Radio Control, Inc. The airborne equipment consists of Rand GG pulser and switcher, Commander DE superhet receiver, and 2.4 V NiCad battery—weighs a scant 5 1/2 oz. Originally, the Jansson GG No. 2 transmitter was used, but was replaced by the Dickerson Pulse Commander Tx when this much-improved unit became available. The Pulse Commander is not only electronically better, but is smaller and has better balance—so important for one-handing it while launching the plane. In all, the GG system is an enjoyable way to provide a lot of control.

Wonder why it was named the "Bippi-Bipe"? The "Bipe" should be self-explanatory—but the "Bippi"? Ever listen to a GG Tx signal on audio monitor and hear the bip-bip-bip? That's why. Any questions, Goldie?

The basic design for Bippi-Bipe had its beginning a number of years ago with an 049-powered free-flight Sperry Messenger (the obscure aircraft which became so popular that one magazine ran three different models of it). The Messenger was eventually converted



On high throttle Bippi is rather fast—so a beginner may “get behind the airplane.” More skilled hands will love its stunting.



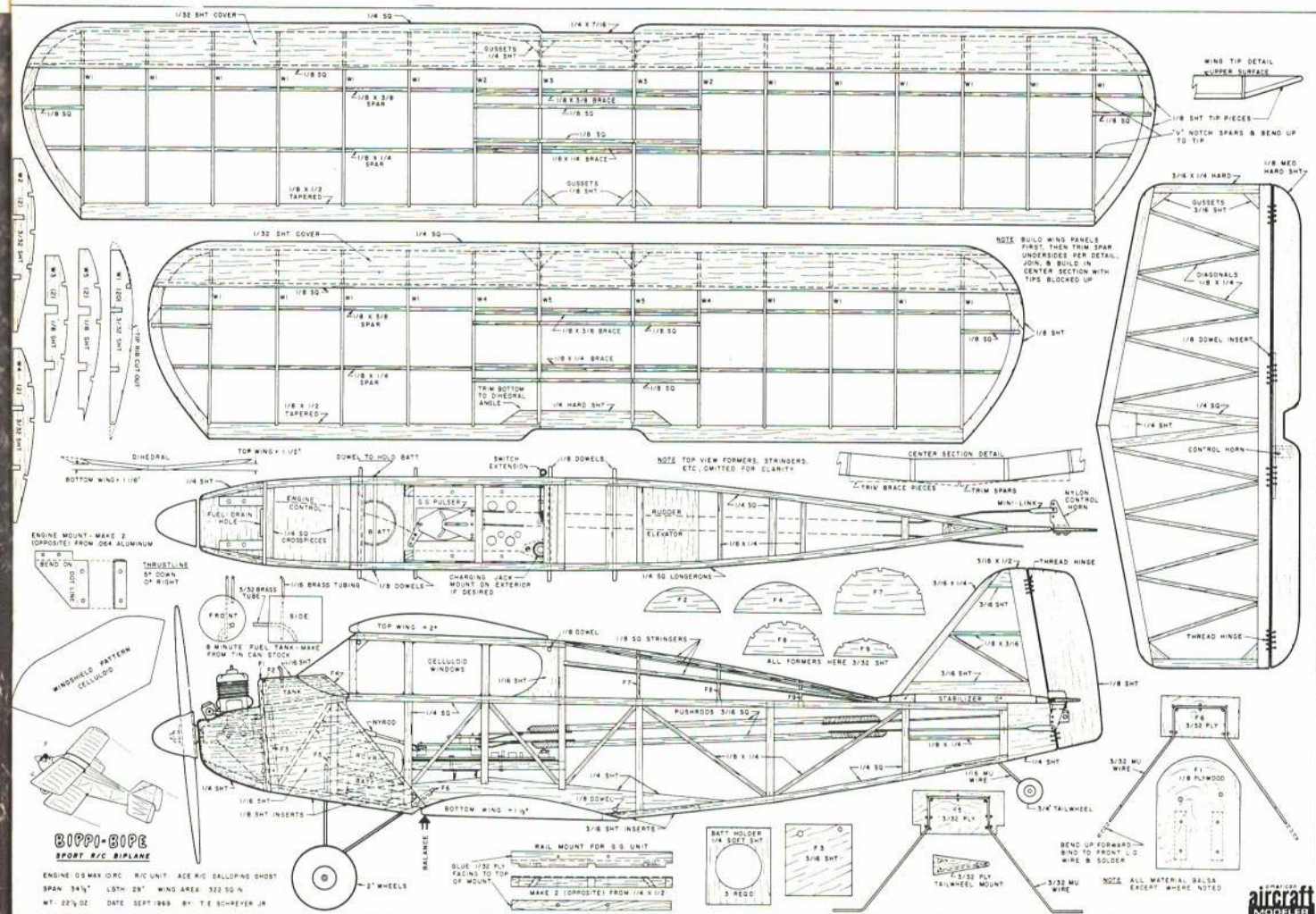
Biippi-Bipe is not recommended for the beginner, however. For one thing, trimming out a biipe is not always the easiest thing, even for experienced modelers. Since the Biipe moves pretty fast in high throttle, a beginner would invariably find himself playing catch-up with the controls—this just isn't much fun.

The plan should be studied well before beginning to do any construction work. A few revisions were made of the prototype: additional rudder and elevator area for more positive action; rounder wing tips for better efficiency and looks; battery and GG unit moved forward for balance. Not shown on plan, but an excellent idea, is the addition of a six-in. length of 1/16" dowel inserted into

Build two sides on the plan from 1/4-sq. and 1/8 x 1/4 strips including the 1/4 sheet parts around the lower wing mount area. Join the sides at the rear, and add crosspieces to form the box-type fuselage. Then add formers, firewall, plywood landing gear mounts (with wire in place), the GG mounts, battery mount, stringers, etc. Leave off the cowl covering until fuel tank and radio gear are installed.

Make two engine mounts from aluminum (or use ready-made one) and mount engine. Make fuel tank and install it, then drop radio gear into place. A third hole was drilled on the inside of the GG motor control arm to give better action, and a nylon tube-in-tube connected it to the engine throttle. Epoxy the outer nylon tube to the firewall.

(Continued on page 74)



amats

PRESENTED BY AAM'S
WHERE THE ACTION IS
GENERAL CORRESPONDENTS—
FOR THOSE WHO WEREN'T THERE

BILL BOSS
CONTROL LINE
DON LOWE
RADIO CONTROL
BOB MEUSER
FREE FLIGHT

CONTROL LINE

The 40th Annual National Model Airplane Championships was hosted by the U. S. Navy and run by the Academy of Model Aeronautics. This year's competition was held at the Glenview Naval Air Station during the week of July 26th to August 1st.

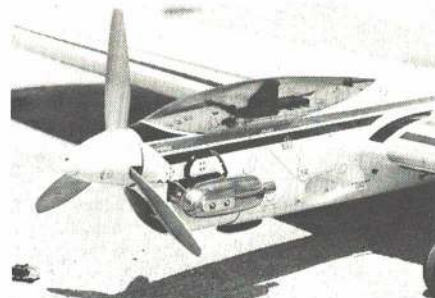
Why do more than a thousand airplane modelers from all over the USA enter each year? Well, to some it's a week that permits modeling friends to gather together to renew long-standing friendships. Whole modeling families attend this yearly competition as a vacation, living in motorized campers or tents. For many young model fliers it's the chance to rub elbows with the big names and to observe the techniques required to reach the winners' circle. For still others the Nationals can be the culmination of all their dreams, sweat and toil of perfecting models, and flying skills, in hopes of making it big by winning. And then there are those who go back home in defeat only to return again next year to try for that Nats trophy and the right to reign for a year as a National Champ.

Flying Scale was just that this year, with almost all contestants getting in an official flight. Not only have the control-line scale boys learned how to fly their ships, they have also greatly improved in the fidelity to scale and workmanship departments. The quality of planes was very high, making it a real chore for the judges. A considerable number of new models were entered. All incorporated plenty of operational features, bomb bay doors, flaps, lights, cockpit controls, super construction detail and even retractable landing gear (on Malvin Meador's winning Spitfire in the Open category). Malvin, of Suitland, Md., also won the Sterling Award of \$100 for having received the highest static score for fidelity to scale and workmanship. Cathy Burnstine, Danville, Ill., and John Glab, Chicago, Ill., were winners for the second year in a row in the Junior and Senior Categories. Cathy flew a Douglas A-26 and John a camouflaged P-51 Mustang.

The Precision Aerobatics event, more commonly known as Stunt to the competition flier, saw a large increase in the number of semiscale-type planes adding to the color and excitement of the event. However, the most conventional stunt designs with their fine detail and finish dominated the winners' circle. Bill Werwage, Cleveland, Ohio, took first in the Open Class, winning the Jim Walker Award, while Mike Jackson flew an excellent pattern to capture Senior Class for the second year in a row. Performance in both of these classes was superb among the finalists.

In the Junior Class, however, there was a marked contrast. Ralph De Palma Jr., Los Angeles, Calif., winner of the Jr. Category, did the pattern with all the professionalism of Senior and Open fliers, while Charles Retay, Parma, Ohio, did an incomplete pattern. Having been flying for only three months, Charles openly admits having had trouble doing the hourglass and four leaf clover maneuvers. However, as he remarked to me, "I go out in the circle and do what I can—that's all." Certainly this is the attitude and confidence that make future champs.

Approximately 140 contestants took part in the Combat event with 90 of them flying in



Bill Werwage's USA-1 Pacemaker, which won Open Stunt and Jim Walker trophy is S.T. 46-powered and weighs 56 oz. In best flight, he scored 470½ points.



The magnificent Spitfire by Malvin Meador took over a year to build from scratch from information gathered all over the U.S. and England. Won Open Scale. Navy photo.



Winner in Junior Scale, Cathy Burnstine checks the details on her B-26 Invader. Color scheme is of an executive transport conversion of this WW II Bomber.



Navy's photo of the Testor's teach-the-kids-to-fly program. In a hangar with these plastic ready-to-fly models, hundreds learned to fly successfully.

RADIO CONTROL

The 1971 RC Nationals leaves one with the impression of tremendous excellence in all categories of the hobby—aircraft design, equipment and proficiency of the fliers. Never have I witnessed such a high degree of skill by such a large number of fliers. The judges were undoubtedly hard pressed to pick pattern finalists out of the 109 registered Class C fliers. Similarly, in the Class C finals, it was close right down to the wire. Formula I and FAI pylon racing were in much the same vein with very fast, beautifully constructed ships and engines turning even better than last year. Would you believe 19,000 on zero nitro fuel and with a muffler for FAI? At least one flier tached that, and others were at 16,000-plus. Formula I qualifying times in the 1:30's and FAI in the 1:50's were posted.

The RC events were conducted pretty much as last year. Monday afternoon and Tuesday were devoted to pylon qualification in which the top twenty in Formula I and FAI were picked for the finals. Every flier was given three attempts to post a time in each of these events. Wednesday and Thursday were given to the Class C Pattern prelims with each flier getting seven flights, using a short pattern to qualify for the finals and to select the Class C Novice winners. Twenty Class C Expert fliers were picked for the finals flown Friday and Saturday mornings. Scale was flown on Friday and Saturday mornings as well, on a frequency time-share basis with the pattern finalists. FAI pylon finals were Friday afternoon and Formula I on Saturday afternoon. Sunday morning was given to Class A & B with each flier allowed three flights.

The weather cooperated very well with reasonably cool temperatures and not a drop of rain, although the wind was pretty high and gusty at times. The direct crosswind made it pretty difficult for the pattern fliers and tested the skill of all. It sure would be nice to fly once at the Chicago Nats with the wind right down the runway!

The pattern ship design theme this year was fast, clean and big maneuvers. So many ships were using retracts that it looked a bit strange to see the gear hanging down on some. Eighteen of the top twenty Class C Expert finalists had retracts, and every finalist airplane was a very fast, clean ship. A large number of pattern designs are approaching the mid-wing configuration, with the wing and tail right on the thrust line. There were interesting exceptions however, such as Norm Page's Mach I which was one of the most axially-rolling ships there! The Class C Expert winner, Ron Chidgey, used his Tigre Tail which appears to be a rather conventional low wing design. Don Coleman's second place Cutlass is a "high" low wing design. It's as we've been saying for some time—given a good sound model design, what makes a big difference is the flier and his familiarity with that design.

Norm Page was the top Class C qualifier but slipped to fourth in the finals, due to engine problems and a strong late surge by Ron Chidgey, Don Coleman and Jim Martin, who placed in that order. Ron, a member of our Internats Team, flew very consistently in both the prelims and finals and had the edge when it counted. This was Ron's first Nats win and there never was a more deserving guy,



Class C Expert winners are Don Coleman(l) second, Ron Chidgey(center) first, and Jim Martin(r), third place. Used Pro-Line, Webra, and own design plane respectively.



Who else? "Goldy" Goldclank with his original design plane. Yes, he did design and build it. Hold your breath, it will be an AAM feature in Goldy's own words.



Ken Drumond's B-36, same ship as flown last year. The sound of the six engines is weird. The taxi and rotation for takeoff are frighteningly realistic. Flies fast too.



Navy photo of Larry Leonard and his Miss Dara Formula I racer. He's a consistent flier—if he doesn't stop in a tree when landing. Right Jack?

FREE FLIGHT

The Nats began with two days of indoor flying at the Washington Park Armory in Chicago. In his first year in the Senior age bracket, Marty Thompson of Livermore, California (Junior Nats Champ and winner of the Hand-Launch Glider event in 1970) won the HLG event with best-two-out-of-nine flights of 62.0 and 64.2 sec., better than Rudy Kluiber's winning total in the Open age class. Marty put it all together for his last two official flights. Minutes before the event closed, he put his Sweepette right through the roof truss at the very top of the arch, posting a time that was two sec. better than the best practice flight he has ever made! Marty's fellow Oakland Cloud Duster, Jerry Geraghty, won Junior HLG—flying a straight-taper wing model in what has virtually become a Sweepette One-Design event.

Tuesday was Jim Richmond Day at the Nats, but Jim had a five o'clock date with a plane out of O'Hare, so he had to work fast. As the day's flying started, he put up his Paper Tiger for 21:37—three sec. better than last year—setting a goal for the other Paper Stick fliers that was not to be bettered. Then, breaking out his unique new FAI model, built to the recent one gram minimum weight rule, he put it up for 23 min., a great first flight, but a long way from the 30 min. it would take to beat Ron Plotzke's super-light 300-square-incher. So, Jim uncrated the old-FAI-rule model he won with last year, and after the tail pretzeled on two flights he managed to get it to hang together for 33:54 (half a minute short of last year) to win the Stick event.

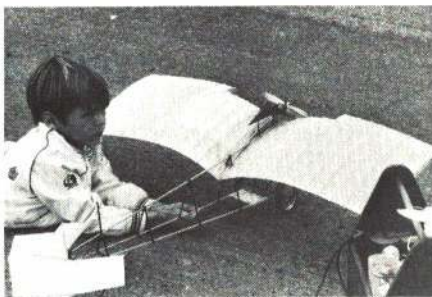
Indoor Cabin was another story. Jim started out by breaking his own record, but by the end of the day the record had passed from Richmond to Plotzke to Rohrbaugh to Rand, half a dozen times. Finally, Plotzke topped it off with 23:03. Jim again came out with the Indoor Category Championship for overall performance, but missed his five o'clock plane.

Greg Simon's helper dropped his hat on Greg's super-light 1911 Cessna, folding the wing. Under those conditions even a "mature adult" could reasonably be expected to pop his cork and spew forth copious quantities of unprintable prose—but not 11-year-old Greg. Possessing a degree of restraint his elders would do well to emulate, he had only three words—"Where's the glue?" He won Junior Flying Scale with a three-min. flight.

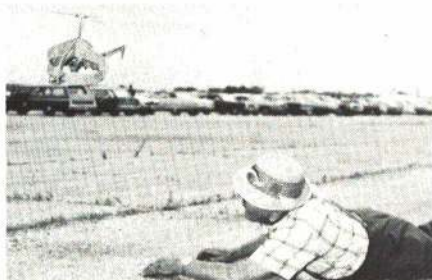
Survival was the name of the game in Outdoor Free Flight. Winds that reached 15 mph in the morning—increasing to 25 in the afternoon—blew from the West across the short dimension of the field, putting half of the max flights (those exceeding three minutes, the maximum for which credit is given) over the fence. The efficient Navy Model Recovery Crew brought back a surprisingly large number of them, but in many cases those who didn't have two models for each event were out of luck. But the weather wasn't all bad—temperatures were ten degrees below normal, rarely above the comfortable seventies, and only once getting low enough to require a jacket.

A typical Unlimited Rubber model will easily tick off six min. in still air, but intense thermal activity, signaled by spotty cumulus

CONTROL LINE



While his dad is talking, John Arthur, Jr. is anchorman for the "La Demoiselle," 020 job flown in FF Scale in spite of stiff winds. It is definitely a calm-air plane.



William Ellerman, 83, oldest Nats Contestant won the FF helicopter event. He's been a modeler "for many years" and has never missed a Nats. A Navy photograph.



Don Chancey proudly displays his recently kitted Mini-Pearl, winner of 1/2A Gas event. It is easy to build and quickly trimable. Looks small, must climb very fast.



Willard Smitz launches his Bilgri Decoy which won the Mulvihill last year and took second this year, after losing his best model. Spent three hours repairing reserve ship.

the Open class. The matches were wild with many fliers demonstrating some real skill in making the cuts and kills. During the three day combat competition there were sufficient ZAPS (mid-air collisions) and THUMPS (dives into the ground) to satisfy the destruction-hungry crowd. Once again Super Tigre engines and pen bladder fuel tanks dominated the scene—almost all used iron-on coverings.

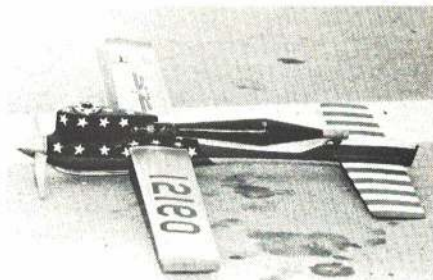
The planes, however, were another story. It seemed like all had their own designs using longer moments for better stability. Jerry Haupt, Dayton, Ohio, used a "Wedge" designed by father Jack, while Bernie Varnau, Cincinnati, Ohio, used his own design in the Open and Senior classes. Donald Morris, Euclid, Ohio, used the standard Voodoo machine to make his win in Junior.

The speed merchants were out in full force and had rumors really flying about the possible speeds that were going to be flown at this year's Nats. I heard predictions of 230 mph or thereabouts, but when the engine exhaust and dust cleared away we found that while many records fell, the speeds were only slightly higher than last year's. Danny Bartley Sr. from High Point, N. C., who established three records at last year's Nationals, put in another amazing performance by setting five new records—1/2A Proto, B Proto, B Speed, C Speed and Jet Speed. The team of Frank Garzon and Nick Arpino, Long Island, N. Y., took first in the Big C Speed event by turning 184.73 mph with a conventional ST-65 and a Mini-pipe. Myrle Hoyt, Newton, Iowa, set a new Jet Speed record of 185.49 mph, while Dennis McGraw, Memphis, Tenn., captured Jr. Jet category with 137.44 mph. Other Juniors turning in record performances were Brian Pardue, Greensboro, N. C. and Bruce Paillet, Brookville, N. Y., in the 1/2A Speed and 1/2A Profile Proto events.

If you enjoy flying in circles for 70 and 140 laps at a time, Rat and Scale Racing are the events for you. These fellows have great stamina holding onto a plane averaging approximately 120 mph (including pit stop) for 140 laps in the finals.

The pit crew action in the Open and Senior classes was outstanding. Fast refueling and quick starts were the key to some good times being turned in this year. Ed Wallace, Dayton, Ohio, turned in a time of 5:12:4 in Rat and 7:25:9 in Scale Racing to take first in both Senior events. Tim Zimmer, pit man for Wallace, was last year's Senior winner. Wallace-Zimmer certainly seems to be a winning combination. Fayette Estell, Houston, Texas placed first in Open Rat with a time of 5:24:5 about 12 seconds slower than the Seniors, while Dan Barker, San Diego, Calif., took the Junior category. Scale racing Open class was won by Frank Sanders, San Diego, Calif. Mike Waldron of Lisle, Ill., captured Junior. In the equipment department there was nothing really new. Super Tigre and K & B engines were most common, quick fuel fillers and all sorts of fuels were used and many had fuel cutoff devices.

While reviewing Carrier results, I recognized many of the winners' names, so I dug out the 1970 Nats results. Yes, the names were the same only it was a year later. Willman, Johnson, Bedard, O'Connor, Hackett, Flinn, Herron, Wright and the



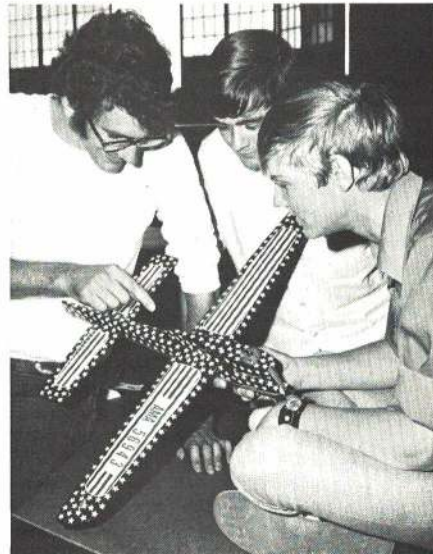
Class A speed ship by Rick Wisniewski has 2 1/2 years of flying. This year it won A and FAI speed, setting records in each class. This was Rick's first Nats. Speed is in the family.



Good launching form shown by Bill O'Connor (releasing Skyshark with K&B 40 by Charles Beverson) who placed first in Senior Class I Carrier. Note, the model is already flying!



Senior Stunt winner, Mike Jackson, was also last year's winner. Plane is modified Dick Williams Electra Wing with O.S. 35 and muffler. Has 56" span and weighs 52 oz.



Only 596 stars on rat racer by Rick Draper. Plane placed 4th last year and has flown regularly since. Beautiful finishes are not usually found in this fast racing event.

RADIO CONTROL

having been a tough competitor for years. Last year's champ, Jim Kirkland, finished fifth flying a very cute little ship called Mustang "X" powered by a Tigre 46 and equipped with Jim's own retract gears.

FAI pylon racing was conducted strictly in accordance with FAI rules including zero nitro fuel and mufflers. There was no specific noise requirement for the mufflers and a sound survey was made to help determine future requirements. Mufflers certainly made for a more pleasant sound. Based upon my own informal sound measurements on Formula I and FAI racers, however, I'm convinced that the biggest sound difference between the two was not in sound level (decibels), but in the frequency of the sound. Basically, the mufflers seem to scrub off the high irritating frequencies, but don't reduce the DB level very much. Most fliers used commercial mufflers which were just as noisy as the few home brew types that showed up.

Clearly the most impressive FAI racing design was Bob and Chuck Smith's Miss B.S., a P-51 variation. This ship was used by many of the finalists and it copped both first and second for the Telford/Violett team and Bob Smith respectively. The T/V team and Bob finished in a tie for first place which was broken in an exciting fly-off. The T/V team had a slight speed edge with their retract gear St. 40 ABC version. Probably the greatest display of determination in this event was shown by Larry Leonard. Larry unfortunately flew through a tree on landing and extensively damaged the fuse, wing and tail. Undaunted, he stuck it all back together, with the help of many extra hands and Hobbypoxy "Quick Fix" epoxy, and flew it two more heats.

Formula I interest was heightened by Bob and Chuck Smith's new Miss DARA (Dayton Air Racing Association) design. The Minnow design has dominated the event up to now and a new design increased the interest. This airplane looks very competitive, especially in the hands of Bob Smith. The Telford/Violett Miss Cosmic Wind mid-wing design also looks like a real winner—very beautiful and very fast. The eventual winner, however, proved to be the ever-popular Minnow design flown by Terry Prather, which copped highest scale handicap points and the event through the urging of a super-screaming Tigre ABC 40.

Scale saw a good battle between Maxey Hester and Bob Wischer for top honors. Maxey flew his Ryan ST and Bob contended with a Douglas M-2 mailplane biplane. Incredible detail was shown by these and most of the scale entries. Unfortunately, the high crosswind was a real handicap and was instrumental in several bashes. Dave Platt's tremendous Me-109 was a victim of the wind on the first attempt. A fabulous overnight rebuilding job gave him another crack at it, but a cranky retract gear system did him in.

Classes A & B attracted 31 and 21 entries respectively. Top Class A flyer turned out to be Chuck "Shadytrol" Shade flying (would you believe) a Phoenix 5. Chuck did a fine job after very few practice flights. Class B was taken by P. Giesekeing.

The Nats is much more than nose-to-nose competition. Surely it has plenty of that and everyone is out to win, but to me the most enjoyable part is the camaraderie, sharing of



Cliff Telford, engine expert, with Bob Violett, the pilot/builder, won in FAI and placed second in Form I. Plane is Tigre-powered mid-wing Minnow.



In RC scale, a Boeing TWA 707-320B was flown by Paul Martin. It features homemade pneumatic retracts and his own converted S.T. engines to rear intake.



Jim Kirkland used his new Mustang X, 40-powered, homemade mini retracts. Placed 5th in finals. Small plane—new trend? Patterns were small, close and crisp.



Navy photo of Raymond Gallo of the SOB's retrieving his racer which landed unharmed outside the base fence. Young helpers brought it back.

FREE FLIGHT

clouds, meant that if you caught a thermal, you maxed; if you missed a thermal, you were on the ground in two min. It wouldn't have mattered much whether you were flying a Stratolark or a Gollywock. In fact, Allnutt's winning score in Wakefield, flown earlier in only slightly more favorable conditions, exceeded the best Unlimited score. Sherman Ovelmen was one of the many martyrs, losing his model on his second max. While Unlimited produced martyrs, it also produced heroes, not the least of which was Peter Allnutt of Toronto. Peter found himself credited with five maxes but, knowing from his own watch that his fifth flight was short of a max, he refused to accept it, thereby relinquishing a good chance to take home the historic and coveted Mulvihill trophy.

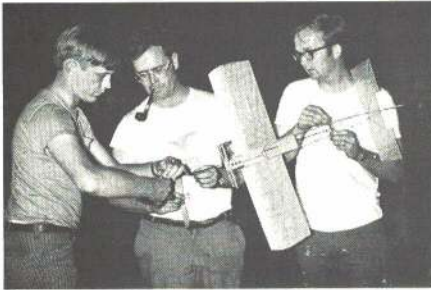
Willard Smitz, last year's Mulvihill winner, lost his big Bilgri Decoy on its third max, and smashed the fuselage and prop of his spare on an attempt at a fourth around noon. Charlie Sotich and Willard jigsaw-puzzled enough fragments to figure out how long the nose was supposed to be, and the seemingly impossible repair job began. Passers-by occasionally dropped in to hold something while the glue dried, or cut a few uprights—at times the Ad Hoc Repair Committee numbered six or seven. Willard himself could barely get a hand in edgewise. By 3:30 p.m. it looked more or less like an airplane again, albeit one built by a committee. After rebalancing, test gliding and a partially-wound test flight, it was off for another max. But, on what was to be its last max, it was blown halfway to Chicago. That's what it took to take second place! To take first, you had to have a couple of Nats Championships and a place on the FAI team under your belt, and your name had to be Bob Siffleet.

Hardy Brodersen repeated Smitz's performance in FAI Power. After losing the best of his X-cube models on the third max, he flew his reserve model in a big arc, hitting the grass at 100 mph under power, but it suffered remarkably little damage. The wing was in two pieces, but thanks to its sparless sheet-covered construction, it was epoxied together with scarcely a scar. When finally trimmed out, it helped Hardy get third place.

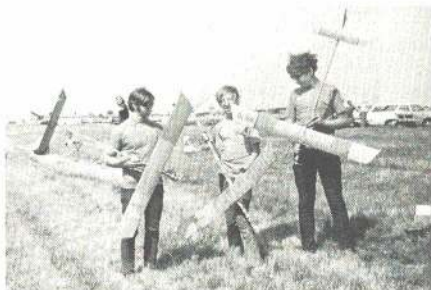
Few radical designs were seen, and those were not too successful. No new free-flight engines except the Rossi 15 have appeared in some time. Free Flight progresses by evolutionary improvements in design, construction and flying technique, seldom by revolution. Even the number of electronic thermal detectors seems to have leveled off. The entrance of M&P Enterprises into the market has provided us with more good competition-type kits than ever to choose from—even one for Jetex. But the rubber-powered model flier must still build from scratch.

In the last analysis, the free-flight competition model has to be considered expendable, and we expect to see those whose models were lost or smashed by the wind back next year to take another whack at it.

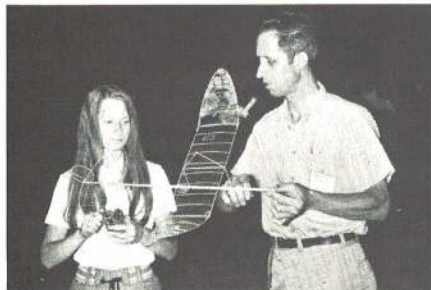
CONTROL LINE



John Thornhill and Bob Stalick help Bucky Servaites prepare 1911 Cessna for winning three-minute flight. Bucky is again Open and Grand National Champion.



Greg Fortin, 17, Doug Graham, 14, and Rich MacCleery, 17, display unusual 1/2A design. Called X-Squared, it is a Brodersen design with auto-rudder and stabilizer.



Sue Weisenbach, 19, studies Aerospace Technology at Kent State aided by an AMA scholarship. Always a Nats entrant, she is particularly active in FF events.



Rick Lachman launches his Class B gas job in the usual javelin fashion. He's been flying for four years, this was his third Nationals. Navy photo.

Sawickis dominated again this year. The only difference might have been the place won or the age category entered. The Sawickis (Richard, Robert and Marion of Wayne and Wyandotte, Mich.) took six places in the Carrier I and II events. The highest score posted in the Open events was 580.50 by Ray Willman, Normandy, Mo., in Class II flying a Grumman Guardian. Senior high score was made by Terry Herron, Wichita, Kansas, flying a Japanese Judy in Class I, while Junior high score of 446.15 was made in Class I by 9-year-old Robert Sawicki, with his French Loire Newport.

Rossi and K & B engines are still the main power plants used, and Grumman Guardians were in abundance as usual, but there were a number of other planes representing France (Late Core), Great Britain (Fairey Fulmar and Spearfish) and Japan (Judy), all of which reached the winners' circle.

Another Nats has come and gone, the circles are clear and quiet and the smell of model fuel has left the air. Now is the time for the winners to boast about "How they did it" while the losers plan for the big comeback next year. This Nats seemed to be the greatest ever, but I am sure next year's will be even bigger and better.



This Devastator is still being devastated, the crash is in progress. Note parts flying, prop is still turning and plane is in the air yet. Roland Baltes lost this round.



Do you find it hard to imagine a 14-year-old hanging on to a 137.44 mph jet? Well, Dennis McGraw did—flew at record speed but did not post a back-up flight.



Ryan S.T. Super 200 Special is prototype Sig kit. CL model weighs 9 1/2 pounds. Flown by Mike Stott. Nearly identical model was winner in RC Scale. Beautiful finishes.



First place in Sr. Combat by Bernie Varnau with his Dinosaur, at right, and second place Dave Bush with his Motivator II. Both used S.T. 35 and pen bladder tank.



The Bob Lampione design plane used by Ralph De Palma Jr. for his win in Junior Stunt. McCoy 40 and a McCoy muffler. AeroGloss finish. A confident young flier.



Danny Bartley holds his 1/2A Proto record setter which used a TD 049 (of course). He also set records in B Proto, B Speed, C Speed, and Jet Speed in Senior categories.

RADIO CONTROL

ideas and experiences and just plain bull sessions far into the night. There was no scheduled RC helicopter event but many witnessed the fine exhibition flights put on by New Jersey's Horace Hagen and Dave Gray of Dubro Products. These birds flew well and predict things to come in this category. Would you believe outside loops with a helicopter? Maybe some day!

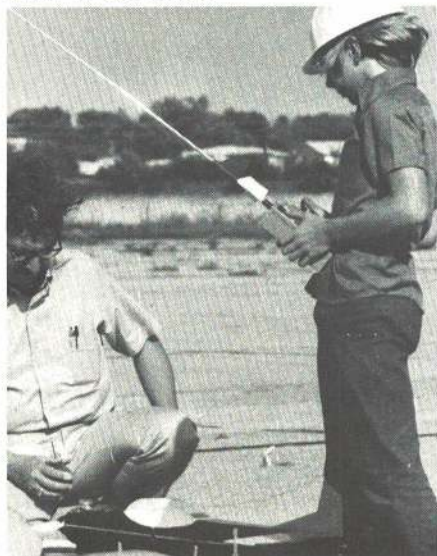
Practical retracting landing gears have surely come of age, and most people are content to put their gear down for landing, but not "Jersey" Jim Martin. His standard procedure was to make an inverted pass about a foot off the deck and put his gear up! Jim was using the new Rom-Air gear which operates very fast. In fact, he uses it to adjust his touchdown by cycling it up and down.

"Hard Luck" Jim Whitley found the only hole in the runway and messed up his nose gear, which cost him valuable points on two finals flights. Those are the breaks.

It is worth a trip to the Nats just to experience Harold "S.O.B." Goldclank's stellar performance in pattern and pylon. "Goldy" did his thing by scoring several hundred negative points in pattern by doing maneuvers in his own inimitable fashion no one has ever heard of. He also convulsed the crowd with his calling of Formula I heats—hats off to "Goldy" who has carved his own particular niche in RC modeling history.

The next time you see Jim Edwards ask him how he trims for outside loops. It seems that Jim was out practicing at one of the local club facilities when his ship stuck in down elevator while doing outside loops. It proceeded to climb while looping and flew out of sight! The next day it was found by a Navy recovery team in a small lake near Glenview several miles from the practice field! Talk about perfect trim.

And just in case anyone is interested, I suffered three flameouts in Formula I qualifications due to incredible circumstances (I goofed!)—had an FAI racer that was simply too slow and missed qualifying for Class C finals by one point.



Stu Richmond starts up a Simple Fli for his son, one of the youngest fliers at the RC Nats. Another son also flew a Simple Fli. Plane was in AAM June 71.



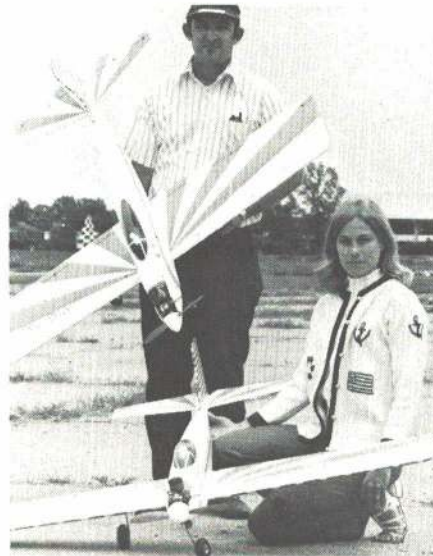
AAM's Editor flew a brand-new flaps-and-retracts-equipped Dragon Fli. Hard-working Webra pulled along a 10-lb. plane with ease. Here Sweeney checks linkages.



A trio of FAI ships leave the line in a prelim heat. While these are different, most FAI planes were various renditions of the P-51 Mustangs raced in full scale racing.



The Sons of Brooklyn are always stylish. Al Sager retrieves Phil Cushman's Class C pattern plane. The plane is a combination of surviving parts of several crashes.



Donald Sobbe, assisted by his pretty wife, entered a fine conventional design model in Class C novice. The models were the most highly decorated seen in the RC events.

FREE FLIGHT



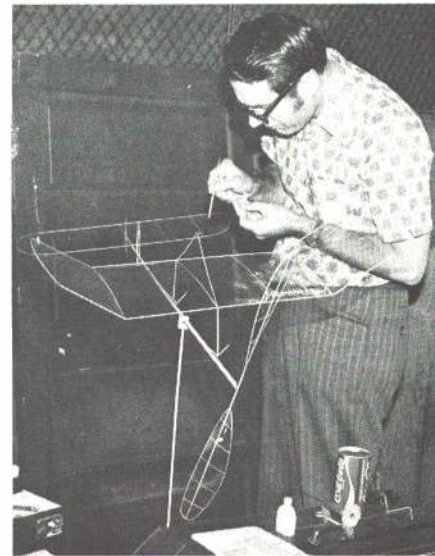
Ron Martelet of Chicago displays his rubber-powered Bristol M1-D; took second place in Outdoor Scale event for the second year in a row. A well-detailed model.



Vic Cunningham, Jr. thanks Seaman Ralph Odell of the Navy's conscientious and efficient recovery crew for return of the B-C gas Copy Cat. Was deep in the corn.



Rossi 15-powered ship by Dave Rounsaville won the FAI event. FAI models are usually conventional designs with several automatic devices. Uses electric starter.



Jim Richmond repairs his brand-new one-gram minimum FAI-class microfilm model. Note only four ribs in wing and the huge prop almost equal to wing span.

Wittman Buster

Buster is, and probably always will be, the best known of the Goodyear Racers. One of the first to appear, it won the first Goodyear Race at the Cleveland National Air Races in 1947. It went on to post an excellent winning record for many years before being retired to join the Spirit of St. Louis and the Wright Brothers' Flyer in the Smithsonian Museum. Thus it is "the" symbol of all the Formula I category racers.

Buster wasn't new when it came to Cleveland in 1947—only the name, pilot and engine were. In fact, it was probably one of the oldest planes, having first competed in 1931 and each year following (until WW II intervened) as Chief Oshgosh, with designer Steve Wittman at the controls. It had gone through many modifications over the years and was powered by at least three different engines. Many of its design features had already been put to use in production airplanes. The new name just signaled a new era with new fields to conquer.

I chose Buster to model partly as a sentimental gesture, for it spanned (as I did) both the pre- and post-WW II eras of pylon

racing, but mostly because it had the good proportions and force arrangements for easy conversion to control-line competition. Both the diesel and glow versions of the rear exhaust MVVS 2.5 cc engine had found their way into my hands and a model was needed to evaluate them.

I had used the "hollow profile" type of construction on two previous Thompson Trophy Racer models and found it sturdy enough, yet not too difficult or complex to construct. It provided a cleaner model and lighter weight in the search for a few more miles per hour. I used, and recommend using, epoxy glue and paint throughout.

Construction

The wing should be built first. (It also reaches back into history, for it is a variation of that used on Jim Walker's Fireball, the first kit of a U-Control model.) Cut the bottom sheet to shape from 6 x 3/32" sheet balsa. Mark rib and spar locations and glue the ribs in place, pinning from the bottom to follow the rib contour. Install the 1/16" spar sections between the ribs and glue on the 1/16" thick leading edge doubler. Sand the

spar tops to match the ribs and taper the trailing edge to match the upper rib contour. Glue the plywood bellcrank mount in its cutout in the bottom sheet, then install the bellcrank and leadouts. A piece of 1/8" OD brass tubing can be used as a drill for the leadout passages, after rotating a regular drill in one end until the edges are sharp. Cut the top sheet of 3/32" sheet balsa approximately to shape. Mark and cut out the 1/4 x 3/4" slot over the bellcrank pushrod hole and glue in place. Use plenty of pins, making sure that the top sheet is securely glued to all ribs and spars. Add the leading edge, tips, leadout guide tubes and tip weight, sand to shape and set aside.

Trace the right fuselage side on a sheet of hard 1/16" balsa, including the locations of all structural parts, and cut out. (The fin is a separate piece, so cut it out later.) Trace and cut out the 1/4" plywood core engine mount, wing saddle and other structural members. Pin the sheet side to a flat surface and glue the various parts into their proper locations, including the tail skid support. The bottom stringer is best made up by laminating 1/8 x



Carefully-streamlined Goodyear profile racer is a sure winner with any hot 15.

by JAMES KLOTH

1/4" strips and 1/8 x 1/4" filler pieces in the area above and aft of the wing. The left side 1/16 x 1/4" pieces are added after the control system and pushrod are installed. The engine cutout should be sized to suit the engine you plan to use. Trace around the right side assembly on another 1/16" sheet and cut out.

Next, trace and cut out the stab and elevators. The elevators should be glued to the 1/8 x 1/4" spruce spar and the 1/16 x 1/4" filler added. Sand to shape and install the elevator horn, which is bent up (as shown in the separate detail on the plan). Make a "Z" bend in one end of the 1/16" dia. pushrod wire and bend the rest to the shape shown on the plan. Insert the pushrod in its bellcrank hole through the cutout in the top sheet of the wing. Slide the wing, from left to right, through its fuselage cutout. Position it carefully and glue into place. Fill any gaps around the wing with scrap balsa. Carefully position and glue the stab into place. Fit a Du-Bro Kwik-Link to the elevator control horn and match up the other end to the pushrod. Adjust the bellcrank and elevators to a neutral setting and solder the

pushrod-Kwik-Link joint.

Now install the left side 1/16 x 1/4" strips over the pushrod and add the left fuselage side. The fin is assembled separately and shaped after gluing to the fuselage. Trace the rudder shape on to 3/8" balsa, cut out, bevel and install at the approximate angle shown. Shape to match the fuselage and fin after the glue has hardened.

Fit your engine and fuel tank and install with No. 4-40 blind nuts. Notice that the 1/16" right side sheet is cut away so that the engine and tank are mounted against the 1/4"

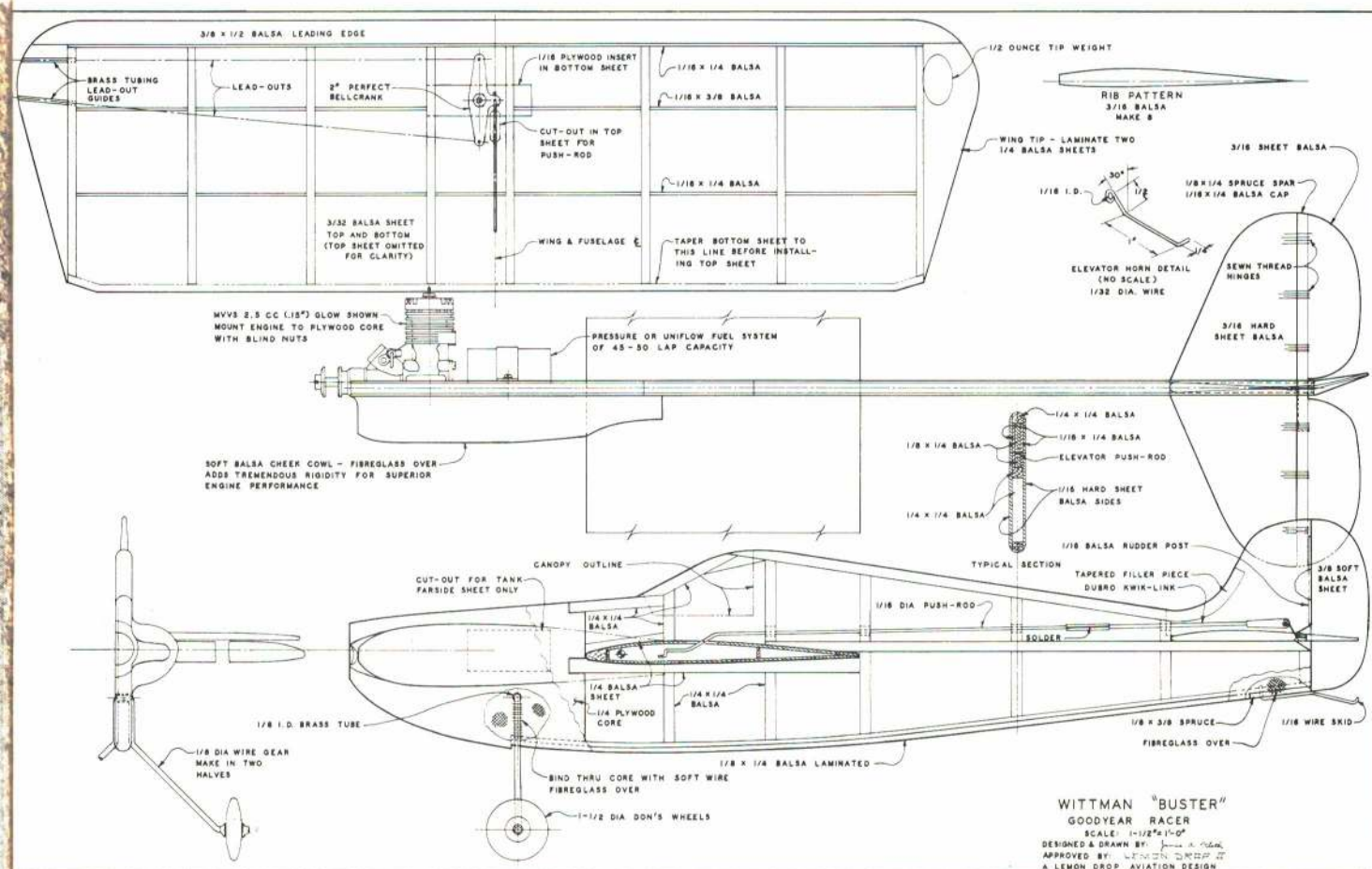
Built-up fuselage offers strength and very light weight. Even with a profile job, streamlining is essential for winning.



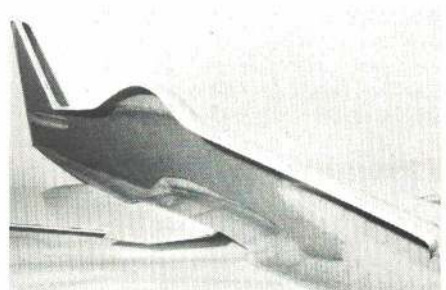
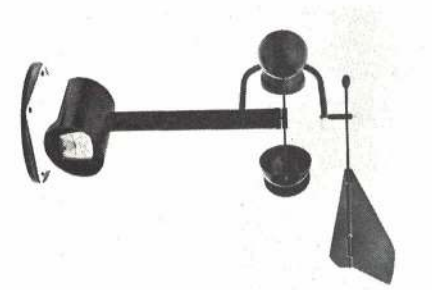
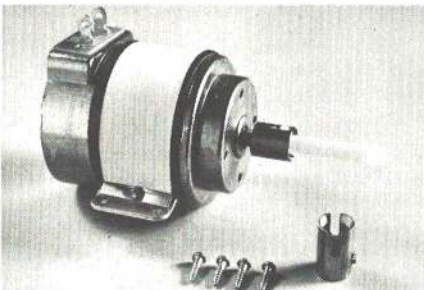
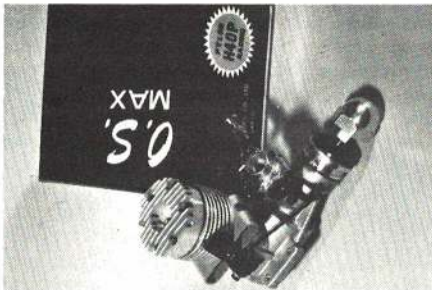
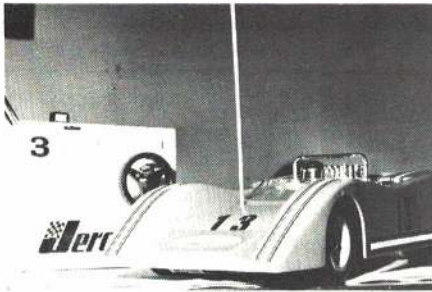
plywood core. Once the engine-tank-fuel system is established, remove and store in a plastic bag to keep out the dust and dirt.

Glue on the cheek cowl block, carve and sand to shape. Complete the shaping of the rest of the model, finishing up with No. 400 grit sand paper. Brush on two coats of Hobby epoxy Clear. Locate, drill and install the brass tube gear joiner. Bend the two landing gear halves to shape. Mount by drilling through the fuselage and wrapping soft wire around the landing gear halves, sandwiching the fuselage between. Reinforce the joint with several layers of lightweight glass cloth and epoxy. Use scraps of glass cloth to form simple fillets around the cowl-fuse, cowl-wing joints and fore and aft of the landing gear struts, so that the main layers of cloth will properly form over these junctures. Form the final fillets in these areas, and in those where the wing, stab, fin and rudder join the fuselage, with Sig Epoxilite putty. Sand the whole model again, ending up with No. 400 grit paper. Sanding can be done using wet

(Continued on page 88)



new products check list



Jerobee Industries/Comando RC Racer. Sold as complete ready-to-drive package, 1/12-scale Can-Am racer is powered by Cox 049 engine. Two-channel operation provides throttle and steering, control up to 200 ft. RC system features five interchangeable crystals on the 27 MHz band, 9V dry cell-powered equipment. License-free under-100 mw transmitter. \$109.95. Jerobee Industries, Inc., 13240 Northrup Way, Bellevue, Wash. 98005

World Engines/O.S. Max H40P engine. Equal to 50 engine in power output, H40P displaces only .397 cu. in. Recommended props, 9x8, 10x7, or 11x6, useful rpm range approximately 2500 to 15,000. Good idle, too. \$29.98. Also available with O.S. Jetstream silencer. World Engines, Inc., 8960 Rossash Ave., Cincinnati, Ohio 45236

Aero Graphics/Anemometer. Finishing touch for the flying field. All electronic self-contained anemometer-wind direction indicator measures velocities up to 40 mph. Can be hand-held or permanently mounted. No batteries or external power source required. 10" dia. rotor. Model LTH-44. \$48.45. Aero Graphics, 10954 Redrock Rd., San Diego, Calif. 92131

AMA/Shirt patch. Official 1972 FAI Control Line Team patch is now available from AMA headquarters. Approximately 2 1/2" x 3 1/2", patch sales will help to offset the costs of team travel. Also available in mylar as aircraft decoration and bumper sticker. (Sticker contains motto "Support your U.S. Aero Model Team.") Patch or pack of four aircraft decorations plus one bumper sticker, \$1. Write Academy of Model Aeronautics, 806 15th St. N.W., Washington D.C. 20005

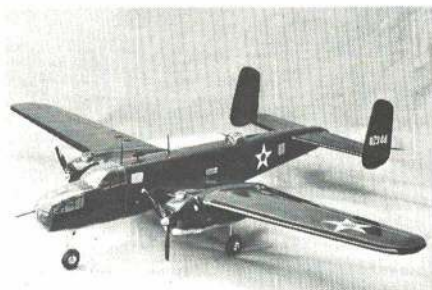
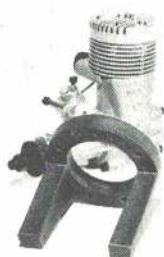
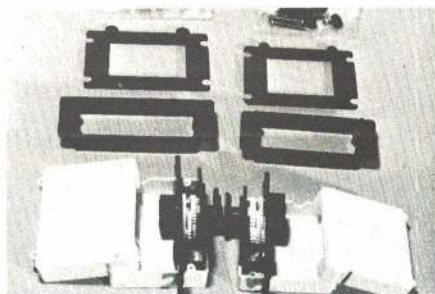
Dumas/Pittman boat motors. Recently added to wide range of boats and aircraft presently carried, Pittman motor will now bear Dumas Co. label. Advertised as the highest quality permanent magnet miniature DC motor available for this application, unit sells for \$11.95. Dumas Products, Inc., 790 S. Park Ave., Tucson, Ariz. 85716

Revell/Fokker Fivedekker. Achtung, scale-kittenenthusiasts. Der Funfdekker ben finished. Vild-looken Red Baron und his red Fokker ist off patrollen der Vestern Front. Note Doggenhouse unter der cockenpit, so vatch oudt, Snoopy! \$2.25. Revell, Inc., Box 66-397-AA, Los Angeles, Calif. 90066

Klett Plastics/Nylon bolt driver. Safe for nylon hold-down wing bolts in hard-to-reach concealed locations. Ideal accessory for the tool kit. For both binder and round-head screws, 1/4" and No. 10 sizes. 98 cents. Carl Goldberg Models Inc., 2545 W. Cermak Road, Chicago, Ill. 60608

Joy Products/Scale JN-4D. A real interest-grabber, scale kit of Jenny was created from original factory drawings. 66" span, with recommended 29 to 49 power, flying weight with all scale accessories is under six lb. With rigging and control cables, turnbuckles, etc., \$49.95. Joy Products Co., Inc., Box 374, Menominee, Mich. 49858

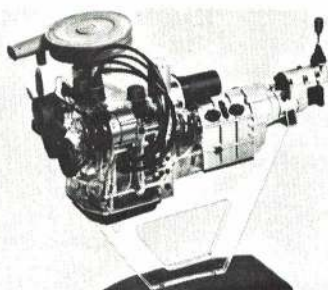
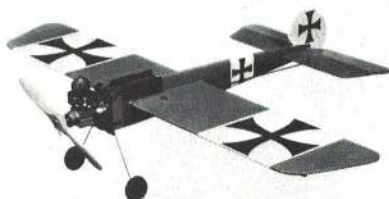
W.A.V.E. Mfg./ New technique for pylon racers. To handle stresses inherent in pylon racing, manufacturer has developed fuselage and wing fabrication using epoxy jellcote impregnated with fiberglass. Entire structure is then rigidized with nylon honeycomb for extra strength and ultra-light weight. All materials meet stringent Mil-standards and are presently used in Boeing 747 wing fabrication. Coming soon: 40-powered pylon racer in ARF kit form, priced to sell at \$90. More in coming check lists. W.A.V.E. Mfg., 1237 S. Wells Rd., Saticoy, Calif. 93303.



D & R Products/Servo mechanisms. Bantam servo now available as a replacement housing for PS-4 or KPS-12 units. More compact than earlier version, shown for comparison, servo comes with complete electronics package installation procedures. Vertical and horizontal mounting trays available. Available in quantity to equipment manufacturers. \$5.99. D & R Products, 27635 Forbes Rd., Laguna Niguel, Calif. 92677

Kraft/Engine mount. Available in 11 sizes for engines from 05 to 80, mount is constructed of Fiberfill, 30% fiberglass, 70% nylon. Advantages: 1/2 the weight of aluminum by volume, precision castings, extremely low vibration transmission from engine, screw mountings will not loosen after many hours of operation. From \$1.99 to \$3.29, depending on size and motor requirements. Kraft Systems, Inc., 450 W. California St., Vista, Calif. 92083

Royal Products/B-25. Beautifully detailed semi-scale kit of famous WW II attack bomber provides an interesting approach to twin-engine RC flying. 71" span, 54" length, recommended power is pair of 40 to 60 engines. \$69.95. Royal Products Corp., Box 22204, Denver, Colo. 80222

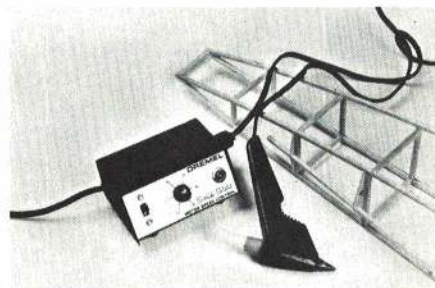


Guillow/Douglas Dauntless. Built-up balsa flying scale model of aircraft which turned the tide at the battle of Midway, kit has 31" span and can be flown free flight or U-control. Detailed plastic accessories, 3-piece sliding canopy, trapeze-type bomb release add realism. For 049 to 09 power. Truly deluxe kit for \$12. Paul K. Guillow, Inc., Box 229, Wakefield, Mass. 01880

Sterling/Beginner's UC kit. Specifically designed for young beginners, kit is easily assembled with household-type tools, uses all-balsa construction and features easy-to-read, easy-to-follow plans. Die-cut parts, metal motor mounts, control hardware (less lines and handle), decals, wheels all included. Rugged construction helps kit survive many less-than-perfect landings. For 049 engines, kits are available in six monoplane and one biplane version. Eindecker (shown) is one of the more colorful. \$2.95. Sterling Models, Belfield Ave. & Wister St., Philadelphia, Pa. 19144

Edmund Scientific/See-thru Wankel. Kit provides a chance to learn the operating principle of the no-piston, rotary-type engine, currently being used for everything from model aircraft to Japanese imported cars. Model is 1/5-scale version of current GM-licensed Wankel engine and features timed, flashing plugs, see-through plastic block, painted metal operating parts, display stand and complete instructions. 9" overall length. Powered by 1.5V dry cells. \$6.75. Edmund Scientific Co., 380 Edscorp Bldg., Barrington, N.J. 08007

by FRANK PIERCE

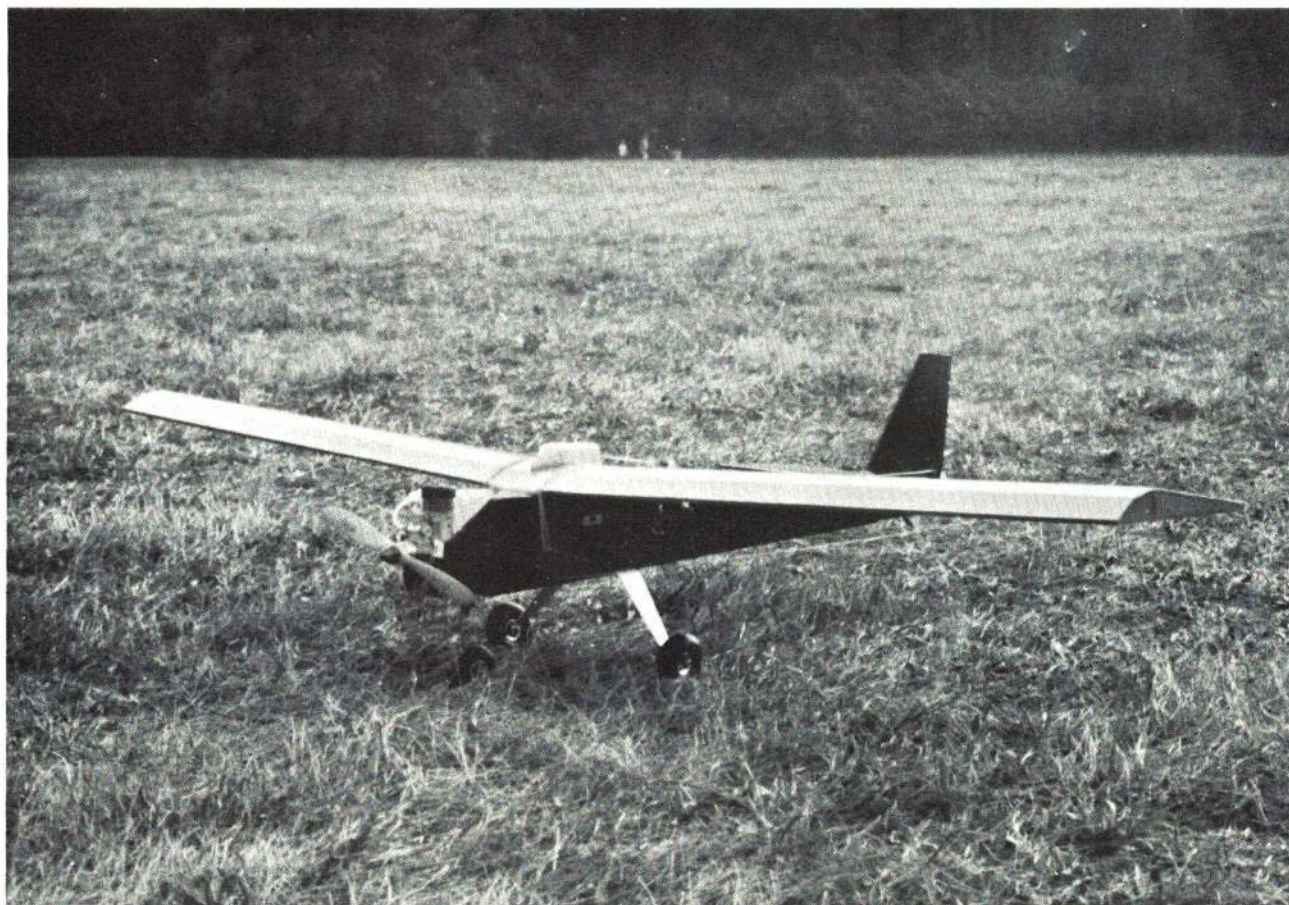


Dremel Mfg./Motor speed control; new application for. In present use as a speed control for Dremel Moto-Tool, unit also provides a useful accessory control for the new thermal-glue cartridge guns. Precise control over glue temperature is available through speed control. Prevents glue loss and dripping by keeping glue in semi-liquid state when not actually being used. \$16.95. Dremel Manufacturing Co., 4915 21st St., Racine, Wis. 53401

K & B Manufacturing/Three new fuels. Super Speed, high-performance nitro fuel designed for pylon racing; 500, designed for general RC flying and race car applications; F.A.I., formulated to same mix used in FAI competition. \$12, \$6.95, and \$4.95/gal., respectively. K & B Manufacturing, 12152 Woodruff Ave., Downey, Calif. 90241

Dennymite

by TOM ABBERGER



The Dennymite is not intended for the sophisticated or advanced scale modeler. Rather, it is for the modeler who wishes to design and build large flying models in less time and at low cost, with no sacrifice of perfection or beauty of workmanship.

My own motives for attempting the cardboard foldcraft design concept were quite personal. Every five years, my wife has presented me with a newborn son (three, plus one girl) to share the modeling hobby. My spouse continues to exhibit great tolerance in the matters of castor fumes in the basement, grass- and oil-stained trousers, piles of modeling magazines at every convenient location, and high electric bills. Modeling is our way of life.

In addition to our flying club activities, my sons have their own private flying strip behind our home outside the city limits. Their usual summertime greeting, which is music to my ears each evening, is, "Can we fly tonight, Dad?" But when the youngest child, at the

tender but aggressive age of four, demands his own flying models and equal flying time, along with the older boys, then a totally new concept for the supporting logistics of time and materials is required. Our approach led to the fold-up cardboard method of building.

By using this technique, my sons have been provided with do-it-yourself kit ideas which use corrugated cardboard sheet stock in place of balsa or plywood. The most unique feature of these aircraft is that the fuselage and/or wing is made from one piece of corrugated paper board, folded, and contains only one seam. Corners are filled in with 1/8" square balsa strip.

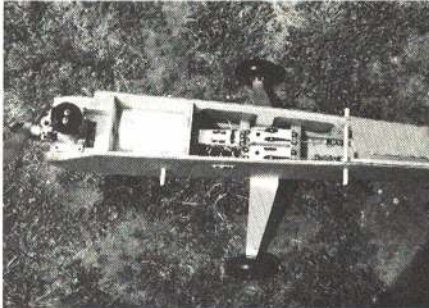
The fold-up idea has enabled us to build, in short order and at low cost per plane, many more of the slab-sided designs such as Das Little Stik or Ugly Stik, Square Shooter, Fokker D-VII, Nieuport 17, etc. Surprisingly enough, fold-up flying models constructed for the larger 45 to 60 size engines proved to have a service life equal to, or greater than,

conventionally built RC designs. Another of the many advantages of working with paper stock is its compatability with any of the glues, dopes, cements, lacquers, enamels, resins and/or covering materials which require heat in application.

The Dennymite design is intended as an example of what can be done with the one-sheet fold-up concept of construction. The technique can be applied to more sophisticated designs, with equivalent savings in time, patience and money.

Construction: This method uses a drawing the actual size of the model, which is presented as a flat layout development or drawing of the body. The intended design is laid out flat as it would appear if a completely built fuselage were unfolded. The pattern is designed in one piece so that, when the blank sheet is cut according to the layout, the cut-out piece provides the required size and shape when bent up or rolled into the finished structure.

Rugged, quick-built, sport trainer made almost entirely of corrugated cardboard. Can be built directly from these plans.



Cavernous fuselage contains any size radio/servo. Large Fox 60 used for brute power, but a 35-45 size is adequate.

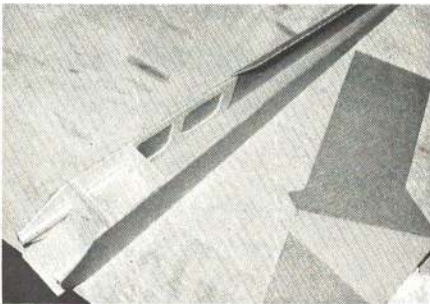


Almost finished, controls installed before gluing down the fuselage top. Note rails around aileron servo for wing alignment.

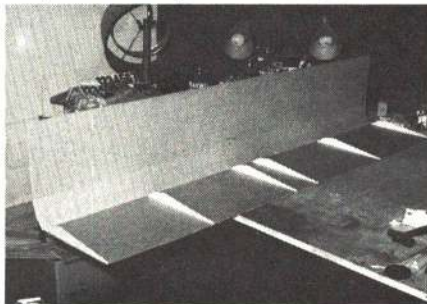


Epoxy hardwood engine rails to plywood doublers, then contact cement them to sides.

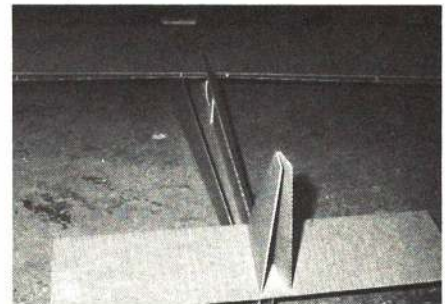
Entire fuselage made of one piece cardboard. Notice constant nose to tail taper.



Spanwise corrugations give wing its strength and permit bending for airfoil shape.



Note corrugations on stab are cordwise. Flat rudder/elevator are double thickness material.



Materials and Tools: These are indicated in the plan and photographs. Sheet stock size in length and width must meet the overall dimensions given. The working area should be a flat surface large enough to support the complete single fuselage or wing sheet stock. Drawing tools required to transfer or enlarge the design to the intended size on the sheet stock are minimal: yardstick, square or triangle, lead pencils and eraser. Cutting tools are an X-acto knife and a steel guide, such as a large carpenter's square. Good substitutes are a venetian blind slat or a standard carpenter's hand saw with handle removed. The steel guide is used to insure clean straight cuts and incisions in cardboard sheet and to avoid possible finger cuts. Keep fingers back from the cutting lines.

The Dennyrite fold-up pattern is drawn as illustrated by steps one through four. The fuselage is based upon a perfectly flat bottom and its dimensions can be enlarged to actual size starting from a bottom centerline. Actual

size dimensions for the Fox 60-powered airplane are given.

All fold-up lines are to be cut only halfway through to incision depth. On such lines, use moderate cutting pressure only. When cutting the complete fuselage outline, a clean smooth cutting stroke must be used. The steel guide must be used to insure the straight clean edges necessary for perfect alignment when folded.

Fuselage doublers can be added after the actual folding procedure, if desired. The folding will be smoother if the line to be folded (line cut halfway through) is aligned along the edge of a square-edged work table and then popped downward to make the fold.

Horizontal stabilizer and vertical fin are double thicknesses of corrugated cardboard when completed. Use contact cement if available; if not, weight must be used to hold the sandwich construction down flat until dry.

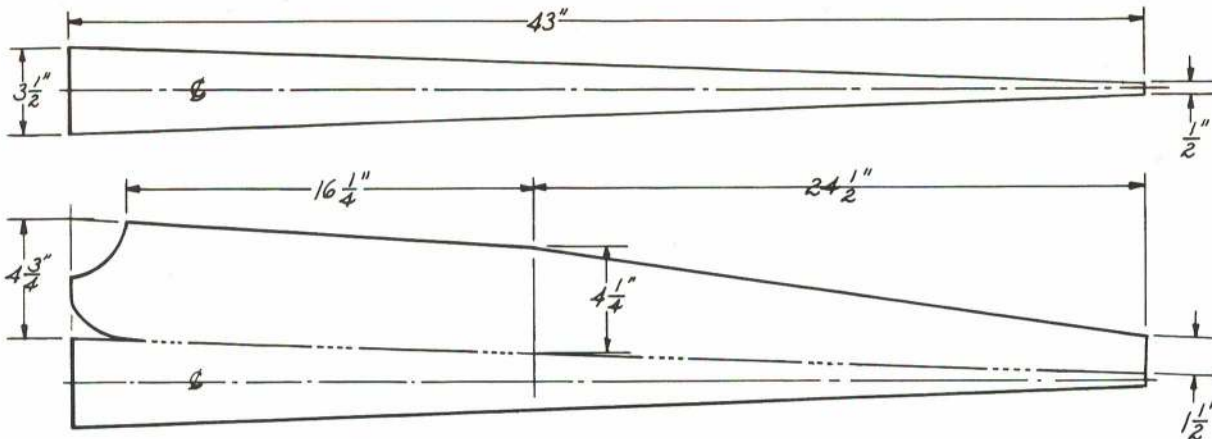
Wing construction is essentially the same

as the folded fuselage. After completion of wing cutting and initial popping procedures, position and cement wing ribs on the inside of the bottom surface, as shown by photograph and pattern. Sections of standard one-in. high yardstick material can be cemented between ribs 3 and 8 prior to gluing down the top of the wing to rib upper edges and the trailing edge.

If the wing is to be used on an aircraft without ailerons, build the wing in two halves with centerjoint ribs canted to provide two inches of dihedral at each wingtip. On either a one- or two-piece wing, apply a liberal coat of epoxy or fiberglass resin on both top and bottom sides of wing at the centerline joint and rubberband hold-down areas.

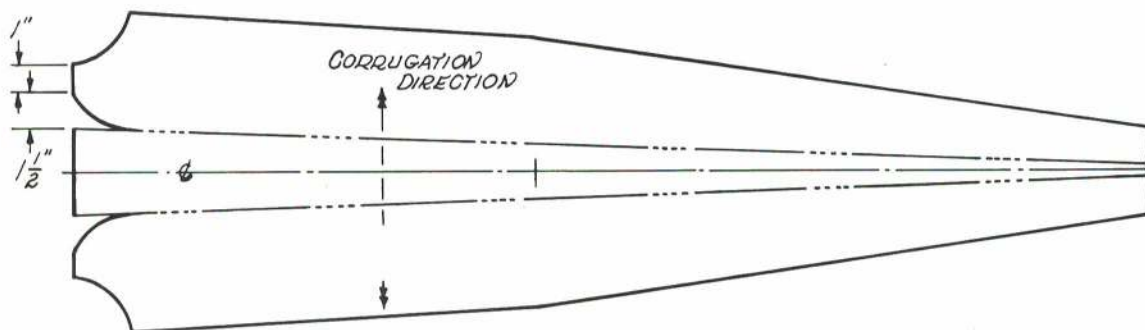
Use epoxy or fiberglass resin at the engine bearers, engine and fuel tank compartments. Use epoxy or resin at the stabilizer and vertical fin root areas on the Dennyrite design.

(Continued on page 75)

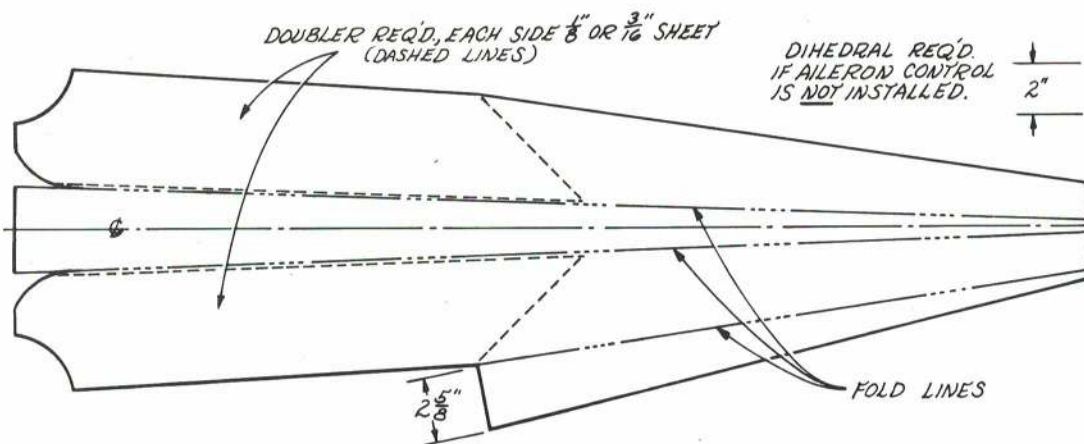


STEP 1. LAY OUT BOTTOM OF FUSELAGE AS SHOWN INSURING THAT THERE IS SUFFICIENT MATERIAL ADJACENT TO ENCOMPASS ALL STEPS THRU 4.

STEP 2. LAY OUT RIGHT FUSELAGE SIDE. NOTE ADDITIONAL DIMENSIONS IN STEP 3.



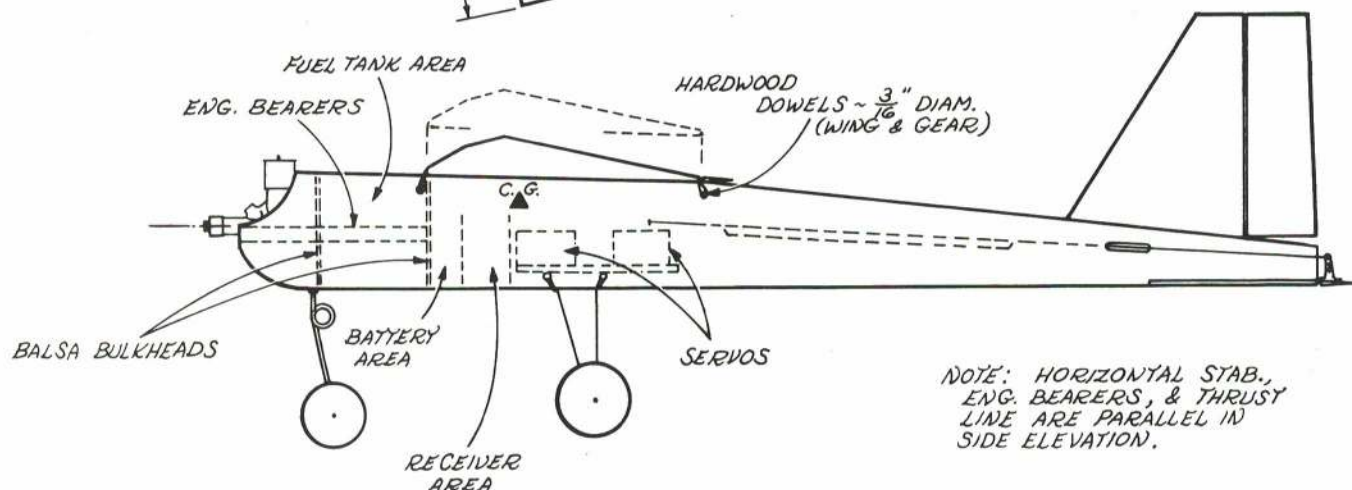
STEP 3. LAY OUT LEFT FUSELAGE SIDE.



DOUBLER REQ'D, EACH SIDE 1/8" OR 3/16" SHEET (DASHED LINES)

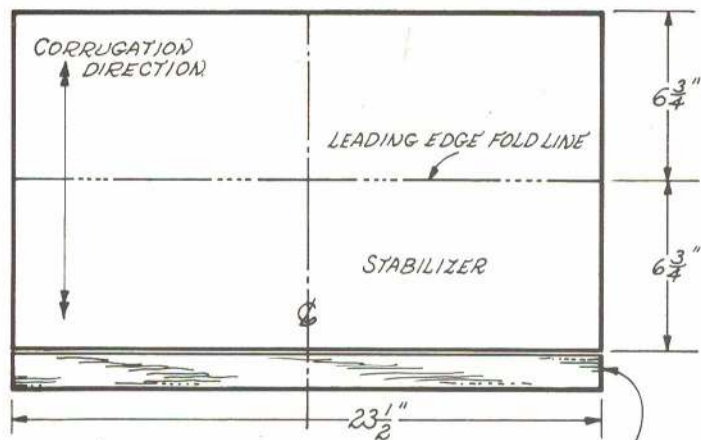
DIHEDRAL REQ'D. IF AILERON CONTROL IS NOT INSTALLED.

STEP 4. LAY OUT UPPER DECK. *FOLD LINES ARE NOW CUT (HALF WAY THRU) AND DOUBLERS ADDED.



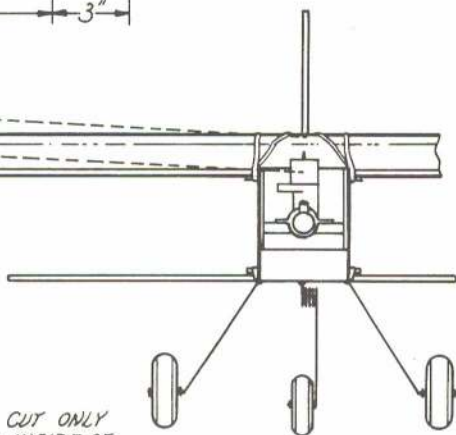
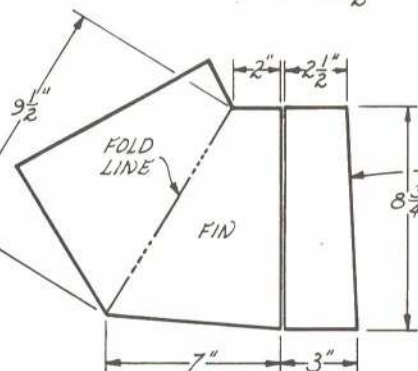
NOTE: HORIZONTAL STAB., ENG. BEARERS, & THRUST LINE ARE PARALLEL IN SIDE ELEVATION.

10 WING RIBS REQ'D.
MAT: 1/8" OR 3/16" BALSA SHEET
RIB PATTERN ~ FULL SIZE

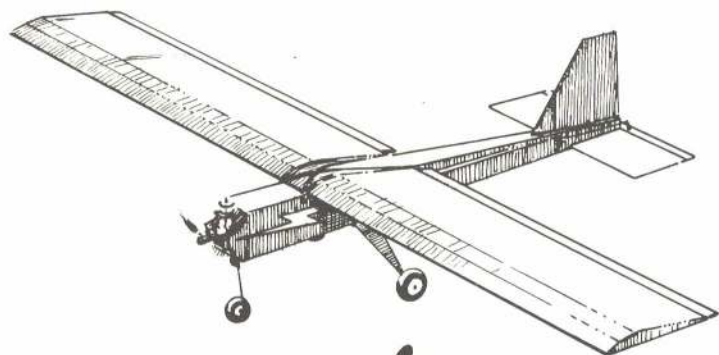


ELEVATOR ~ 1 1/2"
BALSA TRAILING
EDGE STOCK

RUDDER ~ SINGLE
SHEET OF CORRUG-
ATED CARDBOARD



ALL "FOLD LINES" ARE CUT ONLY
HALF WAY THRU ON INSIDE OF
FOLD.

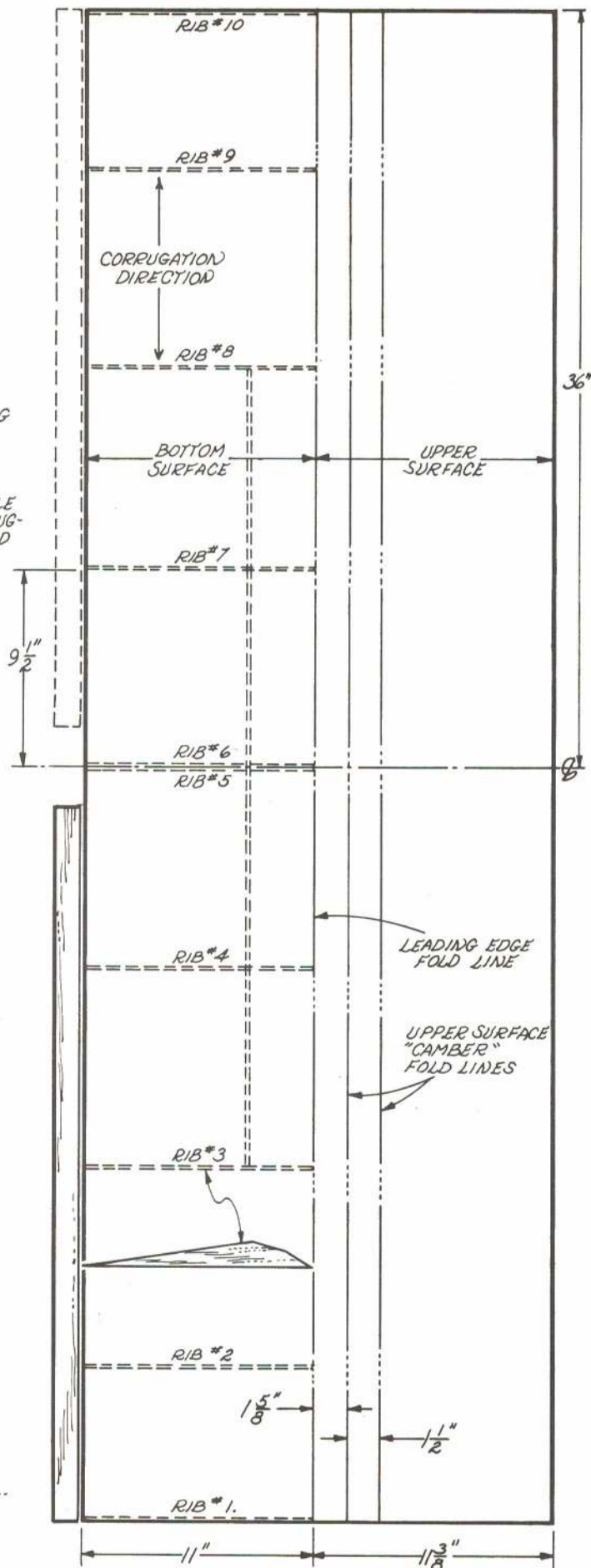


Denny Mite

A R/C FOLD CRAFT DESIGN

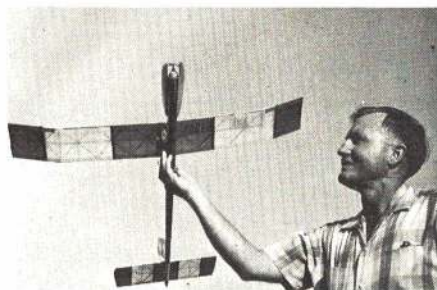
DESIGNED BY TOM ABBERGER

DRAWN BY R. ANDERSON



WING: RIBS AND SPAR SHOWN IN POSITION WITH DASHED LINES.
SPAR MAY BE CUT FROM 1" YARDSTICK.
AILERONS ~ 1 1/4" BALSA TRAILING EDGE STOCK.
2-70

Photos by Bob Meuser



The flying field—miles of flat nothing. Unfenced desert provided ten mile downwind chase area.

Even rubber-powered scale in evidence—this John Laycock's neat, simple Piper Tri-Pacer.

Harold Thomas' winner in Coupe had 165 squares of wing, 15 1/2 in. prop, 6 strands 1/4 Pirelli.

Veteran free flighter, winner of 7-ft. Sweepstakes trophy, Jim Scarborough (Broadhurst Memorial).



Only 13 years old, Jim Johnson set Jr. record, taking first in Unlimited Rubber event.

Ultimate in free flights, 56-65 powered, 1200 up in area. Winner Bill Hunter's Satellite 1300.

Parmenter's "Langley" was flown by Irwin Acker to Wake first. It had added high wing pylon.

Solid sheet wings featured this A/1 towline winner by Ed Skvarna who broke own Senior record.

BIGGEST EVER FREE- FLIGHT MEET

by BOB MEUSER

Twenty events, 100 trophies, 250 contestants from nine states, Canada, and Mexico making 600 entries, three days of perfect weather, more than a half-dozen new National records, flat, treeless desert extending downwind for ten miles—the makings for one of the greatest free-flight contests ever: The U.S. Free-Flight Championships, held in Taft, California. When the AMA announced that Nats would not return periodically to Loas Alamitos, the Norther and Southern California associations of free-flight clubs, with the aid of the Taft Condors, decided to have one of their own. Even with responsibility split a dozen ways, it went off smoothly.

Night Flying, a popular event in the West, drew eighteen entries, Dennis Bronco topped the list with a total of 27:37. At almost any time during this three hour event, at least one new "satellite" could be seen weaving its lazy, geometrically-perfect pattern through the star field. But occasionally, a hastily-contrived system of batteries, lamps and wire would fail. The DT fuse, glowing fiercely in the prop's backwash; painted the model with a soft orange light during the climb, but when the engine stopped, the desert sky was black again. Next morning, cars and cycles threaded their way through the sagebrush in search of the strayed craft.

Nordic A/2 Towline Glider was won by Dennis Bronco, one of the U.S. Nordic Team members, flying a new Sharkie (May 1971 AAM, p. 42). His teammate, Lee Polansky, dropped out early. Record-holder Kermit Walker came in second, with Tom Hutchinson third. Eddie Skvarna won the A/1 event and set a new Senior record. Thirteen-year-old Jimmie Johnson surprised the old-timers by winning Unlimited Rubber with a three-ft. stick model, and set a new Junior record (three-view appeared in October 1971 AAM).

United States FF Championships saw 250 top entrants fly 20 events in action-jammed three-day competition.

Ed Bellinger flew his Gysob (June '70 AAM, p. 38) to first in C-Gas. Walt Ghio won the FAI Power event and set a new record, followed by Annie Gieskieng of Denver, flying her old Siren.

Acker and DeWitt were top in Wakefield, but third-placer Bill Bogart set a new record. Five regular rounds were flown in the contest, so when Bill's prop jammed on his sixth flight, giving him a two-sec. flight, the game was over. But, for record purposes, seven rounds are flown, and Bill's two-sec. flight counted as an "attempt." Bill repeated his sixth flight, making a max, and finally failed to max on his eleventh flight.

Nine huge Class-D Gas models were entered—no one seeing these eight-ft. behemoths could go away with the notion that free flight involves a bunch of kids with toy airplanes. Although the 41-65 engine displacement is already included in Class-C, at least a Supertigre 56 and 1250 sq. in. of wing are needed for a true Class-D. Jim Scarborough won with his Tigre 60-powered 1400-sq. in. Texan, whose stabilizer is as large as most Class-B wings.

Out of 34 contestants in Hand Launch Glider, seven made at least three maxes, with Charles Primbs winning. Sixteen-year-old Steve Emmert put up three maxes in Rocket with his fast-climbing Jet-Texan (June 1971 AAM, p. 34). Young Fred Ginder beat out 80 others to win 1/2-A Gas with a total of 56:00—a new Senior record.

As Sweepstakes winner, Jim Scarborough received the seven-ft. tall Chuck Broadhurst Memorial Trophy. Ocie Randall was presented an AMA Distinguished Service Award for outstanding leadership from 1940 to 1970—a tribute to the third of a century Ocie has spent making Free Flight more enjoyable for the rest of us. Ocie asked "Is Free Flight dead?" Our answer is a thundering "NO!"



Annie Gieskieng gets assist in starting engine from Mr. G. She flew Siren Mk4 to FAI second.

Winding Coupe d'Hiver—My Coupe design by Nats winner Vanderbeek—is versatile Jim Scarborough.

Top man at USA Team Selection finals, Dennis Bronco. Taft winning A/2, modified Hines Sharkie.

By light of Coleman lantern, an unknown modeler starts a night-flying entry. Daytime recoveries.



Carl Goldberg's great Valkyrie flown by Sam Belcher to a first in Old Timer Unlimited.

Jetex-powered rocket event was an interesting thing. Bill Vanderbeek flew Simpson "JaTex" design.

Flying "backwards" in all events, Carl Taylor always uses canards—tail-firsters to you. This a C job.

Flying since he was three, Ken Cramsey, now 8, was flying his first gas job in his first big meet. A Sundancer.

WHERE THE ACTION IS

special interest

FRED MARKS AERO/ELECTRONICS

For Safety Sake: A candid letter from a concerned manufacturer, Granger Williams of Williams Brothers.

"We have a production problem that we are working on, concerning our 3 1/2" Spinners. This problem has become visible since the Top-Flite P-51 kit has gone on the dealers shelves. Top-Flite recommends our 3 1/2" spinner for the P-51.

"The problem is due to the weight and mass of the spinners in this large size. Centrifugal force increases with rpm. The notches cut into the back section for the propeller blades destroy the hoop strength of the rear spinner section. This permits it to spread, causing a curve in the mounting disc threaded section and forces the front cone to pop loose. No matter how tightly the front is screwed on, the centrifugal force will push it off.

"To avoid this possibility, drill 1/16" holes through the spinner front and the rear threaded section, at the area in front of the prop-blade notches. Insert self-tapping screws in the holes after tightening the front.

"The above procedure and required screws are being provided with new spinners. It is recommended that those who have already purchased the 3 1/2" spinner perform this modification.

"Over the past few months, we have been working on a new design for the screw-on-front type spinner. Included in this new design will be left-hand threads for use with starters, and a new method of construction to eliminate all possibility of the front section spinning off."

A Tip On Model Aerodynamics: I recently was honored by a visit from a college classmate, Calvin Wilson, Jr., who is manager of Aerodynamics, Structures, and Flight Test for Piper Aircraft at Lockhaven, Pennsylvania. Cal, who has been flying RC models even longer than I have, feels that our models could benefit significantly from the use of aerodynamically-balanced control surfaces. Furthermore, he feels that a "set back" hinge (see figure) should be developed. For those who would like to try it, the area forward of the hinge may be from 15 to 20 percent of total area, although any will help. Avoid making it so large that the leading edge of the surface protrudes on the opposite side when fully deflected, unless a gap seal is used or the surface is made quite thick.

I used such an arrangement several years back on the "Charger," a single-channel model flown with a magnetic actuator. The advantage of static and dynamic balance permitted the model to be flown quite snappily with a 19 in a day when magacs were limited to 049 models. Cal states that he had been flying an Aeromaster which exhibited rather poor pitch control characteristics that were readily corrected by using an aerodynamic balance.



Receiver/decoder by Mike Dorflier is self-contained in a servo for single-function operation. Uses Motorola IC on lower PC.

Friendly, Inveterate Tinkerer: Mike Dorflier writes me occasionally about one of the many projects he keeps going. He mentions a receiver, decoder, and servo-amplifier all inside a KPS-9 servomechanism! He sent along the photo shown of his receiver design which he uses to feed a single-channel decoder. As soon as Mike sends suitable component layouts, we hope to present them in this column, along with information on some of his other projects.

JOHN BURKAM HELICOPTERS

Worldwide Wrap-Up: Here is what the most successful helicopterites are doing all over the world.

Germany: Dieter Schluter, who produced and sold over 100 kits for his record-setting Hueycobra, has promoted a second international RC and full-scale helicopter competition, and is giving courses in how to fly the model choppers.

F.W. Biesterfeld is now flying the Bell UH-1D model which won second place at the RC helicopter competition in 1968.

Gustav and Heinrich Heineman have lifted a toy dump truck with their Webra 61-powered Kolibri Helicopter.

Netherlands: A. Van der Velden flies his super detailed HP-61 powered Bell UH-1D in a hangar—weighs ten lbs. and has six-ft. rotor.

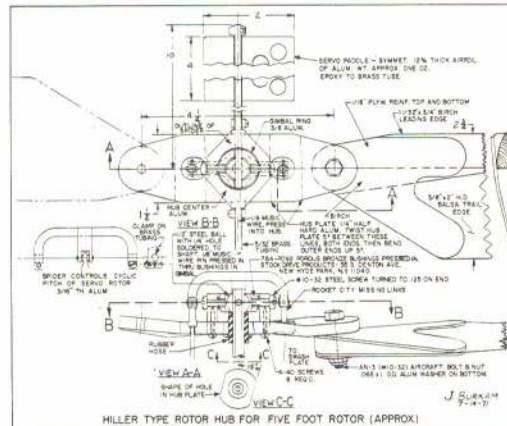
Japan: Shinya Fujiyama uses three-bladed rigid rotor and gyro stabilizer on his water-cooled Enya 60-III powered copter. Pictures of this and Van der Velden's model in June 1971 **Radio Control Models and Electronics**.

USA: Dave Gray probably is the first in this country to achieve full control with his five-ft O.S. 40-powered torque reaction drive model. Only three-min. tank on ft, but an ultra-simple model to build and fly.

Horace Hagen accumulated about 90 min. of tethered flying on his Schluter-kitted Hueycobra. Then that super-flier took off the tether lines and flew it around the field, coming to a hover before landing! He was already a skilled RC airplane pilot.

My own five-ft., rigid rotor chopper has seven hrs. flight time and has made several circuits of the field.

Of the eight helicopters mentioned, six are powered by 60 size engines and weigh close to ten lb. They can carry only a pound or so of fuel and stay within the FAI weight limit of two kg. for world records. Their duration is thus limited to about half an hour. Better to use half as big an engine, carry twice as much fuel, and fly four times as long.



Three of the eight used the Hiller servo rotor control system. (See sketch.) Two used the Bell Stabilizing bar, two have hingeless rotors and control gyros, and one uses tip weights. Not only is the Hiller system the simplest and most stable system, it puts the least load on the servos, which only have to control the angle of the little servo paddles. Those in turn control the angle of the main rotor blades. The Bell rotor is stable, but is more complicated to build. The Lockheed control gyro and hingeless rotor is stable in hovering, but does not have good speed stability in forward flight at present.

CLIFF PETERS RC BOATING

Electric Boats Moving Faster: With the availability of water-cooled electric boat motors of greater horsepower, lighter weight and increased efficiencies of up to 80%, speeds of electric boats are increasing into the IC engine class.



Would you believe, an electric boat! Only a few years ago such speed for a large electric boat was impossible. Text tells about the developments. Maybe a record?

The SeaWasp II, shown in the photos, is an excellent example. Though not designed as a racing craft, it is much livelier than most scale cruiser-type hulls and is indicative of things to come. Two 12V SeaWasp motors power a Norco model cruiser. Motors are geared down 1 1/2 to 1, to drive a single Dumas P-50 prop. While several different size NiCads are being tried, the ones used when these photos were taken are 6-amp Sonotones with a times 15 draw capability. Smaller capacity cells of lesser weight would show a speed increase but shorter running time.

Flank speed running time is approximately eight min. Two speed plus "stop" are available by inserting a one ohm, 200-watt resistor into the circuit which serves two purposes. It allows a slower running speed when desired, but more important, it becomes a current-limiting resistor and thus makes possible the use of a much smaller switch than would be possible if the switch were required to take the large sudden "make" spark. A small two-deck wafer switch, each of two-pole, four positions, with the poles, and each set of contacts connected respectively in parallel, results in a single pole, four-position switch which does not show undue contact sparking or burning.

A "shorting" type wafer switch must be used so that there is not an "open" when the contacts move from the "slow" position to the full-speed one. Remove the detent ball, or the servo will not be capable of moving the switch contacts.

The resistor has a disadvantage in that it dissipates power in the form of heat. This power loss is waste, but it is mighty handy when maneuvering and when attempting to bring the boat in to shore slowly, rather than catching it on the fly at high speed.

Even though there is some power waste, the overall current in the circuit is greatly reduced, thus running time on a given set of cells is increased. The builder may have other ideas he feels more suitable for obtaining the same result without as much power loss, but it finally becomes a matter of cash expenditure and weight. The resistor is comparatively light, which is desirable whether the hull is racing designed or made for the pure pleasure of sailing.

What has been your experience with electric boats? Got any circuits for speed control and reversal which may be unique? Ideas are welcome in this new column. Address your materials to Cliff Peters, c/o AAM. For items used, small payment is made. Credit is given to all sources.

LARRY ROBBINS RC CAR RACING

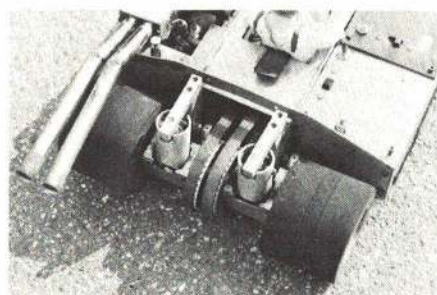
ROAR Nationals: The 1971 ROAR Nationals are now history with John Thorpe crowned as National Champion. Racing this year on the large road course was fast and furious with fantastic speeds obtained on the long back stretch. The surface was so good and has so much bite that it was probably one of the best surfaces most of the drivers had ever driven on. California drivers were the fastest but the drivers from the East and Midwest were better in crowded turns and traffic situations—probably due to the larger, more wide-open tracks used in the West, and the shorter and generally tighter Eastern tracks.

National Tech Notes: Servo protection for the steering servo was very much in evidence and appears to be the way to go. No one type dominated the picture as they ranged from simple spring types to complicated cam affairs.

Fuel systems have also been getting a lot of attention with pressure-type setups coming into wider use. Most of these appeared to work on the exhaust system for pressure and not on crankcase pressure, as in airplanes. The reason being that cars must have throttle control. Crankcase-type pressure is too great and would have to have a complicated pressure bleed-off system. Kavan carburetors were utilized on the Veco engines, with some of the larger Perry carbs also being used.

Of great surprise was the almost complete lack of independent rear suspension setups. With all the talk this past year about how this is the only way to go, it was a disappointment not to have seen more. To the best of my knowledge, not one bevel gear-type drive with universals and suspension arms raced. There were several belt-type arrangements ranging from sprung live axles to Gary Walker's independent dual belt rear with air shocks.

Front suspension ran the entire gamut—from completely solid to independent—but nothing really new was seen. There seem to have been a few engine improvements made however. Some of the Veco 19's were obviously reworked as no stock engine ever put out—in power or rpm—as some of these did. Maybe we can persuade someone to share their hop-up secrets on the Veco 19 with us in a future column.



Gary Walker's car—dual belt independent rear suspension with air shocks.



Correspondent Robbins and Gary Walker track marking at Series '71 East Contest. Needed items: broom, tape and two willing people.

Newsletters: Received a copy of the "Slam Sheet" newsletter of the St. Louis RC Car Club—a going club with regular racing activities planned for both the amateur and expert driver. If you live in the St. Louis area and wish to join the club contact Ken Campbell, President, 4363 Selwyn Lane, Bridgeton, Mo. 63044. To club newsletter editors out there: How about putting this column on your regular mailing list so that everybody can share in your goings on?

DEANS RADIO FOR BOATS/CARS

OPERATING THE DUMAS FIBERGLASS SKDADDLE 20

W. S. "Bill" Deans has been in the RC business in one way or another for many years. My first recollection was of his reed banks and relays for numerous reed systems. (Yes, there were many types of systems before digital!!) Deans manufactured the best eight-pin plugs made for reed systems, where there was a wire for each pin; 0V, 1.2V, 3.6V, and 6.0 volts, signal left and signal right. We have made progress. Bill now manufactures the same fine plugs in the four-pin configuration needed for digital proportional with the added feature of gold plating the pins. I have to admit, those old, unplated ones did gall over a period of time.

Deans also manufactured reed systems up to ten channels. He later became one of the early digital manufacturers with a very successful set. During the recent rounds of miniaturization, Deans ceased manufacture of

the old set with its large servos and, over the past year or so, has proceeded to develop the fine miniaturized set reviewed.

This set is unique in that it is designed specifically for car and boat modelers, which is readily apparent in the transmitter layout. The primary control is a large "wheel" knob. Steering trim is located immediately below the wheel. In operation, the transmitter is cradled in the left hand so that the fingers of that hand control: (a) a "deadman" throttle, (b) the throttle trim, (c) the auxiliary channel lever normally used to shift gears on cars and, (d) mixture. The "deadman" throttle is spring-loaded to one end, normally idle, and is held open with the throttle control finger—quite precise for boat or car operation.

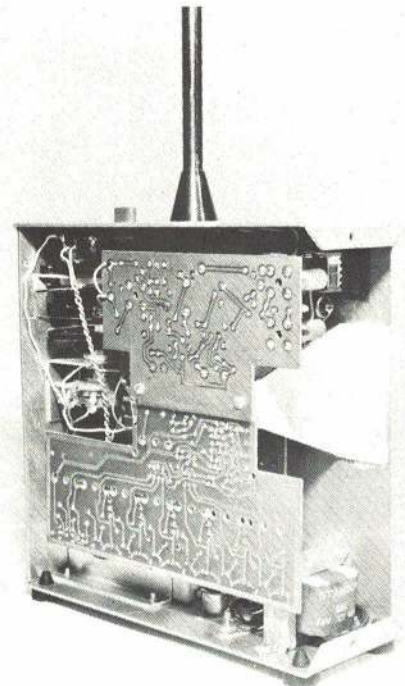
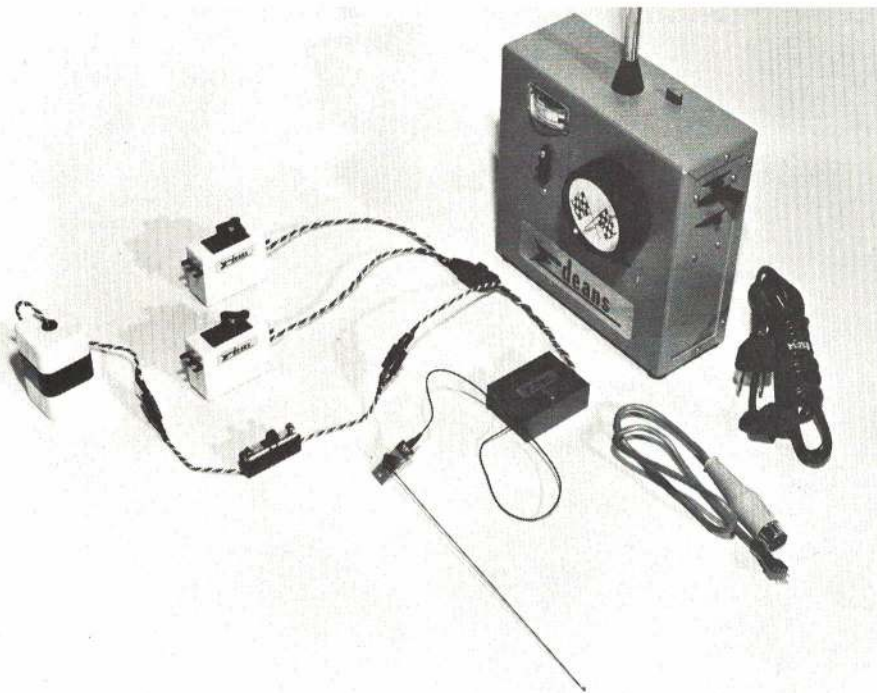
The transmitter is housed in an aqua-colored vinyl case 6 x 6 x 2 1/4 in. A meter is provided for RF output indication.



by FRED MARKS

An unusual interlocking antenna fitting is used which has a square shoulder protruding through a square hole in the case and mating with a square hole in the interior piece. Thus, the antenna and ground leads cannot be twisted and kinked when tightening the antenna fitting. A base-loaded, five-section antenna 56 3/4-in. long is used which can be collapsed to 13 in. The last physical feature is probably the most unique: protruding from the top of the transmitter, just to the right of the antenna, is a changeable crystal.

(Continued on page 91)



Of note here are transmitter layout and receiver's antenna system. Both are unique because of car or boat applications.

Text describes the transmitter's good internal features. Transformer in charging system for shock protection.

Compact receiver with changeable crystals. Antenna is actually center-loaded.

New Dick Rehling-designed servos offer lots of internal space for the amplifier and operation with case halves removed. Dual rack output also available from servo maker.





CARL GOLDBERG

NEW!

FOR 1971

Unique SNAP-LINK!

Patent Pending



Now for the first time — you can buy a truly safe link — the SNAP-Link! Note these features:

- Tiny 45° shoulder snaps through arm, prevents accidental opening. So unique it's Patent Pending!
- One-piece design — no separate pieces that might come apart.
- Proven tough nylon molding — takes tremendous stress, prevents metal electrical noise.
- Self-friction fit on threads — no need of a nut to prevent change of adjustment or vibration wear on threads.

Snap-Link, Regular, with rod } . . . 29¢ each
Mini-Snap-Link, with rod }
Snap-Link or Mini-Snap, less rod . . . 2 for 40¢

From now on you can forget those little nagging link worries. When you want a SAFE link . . . ask for SNAP-LINK!



And More NEW ACCESSORIES . . .

STEERABLE NOSE GEAR

Versatile — steering arm can be to either side, or slightly up or down, or mounted on bottom with extra collar in slot. Steering arm is nylon, stiff enough for good control, yet can flex under shock to protect servo. Collar is hardened steel — won't strip like brass. Screw is hardened steel, too. You can really torque it and get good grip on music wire strut without a flat. Try it, you won't get it to strip out easily.

Complete steerable nose gear, with nylon bearing, 5/32" plated music wire strut, extra collar, blind nuts, screws and washers — \$2.50.

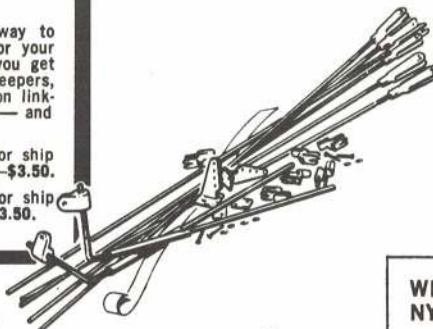


NEW—MAJOR R/C FITTINGS SETS

Here's the economical way to buy the major fittings for your multi ship. In one set, you get all the horns, links, keepers, bellcranks, or strip aileron linkage, and hinge material — and at a saving.

R/C Fittings Set No. 1 for ship with standard ailerons — \$3.50.

R/C Fittings Set No. 2 for ship with strip ailerons — \$3.50.



STRIP AILERON LINKAGE

This complete set has two threaded aileron horns; two nylon brackets for fine, safe (can't slip) adjustment; brass bushings; Snap-Links and rods, and Snap'R Keepers. Exceptional value — \$1.50



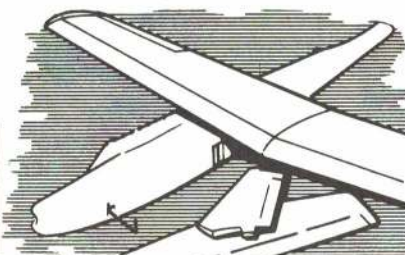
NYLON STEERING ARM

Hardened steel collar and screw — 75¢



REPLACEMENT FOAM WINGS, ETC.

To go with your own design fuselage. Proven efficient Ranger 42 foam wing gets you in the air quickly, \$3.95. Stab and vertical fin, set \$1.95. Assembled Ranger 42 fuselage, plus bearers, nosegear, etc., \$8.95.



Available in Canada

CONTROL HORNS

Our new horns have the upright part rising from the center of the base for maximum stability. Holes are right size for 1/16" wire; nut plate for simplest mounting. Long horns or short horns, with screws — 50¢ for 2.



WIDE NYLON TAPE

This nylon reinforcing tape is extremely tough when applied with epoxy around the center when joining wing halves. 2 1/2" wide x 5 ft. — 50¢



NYLON BEARING

One-piece design mounts to firewall without alignment problems. Includes blind nuts, screws and washers — 75¢



1/2A BELLCRANK and HORN

Made of nylon, this new set provides smooth 1/2A control line operation. Easy on dacron lines, too. 25¢.



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I am sending 20¢ for 8 pg. Illustrated Catalog with "Recommendations in Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

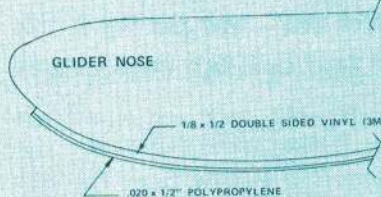
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GLIDER SUPER SKID

We've packaged up 4 ft. of 1/8 x 1/2 double sided vinyl tape (3M) and .020 x 1/2 polypropylene which when applied to the nose of your glider makes an attractive, quick, and indestructible skid that absorbs shock and protects the plane's belly from hard surfaces. There's enough for two or more gliders.

No. 25L14—Glider Super Skid \$1.50

NEW SIZE FOAM SEATING TAPE

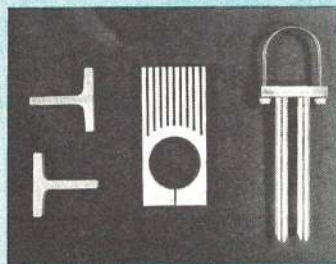
We've had requests for a single sided seating tape in a different size than the other two we now have. This is top grade closed cell vinyl made for us by 3M (As are our other seating and double coated tapes) and is the best to be had. Measures 1/8" thick, 1/4" wide. (Our other tape is 1/16" thick.)

No. 36L142—1/8 x 1/4 Vinyl Seating Tape .65 36"

CLEAR RTV 732 SILASTIC

We have been carrying this in the white, but keep getting requests for the clear or translucent for use in sealing cowls to fuselages and other places where non-visibility is important. Same characteristics as the white—moisture resistant and heat stable. Tack free in less than 1 hour. 3 oz.

No. 24K7—CLEAR Silastic, 3 oz. \$2.40



KRD ALUMINUM T MOTOR MOUNTS

Here are some machined aluminum motor mounts which will fit .049 to .19 motors. These are undrilled or untapped so that they may be universally fit. They may be shortened if required.

Being in two pieces these will fit the width of the beam of any motor in this size category.

No. 16L352—.049-.19 Motor Mounts Pr. \$1.00

KRD HEAT SINK FOR VECO .19

Here is a needed accessory for race car fans. This heat sink does an exceptional job. Is completely chrome plated, and will keep its neat appearance. Built to withstand usage and to do the job effectively. Designed for the Veco .19 race car engine only.

No. 39L1—KRD Veco .19 Heat Sink \$4.50

KRD EXHAUST PIPES FOR VECO .19

Complete with rotor hole plugs, these twin pipes lend a nice appearance and add to the performance of the Veco .19. Chrome plated and designed to fit and work properly.

No. 39L2—KRD Veco .19 Exhaust Pipe \$5.98



Dear Friend:

The voice at the other end sounded urgent and breathless. I had just picked up the phone in response to the intercom. "Mr. Runge?" Cautiously, I replied "Yes." The next words were garbled—all I could tell is that the call was coming from somewhere in Massachusetts. "I have been trying R/C flying for 10 years. I just had to call you and let you know that with a Dick's Dream I built from your kit and the Commander Baby, I have had my first successful flying session!"

What a nice way to start the day. But then, it's not an unusual way around here. Besides phone calls, we get letters. Some like this: "Your service is excellent, your Pulse equipment is terrific!" or this: "I do all my buying at my hobby shop, but I had to let you know your equipment is just great. Thanks for what you've done to make a good hobby really enjoyable!"

We could go on like this for quite a while, but that isn't really what this column is all about. But we did want to share with you the growing excitement that is being felt in the land about single channel pulse. Stew Vance, editor of the DC RC Newsletter, devoted an entire page of that publication to comments about what fun R/O is, suggesting to any of his readers that magic prescription for "Lost Fun Troubles", a dose of "nearly faultless and inexpensive pulse rudder with good old magnetic actuators."

We've been conducting a survey with the Commander Pulse units we send out. With each is a warranty sheet and we ask background questions to give us an idea of who our customer is. The returns of these warranty sheets has been exceptionally high—and the results most interesting:

48% of our Rudder Only customers are between 21 and 39 years old; while 33% are over 40.

10% have been in modeling less than a year, but the balance say they have been in longer—here is an eyepopper: 30% say 21 years or more!

38% of our pulse users are beginners; but 55% have been in R/C three or more years. Of this 55%:

58% own two or more other radio systems including digital outfits; 10% have 4 or more complete outfits!

Those figures are quite revealing. From that 38% beginner group, we have many who tell of success on their first attempt. And the airplane? More often than not—the Dick's Dream kit.

To wind things up—our foam wings are going great guns in a wide variety of applications. We've shown you several in months past. This month here is John Chapis of Denton, Md. with a Profile P38! Really looks sharp in the air. Our grapevine tells us that AAM will be publishing plans for this one.

Keep watching our ads—we've got some good things on the front burners, and we're turning up the heat!

Keep 'em pulsing,

Paul F. Runge



ACE HIGH SAILPLANE KIT

Kampen Designed--
For Rudder Only Pulse

The Ace High kit features a matched set of foam wings. The constant chord section forms the center, and the taper section forms the outer panels for a graceful, easy to build, strong but flexible, high aspect ratio, wing. This method of construction overcomes the biggest single stumbling block for the beginner to the fine art of soaring. The polyhedral span is 70".

Fuselage and tail assembly is straight forward construction. Balsa and plywood is precision band sawed, and dimension sanded of the highest quality wood available.

Parts for power pod are included (Cox Babe Bee .049 recommended). Those living in the soaring areas of the country can leave off the power pod and locate hooks for high start or tow line launch.

The kit also contains step by step assembly details, matched foam wing sections, hinge material, torque rod and link parts, nylon tubing, and installation hardware for Rudder-Only Pulse Commander. (Standard Commander 10G16 recommended).

Extensively test flown for well over two years.

No. 13L104—Ace High Sailplane Kit \$14.75



DICK'S DREAM PLANE KIT

For the Beginner or Expert!
(Designed especially for pulse)

This kit of the Dick's Dream, designed by Owen Kampen, has been extensively test flown in various parts of the country. It has several innovations which are for the small breed of airplane specifically, and with the foam wing the beginner is assured of overcoming a big drawback to success. Features crutch type fuselage construction to assure line-up and accuracy.

Full step by step instructions to assist in building this gem of a kit. AND ultra simple installation shown for the Commander R/O Baby or Baby Twin!

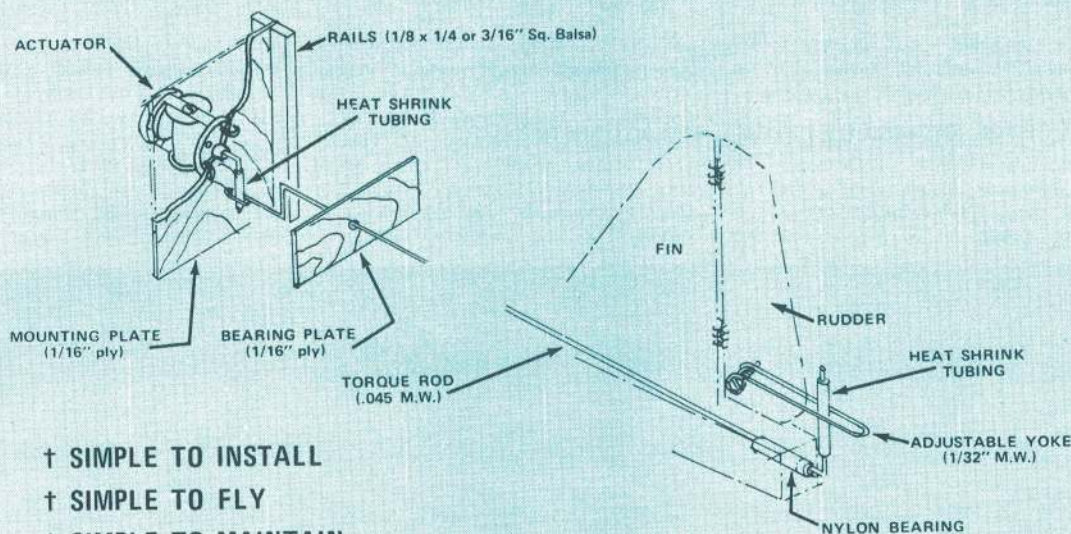
Span is 34" (cut from the Ace taper wing foam sections), 5 1/2" chord, length is 25 inches. Weight with R/C gear is 12 to 14 ounces.

With a Pee Wee .020 and a Commander R/O Baby you have a docile performer and excellent trainer. If you want something hot, Tee Dee .020 with the Commander R/O Baby Twin will do the job—it'll do everything in the Rudder Only book!

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JUST FOR FUN!

THE SIMPLE SYSTEM--



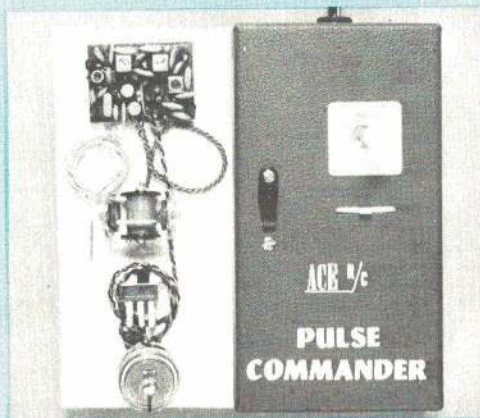
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Our NEW Handbook Catalog has been completely revised to make it easier to locate items you are looking for. More items on less pages, to save you time. Also contains complete info on what makes Pu's Rudder Only work--and why it is your best bet. Price is just \$1.00 via THIRD CLASS MAIL. Refundable on your first order of over \$5.00.

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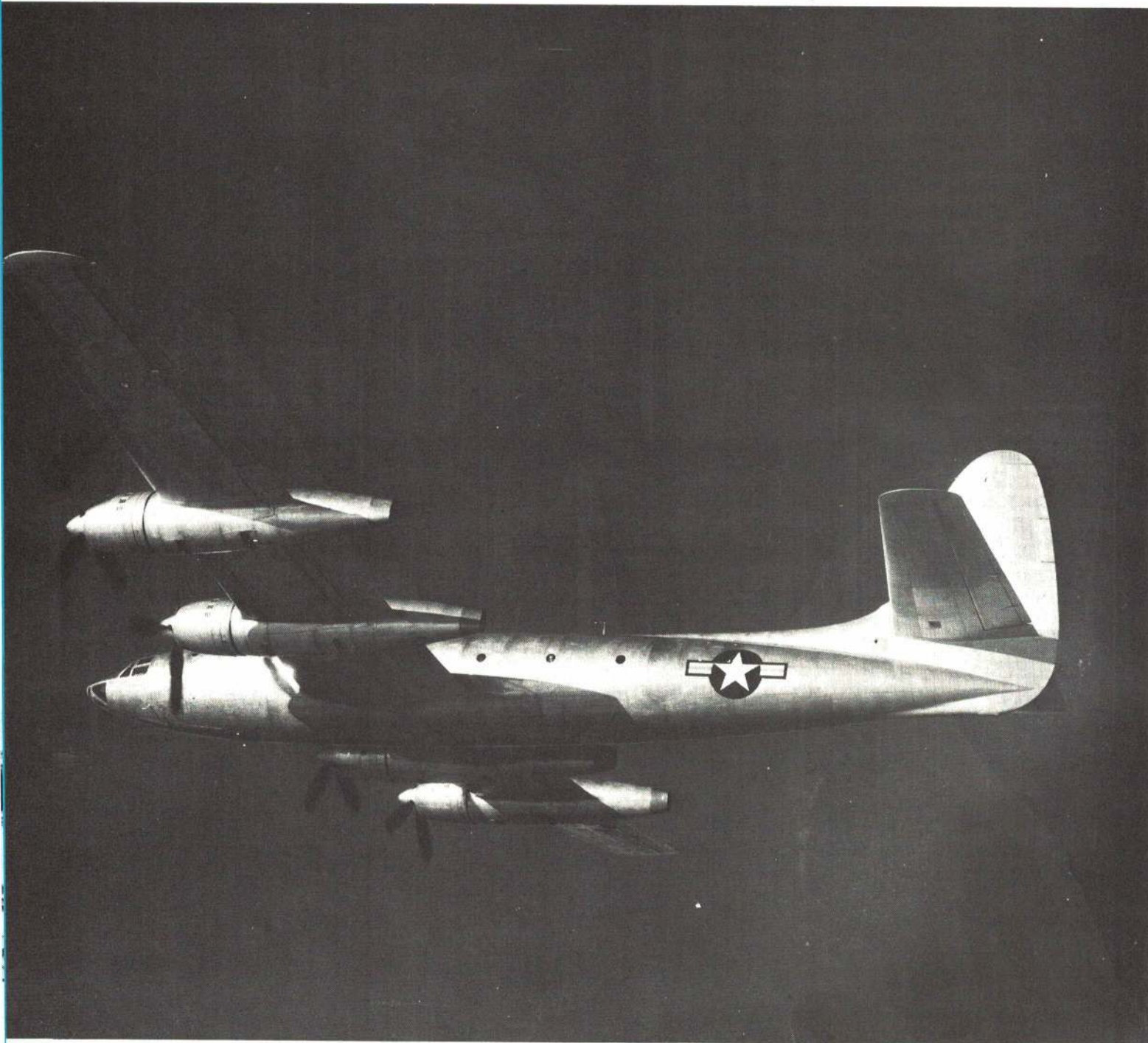
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RAINBOW

No pot of gold rewarded Republic's
magnificent design, ordered by military and airlines alike.

by WALT BOYNE



In mid-1943, the Air Force laid out a seemingly unattainable requirement for a fast, long-range photo-reconnaissance aircraft which would operate independently and with impunity over the enemy's heartland. Alexander Kartveli, of Republic Aviation, Farmingdale, N.Y., master designer of the P-35 and P-47, saw not only the difficulties but the possibilities inherent in the requirement.

Speed, altitude and range would offer not only immunity to attack, but also the basis for a post-war commercial transport which would break Republic away from its strictly

military single-seat fighter background. Kartveli knew that at the state of the art at that time, those requirements could be met only by combining the new Pratt & Whitney R-4360 engines with an airframe that was aerodynamically perfect, and so he proceeded to lay unprecedented demands upon his engineers.

Republic's proposal for the revolutionary design was successful in obtaining an Air Force contract for two aircraft, at a total cost and fee of \$6,804,684. A mock-up was ready by June 1944, and various changes suggested then were incorporated in a final mock-up

inspection in November of the same year.

Kartveli had demanded and achieved aerodynamic perfection in the XF-12, surely the most beautiful four-piston engine aircraft ever built. In spite of its performance, the Rainbow met head-on with the upset economy of the late 1940's, and only two of these magnificent aircraft were completed.

The fuselage was a cigar shaped cylinder, swelling from a smooth plexiglass point at the nose to a 10'6"-dia. circular cabin, then tapering to a conical tail section.

The unpressurized nose section offered clean entry and wonderful visibility in fair weather. Icing or precipitation would have been a problem, however, and production models were to have the pointed nose section formed into two halves, which could be retracted into the fuselage sides. A flat windshield, forming the forward wall of the pressure cabin, was equipped with windshield wipers and defrosters.

The entire plane was free of the usual bumps, holes and protrusions—camera ports were covered with flush-fitting sliding covers, and the radome was retractable. Only a few aeri-als were allowed to mar the polished symmetry, and it was planned that even these

At Farmingdale plant, Rainbow posed with Republic's then-new Seabee and a "Jug."

would later be replaced by flush type antennae.

Kartveli's uncompromising requirement for aerodynamic cleanliness resulted in some knotty design and structural problems. To obtain minimum drag, the wing was mounted at mid-position on the fuselage at a right angle to the curved fuselage side. To maintain a free cabin passage, Republic's engineers avoided the usual practice of carrying the spars through the fuselage. Instead, the wing spars were joined to massive double-ring bulkheads which served as dividers for a cabin compartment.

Similarly, the nacelles were mounted in mid-position on the wing. These nacelles, of an extreme fineness ratio, introduced two innovations. An annular fan, similar to the type used on the FW-190, forced cooling air through the engines. At the rear of the accessory section, a sliding ring cooling slot was used, instead of conventional cowl flaps.

Wing leading edge intakes provided for the carburetors, intercoolers and oil coolers. Note annular fans behind spinners. Even the cowl flaps were eliminated by sliding ring cooling slots. Turbosuperchargers mounted in each nacelle. American and Pan Am placed firm orders for 26 of the 40-46 passenger craft—but air travel boom fizzled.

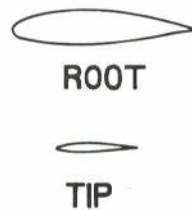
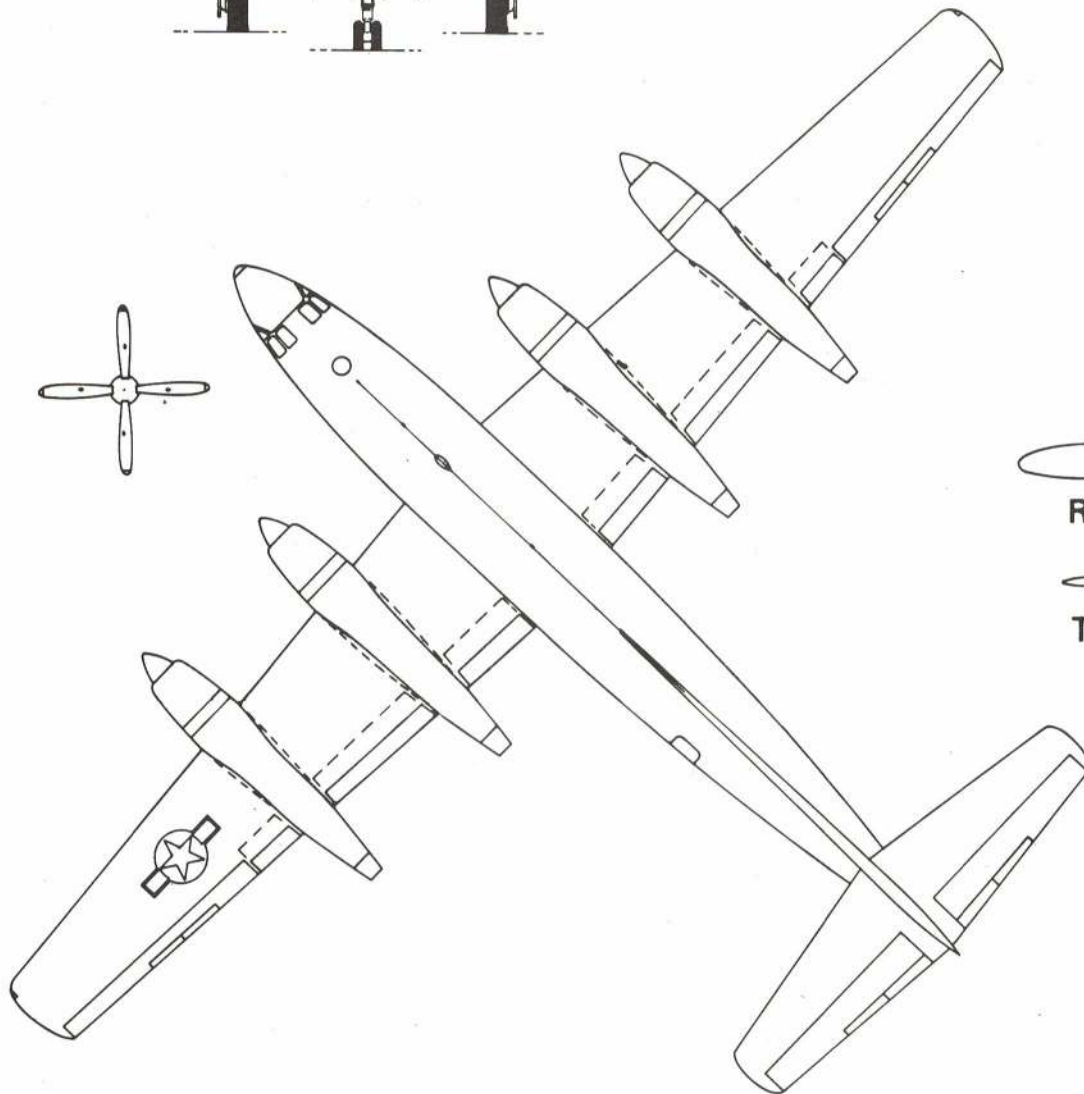
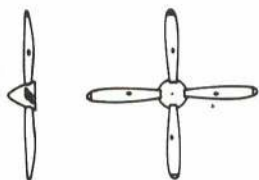
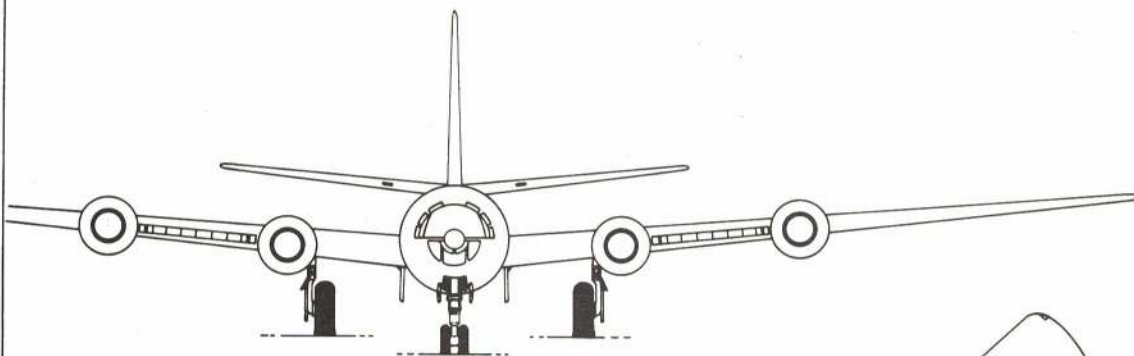
This combination, far in advance of its day, would play a villain's role in the testing of the Rainbow.

In the rear of the nacelles, each almost as long as a P-47 fuselage, were mounted two G.E. exhaust-driven turbosuperchargers which added almost 325 hp to each engine's output.

The Farmingdale engineers were aware of the aerodynamic problems to be expected at high Mach numbers, and the laminar flow wing was designed accordingly. Maximum diving speed was 610 mph or approximately .8 Mach, and automatically operated dive

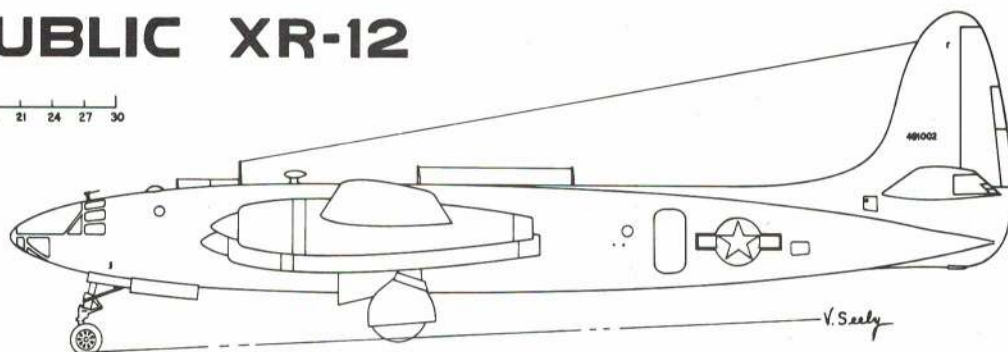
(Continued on page 76)





REPUBLIC XR-12

0 3 6 9 12 15 18 21 24 27 30



All-balsa towline job catches thermals just like the real plane.
Learning flight trimming will be easy with this model.

SCHWEIZER 1-29

T by DAVE THORNBURG

Here's a great deal to be said for a painstakingly detailed superscale model with working gyrocompass and scale rivet spacing—but every time I sit down to work up plans for such a plane, it comes out as an all-sheet profile model that is only semi-scale at best.

There's also a lot to be said for this type of plane, especially if you're not yet an expert at building models. From certain angles, sheet profiles look excitingly close to the real thing. You can build an entire profile job in an evening, so if a stray thermal carries it off to the Great Blue Gobbler on the first flight, you're not out much time or money, and you've at least had a memorable flight. You get a lot of air time out of such models, for you don't mind putting them up in less-than-ideal conditions.

The little Schweizer 1-29 has all this going for it and more. It is really a fine performer, and very easy to make fly. Though not really scale in any of its outlines, it has a cute and classically "sailplane" look, and draws a lot of comment wherever it's flown. Not even the true scale bugs seem to notice the deviations, for the real 1-29 is not a common sight—it's a one-of-a-kind design cooked up by the Schweizer folk back in the late 1950's to test the feasibility of laminar airfoils on sailplanes. The fuselage and empennage are basically the same as the popular 1-23, but the 1-23 wing is less practical for our purposes, since it tapers sharply to almost a needle point at the tip.

Construction

If you build the fuselage from two pieces of 2" wide balsa, there will be a joint right through the wing slot, as the plans show. This makes cutting the slot much easier than if the fuselage were a single sheet. The easiest way to outline the fuselage on the balsa is to lay the full-size plan over one piece of the wood, lining one edge up with the joint line on the plans. Then make shallow pinholes every 1/4" or so along the outline of the part. When you remove the plans, the outline will be clearly visible on the wood. Follow the line of pinholes with a modeler's knife or single-edge razor. Repeat this procedure for the other half of the fuselage and your 1-29 will be about 1/3 finished!

Set the fuselage aside and begin on the wing. If you can find a piece of four-in. wide Sig Tapered stock, your work is done for you. Just take a sanding block (medium paper) and round the leading edge to the cross section shown on plans. Also round off the slight point formed in milling on the top surface of the wood, about 1 1/2" back from the leading edge. Now cut the wing in half exactly in the center, using a triangle or T-square to be sure the cut is precisely perpendicular to the leading edge. This is a good opportunity to check your airfoil sanding: is the cross section

SCHWEIZER 1-29

at the cut you just made the same as that shown on the plans?

With the same medium sanding block, bevel both halves of this center joint just slightly, so that when put back together, the wing forms a shallow "V" when viewed from front or back. This is the dihedral so necessary to a model's stability; it should be about 2 1/2" on each side. The easiest way to attain this is to lay one wing panel flat on your workbench and prop the tip of the other up 5" while gluing the beveled roots together.

Let this center joint set thoroughly before moving the wing. When dry, apply a 3 x 4" piece of light Celastic or heavy silk to the bottom of the center section. If you've never worked with Celastic, it's easy. Cut the piece to size, half-fill a shallow saucer with dope thinner, pass the Celastic through this thinner "bath" soaking it completely, and flop it in place on the wood. It will dry in two to three hours. Incidentally, if you have used model airplane cement in the dihedral joint, the thinner may soften it temporarily, so be prepared.

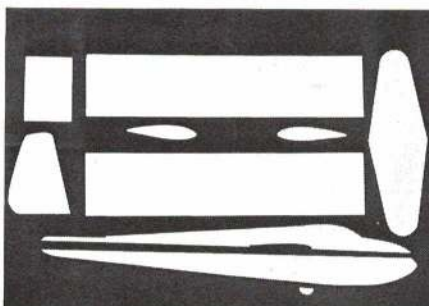
This is a good time to cut the empennage (the collective term for rudder and stabilizer) from some good, straight-grained, medium-soft 3/32" balsa. Again, pinpricking the outlines onto the balsa is the easiest method, unless you really want to cut up your plans. Round the edges of these pieces for streamlining and set them aside. Don't dope them until they're joined to the fuselage, as they're likely to warp.

You're now ready to assemble the whole airplane. Perhaps the easiest method is to glue wing and empennage to the top half of the fuselage first, jiggling everything carefully with pins and props and checking the alignment of each piece carefully. Be particularly careful in aligning the empennage; it is so far from the wing, which is the aerodynamic center of the model, that slight misalignments have a lot of leverage.

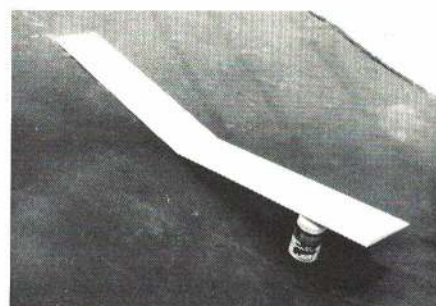
While everything is drying, you can make all of the little accessories that really "make" your model—the tip plates, for instance. Cut them out of 1/32" plywood. If you know an active modeler, you can probably find pieces of ply in his scrapbox for these and for the wheel, thus saving money. Otherwise, you might make the tip plates of hard 1/16" balsa, running the grain vertically for strength. Don't leave them off—they're worth the trouble. They act as dams to keep the high-pressure air under the wing from wrapping around the tip into the vacuum above the wing, destroying tip lift and causing a lot of extra drag. Besides, the real 1-29 has them.

Bend the tow hook from a paper clip and glue it solidly in place on the lower half of the fuselage. When the rest of the plane becomes dry enough, this lower half can be cemented on. Add the wheel and the tip plates and your 1-29 is structurally complete.

(Continued on page 66)



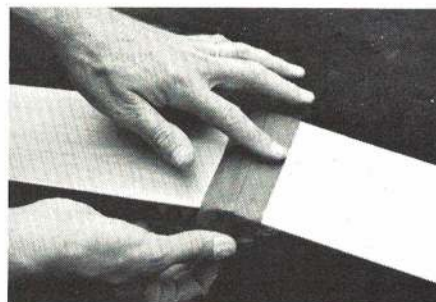
The pieces: tip plates are plywood; rectangle in upper left is Celastic (a most useful material the Tenderfoot should try) for wing center joint.



Prop up one panel 5" and glue the dihedral joint. Epoxy recommended here. Position waxed paper under the joint so your wings won't stick to the work table.



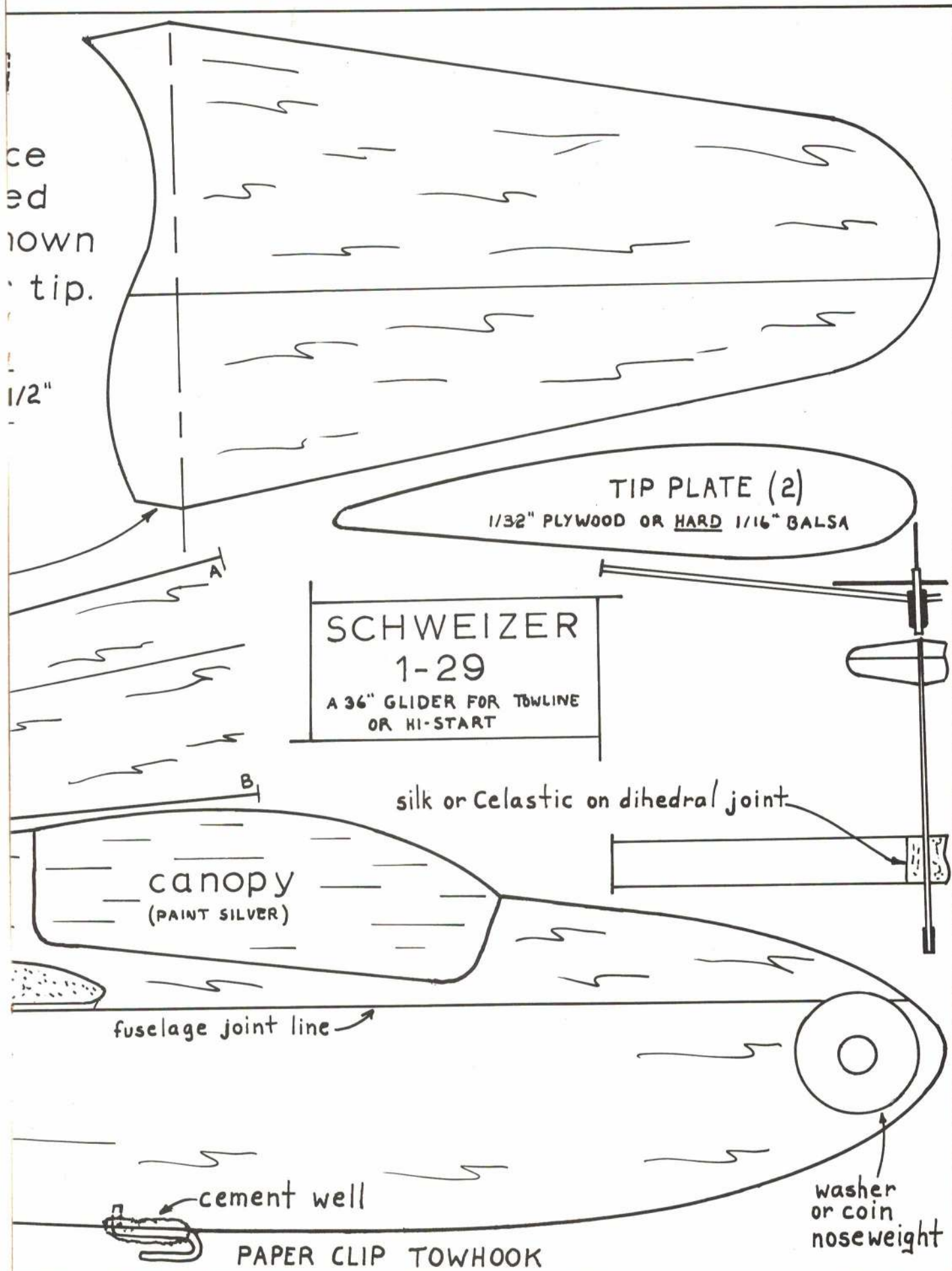
The 36-in. winged glider should weigh under 4 oz. Clay is suitable and easily varied nose weight.



If you don't have Celastic, reinforce the dihedral joint with glue-saturated silk. It is a very high stress area.

ce
ed
own
tip.

1/2"

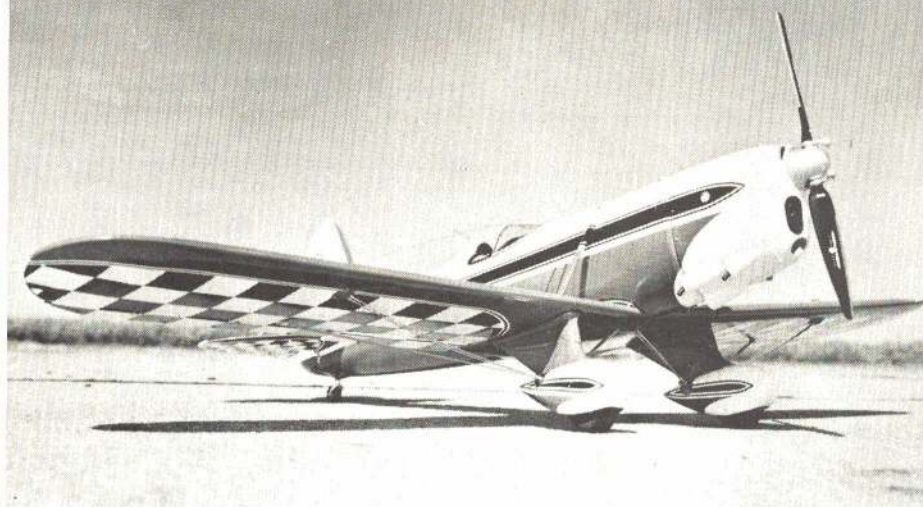


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**DEWEYBIRD
MARK I**

KIT CL-15

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.049 ENGINE

WINGSPAN: 22 1/2"

SCALE APPEARANCE



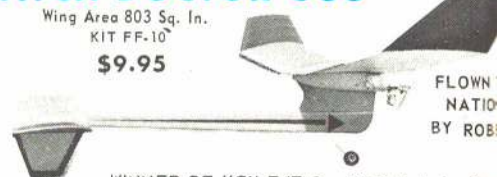
Designed by Dave Shipton, owner of Hobby Hide-A-Way, Delavan, Illinois. The Deweybird is a semi-scale control line model of Jim Dewey's midget. Dave has created a model very easy to build and fly. The beginner should have no trouble with this airplane. Characteristics are such that the advanced modeler will enjoy it. It will perform well on a good .049 engine. There will be larger Deweybirds out soon.

**WINNER "B" F/F GAS 1971 NA
WITCH DOCTOR 800**

Wing Area 803 Sq. In.

KIT FF-10

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NATION
BY ROBB

WINNER OF "C" F/F Gas 1970 Nats by Gray

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SERIES

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SHAPED BALSA

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SHAPED BALSA WING

Semi-Scale

P-40 WARHAWK

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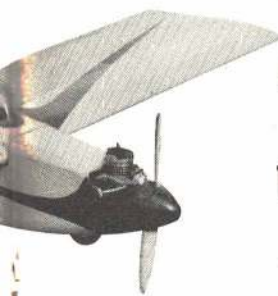
KIT K

1/2 A Control

BUBLER by Brad Shepherd

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38" WINGSPAN
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NATIONALS
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BANSHEE

KIT CL-11

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5th Place 1971 Nationals Jr. Stunt
by Dan Osdoba

U/C PROFILE STUNTER WITH FLAPS

The BANSHEE was designed by Mike Stott to create a control line stunt model that would be easy to build, yet have flying qualities comparable to the best stunters. The BANSHEE has proven itself on both points. Very easy to build, it flies like the Nationals-winning Chipmunk. Docile enough for a beginner, yet the maneuverability to please the expert. A great addition to the Sig kit line.

Aerobiipe



KIT RC-25

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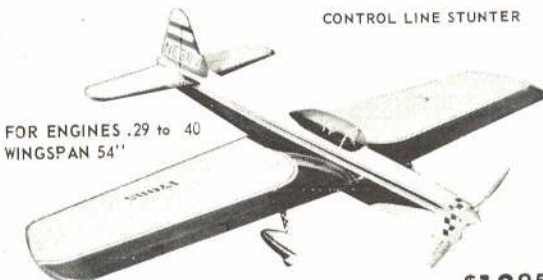
Flies well on single channel equipment.

The AEROBIPE was designed as the ideal sportplane for the new light weight proportional radio gear. Simple balsa construction makes a strong, light weight model that is really fun to fly. Make your next model the AEROBIPE and enjoy the thrill of flying a high performance "biplane".

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SEMI-SCALE CHIPMUNK

CONTROL LINE STUNTER



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4th Place CL Precision Aerobatics in 1971 by Dave Osdoba

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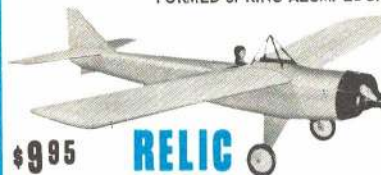
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STRIPAILERONS
SCALE APPEARANCE
MOLDED ENGINE COWLING
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KIT RC-20 ENGINES: .049-.15
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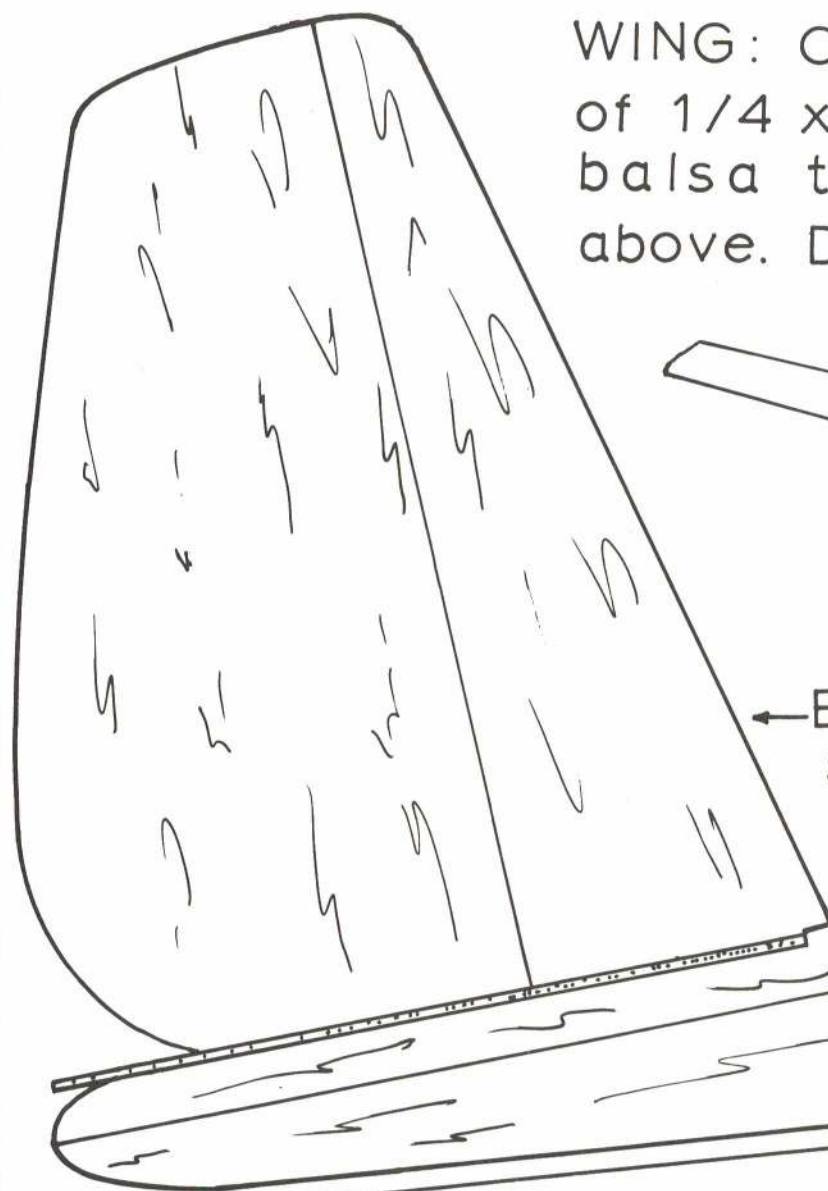


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401 S. FRONT STREET
MONTEZUMA, IOWA 50171



WING: Cut or sand one piece of $1/4 \times 4 \times 36$ Sig taper balsa to cross-section shown above. Dihedral $2-1/2''$ per



← Empennage
 $3/32''$ BALSA

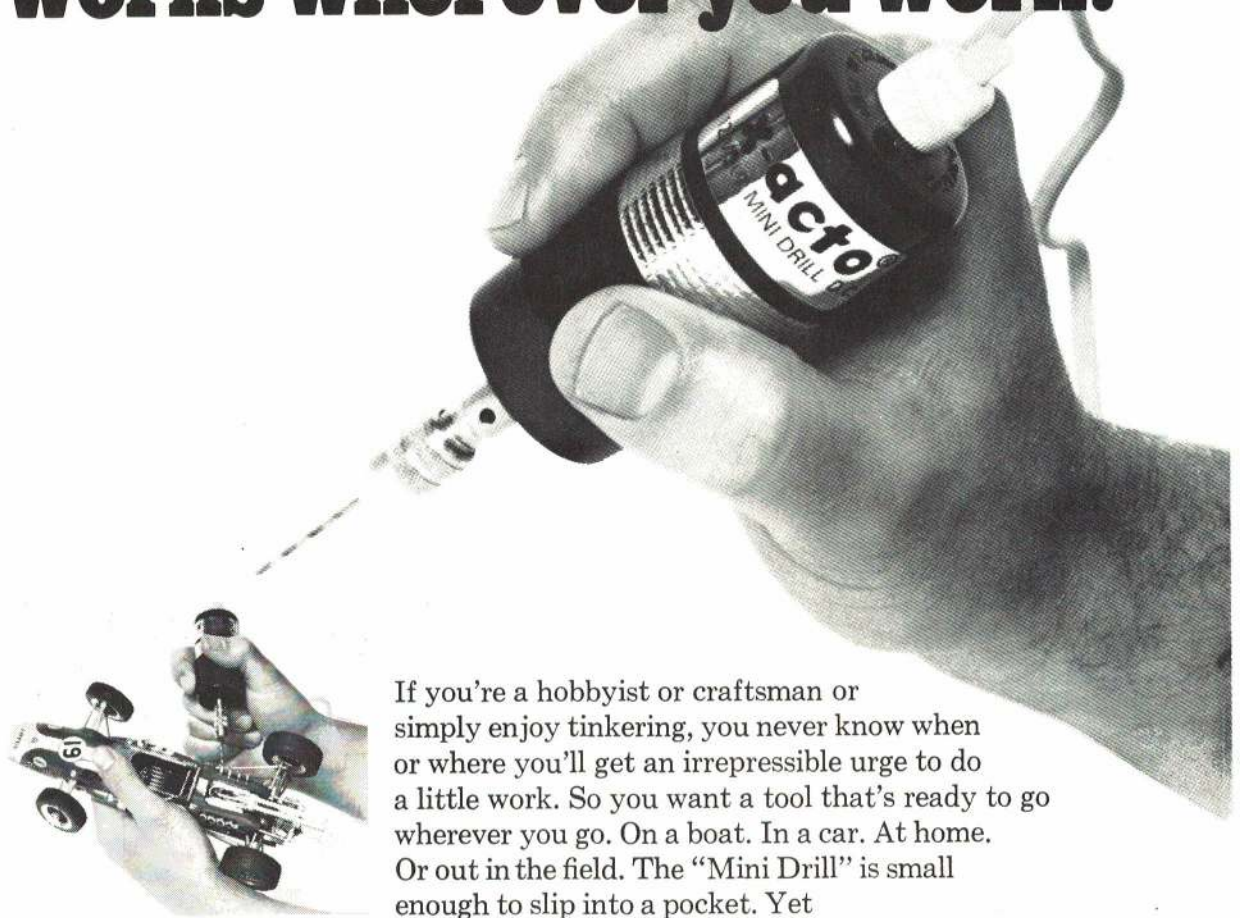
Fuselage: $1/4''$ medium balsa

r.i.p.

$1/16''$ PLY WHEEL



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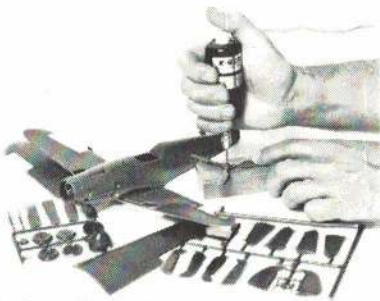
enough to slip into a pocket. Yet sufficiently fast and powerful to drill, polish or burnish, wood, plastic, aluminum, copper, brass, gold, silver—and even mild steel. Perfectly miniaturized for model planes, boats, railroads, rockets, cars, ceramic work, jewelry making, glass etching. Easy to handle and lightweight. Low voltage makes it safe where water is used.

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"KRABBEKUTTER"

German Shrimp Boat. This one makes a 20 inch long model with planked hardwood hull, brass fittings; all gear, including dip nets.

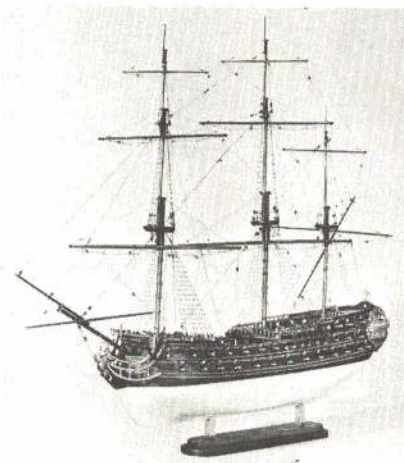
KIT, COMPLETE with fittings — \$36.00.

AUTO FERRY — About 20" in length, easy to build. Planked hull construction. Typical boat ferry, now in use in Denmark. Kit and fittings complete — \$14.00.

VEDETTE — Model of a luxury power launch, about 30" in length, makes a beautiful display piece. Planked hull construction. Complete with fittings — \$24.00.

TRAWLER — Model of North Sea Fishing Trawler, about 26" in length. Excellent detailing. Complete with fittings of brass — \$29.00.

VIKING SHIP (DMI) — Beautiful model of authentic Viking Ship. About 20" in length. Complete with sail and decorative side mounted shields — \$7.00.



NORSKE "LOVE" Norwegian Lion. 40" long, 36" high. With fittings — \$101.00.

All With Planked Hulls



WASA Warship from 1628, 23" long; 23" high. Complete with fittings — \$42.00.



SANTA MARIA. 21 1/4" long, 17 1/4" high, 5" beam. With fittings — \$25.00.



JYLLAND Frigate. 39 3/4" long, 24 3/4" high. Complete with fittings — \$66.00.



North Sea Cutter 21" long, 16" high complete with fittings..... \$32.00.



SPERWER — Model of Dutch Canal Boat, in scale of 1:15. Length 23 1/2", Width 9", height 32". Kit comes complete with sails and decorative side paddle. Complete with fittings of brass — \$34.00.



DRAGON International Racing Class. 31" long. Complete with fittings — \$30.00.

Billing Boat Ki

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Cutty Sark

Scale 1:75 Wood Kit You Really Build!

Planked Hull Construction No. 459-Kit \$35.00

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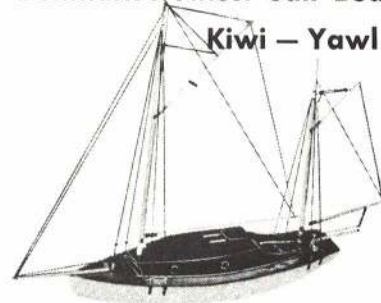
Total \$91.00

Last of the Clippers, the original Cutty Sark is now an exhibit and school for yachtsmen in Greenwich. This kit was scaled from the original plans in exact detail. Many hours of careful building pleasure will give you a 44" show piece that is 26" high and 6" wide.



Denmark's Finest Sail Boats

Kiwi - Yawl



Excellent quality construction kit. 22 1/2" long by 19 1/2" high. Includes ribs, planking, Brass fittings, cloth for sails. Complete kit, including fittings — \$12.00.

"Pirate" Racing Yacht

Approx. 24 1/2" long. 33" overall height. Mast 27" high. Excellent quality wood construction kit including keel plate, ribs, and planking. Detailed instructions and plans.

Complete with sails metal keel, and fittings. \$12.00



Every kit contains all parts to complete the model, including fittings.

Every kit has English instructions.

Every kit is planked hull construction. No pre-fab pieces — model must be built from keel to deck.



BLUENOSE. 35" long, 27" high. Beam 5 1/2" with all fittings — \$48.00.



VIKING SHIP KIT, Complete. This exciting new kit by Denmark's Finest Models features planked hardwood hull, and is an authentic reproduction, scaled down to 26" long by 6 1/2" wide — \$16.00.



ZWARTEE ZEE Tugboat. 3-3/4" long, 11 1/2" high, 5" beam. With fittings — \$54.00.

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11

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2. Can be finished to any color	Yes	Yes
3. Time to cover 60" wing	29 minutes	65.3 minutes
4. Price per yard unfinished	\$2.95	\$1.50 to \$2.25
5. Weight per yard unfinished	1.2 ounces	½ to 1 ounce
6. Unfinished appearance	Semi-gloss, non-porous	Dull, porous
7. Finishing coats needed	3 to 4	10 to 15
8. Price per yard to finish	\$0.85 to \$1.25	\$2.50 to \$3.75
9. Effect on structural strength of model	Great	Slight
10. Receives decals—all types	Yes	Yes
11. Type of covering	Woven Dacron fabric	Woven Silk fabric

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NOVEMBER 1971

MODEL AVIATION

Official magazine

A.M.A. NEWS



Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

INTERESTED IN JOINING A.M.A.? Over 32,000 did in 1970. Membership details may be had by requesting FREE BROCHURE from above address

The Big Cool Nats

Nats photos by U.S. Navy, Bill Crame and AMA HQ staff.

BIG is what it was—bigger even than last year's bigger than ever National Model Airplane Championships. Over 1600 registered to Participate in the 1971 Nats, well over a hundred more than in 1970.

The final registration statistics included twelve hundred and sixty-four contestants and over four hundred mechanics. Add to this about one hundred and twenty officials and over three hundred naval air station personnel (150 assigned directly to the competition; about 200 more to general support, traffic control, etc.). The grand total of people directly involved was more than two thousand—no wonder that the Nationals is the world's biggest model meet!

COOL is also what the '71 Nats was. The usual Nats weather of high heat and humidity was not part of the scene this year. The weather was consistently comfortable during the day and great for sleeping at night—some people even took to blankets and it wasn't unusual on some days to see jackets or windbreakers being worn.

The rain gods also smiled on the '71 Nats. The morning of the first day's competition saw a very brief sprinkle that soon turned to bright sunshine. And the day after the Nats ended, the rain came down in sheets. But during Nats week the rains held off and the weather was mostly full of blue skies and puffy clouds.

The wind gods, however, decided that the final day should cool off even more. Stiff breezes almost blew out the Sunday events. In Free Flight, C Gas and Rocket Power events had a rough time, as did A & B Pattern in Radio Control. Likewise, FAI Team Race and the Jim Walker Stunt Finals in Control Line suffered in the winds.

The Sunday Model Air Show went on with spectacular performances despite the winds. Every type of model was flown although some would normally not be considered windy-weather planes: a Free Flight Helicopter, a Control Line Autogyro, Rubber Powered models ranging from a Delta Dart to a huge Unlimited class design.

The wind claimed one victim during the air show—a big beautiful Control Line B-29 tore loose and sailed over the bleachers after having flown many laps. The wind apparently added enough extra load to pop open one snap link that had just before withstood a pull test of over a hundred pounds. Luckily the huge ship hit in a small clearing. It was a total loss, but nobody got hurt.

(Continued on page 63)



Grand National Championship Trophy received by Bucky Servaites from Miss Model Aviation, Laurie Frick, and the Chief of Naval Air Reserve Training, Admiral Greer. This was the third such victory for Servaites, a remarkable achievement. Miss Frick is from Glenview, Ill.



A friendly clasp, in left photo, is given by Navy Nats Project Officer, Commander Marty Servis, to Ed Abram, AMA Jr. Committee Chairman and Nats Delta Dart Director. Delta Dart building session in progress. The thrill of getting one's first model to fly and fly well is exemplified by Liz Sebastiani, right, age 13, from Glenview. U.S. Navy photograph.

NATIONAL CHAMPIONS

GRAND CHAMPION

Bucky Servaites, Dayton, Ohio

JUNIOR

Brian Pardue, Greensboro, N.C.

SENIOR

Brian Webster, Manchester, Tenn.

OPEN

Bucky Servaites, Dayton, Ohio

CONTROL LINE CATEGORY

Danny Bartley, High Point, N.C.

FREE FLIGHT CATEGORY

Frank Wolff, Massapequa, N.Y.

INDOOR CATEGORY

James Richmond, Davidson, N.C.

RADIO CONTROL CATEGORY

Bob Smith, Panorama City, Calif.

SCALE CATEGORY

Robert Talchik, Chicago, Ill.

AMA CLUB TEAM

Greensboro (N.C.) Prop Twisters (John D. Comerford, Danny W. Bartley, Stefan A. Jeglinski, Michael P. Langlois, Brian W. Pardue)

NATS TEAM

Dixie Whiz Kids (Danny W. Bartley, Mary Lou Brown, Gary D. McGraw, Brian W. Pardue, Brian Webster)

PERPETUAL TROPHIES & SPECIAL AWARDS

MULVIHILL (high time regardless of age, Unlimited Rubber): Robert K. Sifflet, Baltimore, Md.

TULSA GLUE DOBBERS (high time regardless of age, Outdoor HL Glider): Richard D. Mathis, Richardson, Tex.

HOFFMAN MEMORIAL (high time regardless of age, A FF Gas): Eugene C. Wald, St. Paul, Minn.

JIM WALKER (winner of Junior-Senior-Open flyoff, CL Stunt): Bill Werwage, Berea, Ohio

STOUT INDOOR (high time regardless of age, Indoor Cabin): Ronald J. Plotzke, Mt. Clemens, Mich.

TESTOR'S (best model finish, regardless of age): Leroy Gunther, Allen Park, Mich.

STOUT COMMERCIAL (high time regardless of age, Indoor Stick): James W. Richmond, Davidson, N.C.

DICK BLACK (high time regardless of age, Coupe D'Hiver): Michael M. Fedor, Grand Prairie, Tex.

STERLING MODELS (most Scale static score of any category qualifying by official flight): Malvin E. Meador, Suitland, Md.

1971 NATS SPONSORS

Approximately 600 awards were provided through the contributions of the following:

Ace R/C, Inc., Aero Sports & Craft, Inc., Al's Hobby Shop, Ambroid Company, Inc., American Aircraft Modeler, Aristo-Craft Distributive Miniatures, Competition Models, Inc., Dee Bee Engineering, Du-Bro Products, Inc., Dumas Products, E. K. Products, Inc.

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NATS ENTRIES

	Jr.	Sr.	Open	Total
No. of Entrants	202	224	838	1264
No. of Mechanics				426

Entries by Event

	Jr.	Sr.	Open	Total
Control Line				
Scale Racing	21	39	78	138
Rat Racing	9	29	63	101
B Proto Speed	11	12	25	48
1/2A Prof. Proto	43			43
1/2A Proto Speed	14	22	39	75
FAI Speed	6	11	25	45
1/2A Speed	26	15	27	68
A Speed	12	13	27	52
B Speed	11	12	27	50
C Speed	15	8	27	50
Jet Speed	1	4	26	31
Aerobatics	11	24	66	101
Combat	12	47	87	146
FAI Team Race	0	6	22	28
Scale	4	16	26	46
Carrier I	3	6	32	41
Carrier II	3	3	32	38
Prof. Carrier	5	18	34	57
Indoor				
Scale	11	8	34	53
H.L. Glider	29	37	70	136
Paper Stick	16	16	35	68
Cabin	7	10	15	31
Stick	11	11	32	54
Free Flight				
1/2A Gas	59	64	202	325
A Gas	47	58	197	302
B Gas	10	30	130	170
C Gas	9	23	126	158
FAI Power	7	20	76	103
Wakefield Rub.	5	11	43	59
Unlimited Rub.	21	17	60	98
Coupe D'Hiver	13	15	68	96
Nordic Glider	43	43	132	218
H.L. Glider	85	70	149	304
Rocket Power	18	23	65	99
Scale	8	12	44	64
Helicopter	0	1	6	7
Radio Control				
C Pattern Ex.	0	7	64	71
C Pattern Nov.	4	7	38	49
B Pattern	0	2	23	25
A Pattern	5	6	32	43
Scale	1	1	32	34
Pylon Form. I	4	8	69	81
Pylon FAI	1	4	43	48



Above Left, Yeoman 1st Class Larry Pendleton gives Nats kit and "gob" hat to Jack Beck. Above R, Asst. D.D. Director Ken Wilson hands out kit to one of 975 registrants. Below, some of Sunday Air Show models—plagued by high winds.



CONTROL LINE

4. G. Caldwell	160.22
5. C. Heminway	159.65

1/2A SPEED

Junior	MPH
1. Brian Pardue	99.08
2. Kelly Poe	97.36
3. Ross Legg	94.70
4. M. Langlois	84.39
5. Bruce Pallet	82.39

Senior

1. Terry Herron	97.26
2. Danny Bartley	91.33
3. Marty Thompson	87.77
4. Mary Brown	87.34
5. C. Schubert	83.45

Open

1. Warren Kurth	96.01
2. Finn/Morton	95.10
3. G. Brown III	95.00
4. Bucky Servaites	90.92
5. Robert Adair	87.19

A SPEED

Junior	MPH
1. Kelly Poe	143.83
2. Brian Pardue	129.72
3. Glen Vansant	121.41
4. J. Comerford	117.60
5. M. Langlois	104.73

Senior

1. R. Wisniewski	151.45
2. Terry Herron	146.16
3. Gary McGraw	145.34
4. Mary Brown	138.19
5. C. Schubert	137.66

Open

1. Dodge/Stegens	164.10
2. B. Wisniewski	163.57
3. G.D. Hooke	161.08

B SPEED

Junior	MPH
1. Kelly Poe	157.14
2. Brian Pardue	142.01
3. M. Langlois	139.05
4. J. Comerford	126.44
5. Dennis McGraw	119.63

Senior

1. Danny Bartley	173.17
2. C. Schubert	162.98
3. James Wade	158.67
4. Gary McGraw	158.67
5. Mary Brown	148.95

Open

1. B. Stadiem	170.87
2. C. Heminway	168.00
3. Fred Randell	164.77
4. Thomas Upton	164.02
5. James Bussell	158.67

C SPEED

Junior	MPH
1. Kelly Poe	147.60
2. Brian Pardue	143.71
3. Glen Vansant	138.41
4. Dennis McGraw	137.56
5. M. Langlois	123.07

Senior

1. Danny Bartley	185.11
2. Brian Webster	178.68
3. Gary McGraw	175.03
4. Terry Herron	174.86
5. Mary Brown	163.72

Open

1. Arpino/Garzon	184.73
2. Ted Black	184.16

3. B. Stadiem	183.41
4. James Pillero	180.47
5. Neeson/Neeson	177.27

JET SPEED

Jr.-Sr.-Op.	MPH
1. Myrle Hoyt	185.49
2. Mike Olson	179.03
3. Charles Serie	170.87
4. Ron Iyaldi	170.23
5. S.A. Olson	170.06

FAI SPEED

Junior	KM/HR
1. Brian Pardue	190
2. Dennis McGraw	168
3. J. Comerford	165
4. M. Langlois	155

Senior	
1. R. Wisniewski	216
2. Danny Bartley	185
3. Tim English	181
4. Gary McGraw	165
5. Mary Brown	160

Open	
1. Carl Dodge	234
2. C. Vassallo	221
3. Glenn Lee	218
4. R. Heminway	208
5. Tim Clary	201

1/2A PROTO SPEED

Junior—Profile	MPH
1. Bruce Paillet	79.44
2. Barry Paillet	78.99
3. Brian Pardue	75.16
4. Mary Kirn	73.95
4. Stephen Wozny	73.95
5. W. Gifford	73.11

Junior	
1. Ross Legg	82.05
2. Kelly Poe	79.83
3. Dennis McGraw	73.05
4. Paul Whiddon	72.09
5. Marcus Day	71.88

Senior	
1. Danny Bartley	96.89
2. James Wade	90.69
3. Terry Herron	82.54
4. Mary Brown	76.40
5. Dan VanAtta	69.34

Open	
1. Warren Kurth	92.79
2. Thomas Upton	86.63
3. R. Bradshaw	82.84
4. James Bussell	81.23
5. B. Servaites	75.28

B PROTO SPEED

Junior	MPH
1. Kelly Poe	133.28
2. Glen Vansant	102.35
3. W. Gifford	96.89

Senior	
1. Danny Bartley	148.58
2. Terry Herron	146.52
3. Mary Brown	139.05
4. R. Wisniewski	136.72
5. Tim English	134.29

Open	
1. J. Bussell	147.00
2. J. Delaney	146.64
3. Finn/Morton	140.35
4. J. English	138.09
5. G. Brown III	137.24

AEROBATICS

Junior	Points
1. R. Depalma Jr.	482.25
2. Alan Adamisin	471.00
3. K. Stevens, Jr.	413.50
4. Mike Waldron	391.00
5. Dan Osdoba	388.25

Senior	
1. Mike Jackson	505.00
2. D. Adamisin	482.75
3. M. Thompson	455.00
4. David Osdoba	427.00
5. Bill Miller	424.75

Open	
1. Wm. Werwage	470.50
2. Gene Schaffer	463.50
3. Tom Warden	459.00

Below L, bad Carrier landing by Rolland Baltes? Not really—arresting line broke. Below R, Open Combat winner Jerry Haupt. Bottom, lots of action in Combat, even the launch.



4. Robert Baron	454.75
5. R. Lampione	452.75

COMBAT

Junior	
1. D.P. Morris	
2. P.T. Bush	
3. P.R. Rowan	
4. T.L. Rule	
5. M. Mangan	

Senior	
1. Bernard Varnau	
2. David Bush	
3. Dave Tribble	
4. Masunori Matsuzaka	
5. John Abraham	

Open	
1. J. Haupt	
2. F. Neal Rose	
3. George Cleveland	
4. Will Rogers	
5. Howard Rush	

FAI TEAM RACE

Jr.-Sr.-Op.	Time
1. Kelly/Parent	9:50
2. Albritton/Marvin	9:59
3. Hodgkins/McCollum	10:10
4. Jackson/Theobald	
5. Fischer/Oesterle	

RAT RACE

Junior	Time
1. Dan Barker	6:26
2. Mike Waldron	6:41
3. Mike Managan	
Senior	
1. Ed Wallace	5:12
2. M.A. Schmieder	5:24
3. Ed Niemiec	5:26
4. M.J. Hainen	5:35
5. Tim Zimmer	5:40

Open	
1. F. Estill	5:24
2. Norman Dicks	5:29
3. John Kilsdonk	5:30
4. Gary Fentress	5:35
5. Norris Sparks	5:38

SCALE RACING

Junior	Time
1. Mike Waldron	9:24
2. S.M. Wozny	9:26
3. Wm. Votsavek	12:37
4. J. Morrison	12:48
5. Mark Bauer	13:11

Senior	
1. Ed Wallace	7:25
2. Wm. Cook	7:38
3. Tim Zimmer	7:39
4. Andy Cromer	7:45
5. Ed Niemiec	7:55

Open	
1. Frank Sanders	7:20.2
2. Daniel Jones	7:20.8
3. A. Hodgkins	7:20.9
4. John Ballard	7:25.0
5. James Joy	7:45.5

NAVY CARRIER PROF.

Junior	Points
1. Randy Hackett	254.52
2. Mark Stidham	201.65
3. Bryan Horton	88.55

Senior	
1. Tim Sparks	298.51
2. Richard Dolg	293.89
3. John White	290.33
4. S.R. Snyder	283.03
5. D.E. Williams	237.22

Open	
1. J.P. Flinn	338.23
2. H.N. Hackett	334.75
3. James Womack	328.80
4. Robert Wright	318.54
5. Roger Paskell	281.80

NAVY CARRIER I

Junior	Points
1. R. Sawicki	446.15
2. Dale Johnson	373.82

Senior	
1. Terry Herron	487.06
2. R.D. Wright	423.19

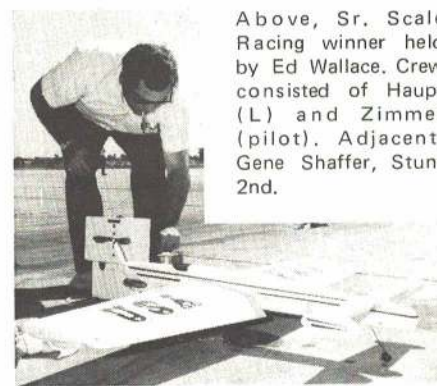
Open	
1. R.J. Sawicki	542.99
2. Ray Willmann	535.87
3. M.E. Bedard	527.92
4. H.D. Wallick	518.18
5. M. Sawicki	517.74

NAVY CARRIER II

Junior	Points
1. Dale Johnson	473.95
2. R. Sawicki	442.59

Senior	
1. Bill O'Conner	363.98
2. Paul Tegel	362.12

Open	
1. E.R. Willmann	580.50
2. James Finley	558.77
3. R.J. Sawicki	546.50
4. E. Gross, Jr.	543.30
5. M. Sawicki	533.24



Above, Sr. Scale Racing winner held by Ed Wallace. Crew consisted of Haupt (L) and Zimmer (pilot). Adjacent, Gene Shaffer, Stunt 2nd.



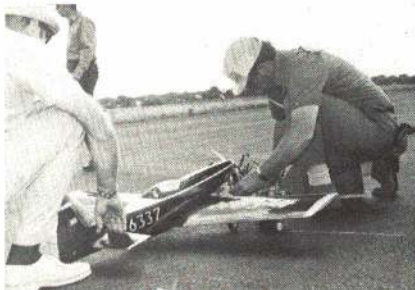
Dennis McGraw flew Rossi-powered Kansas Twister to 2nd in Junior FAI Speed. Engine is fitted with megaphone pipe. Bill McGraw lends a hand.



Danny Bartley retained CL Category Championships. He was first in many Sr. events, often with speeds higher than Open. C Speed winner shown.

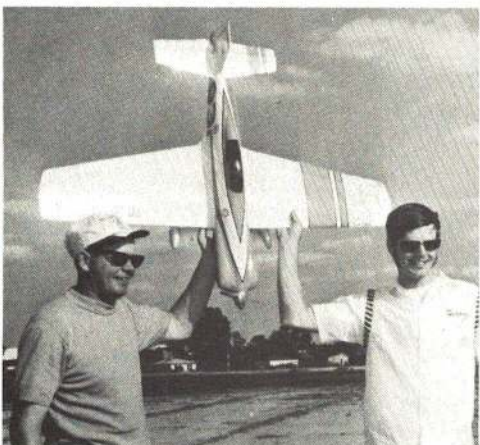


Left, new RC Champion Bob Smith—here with Undone II Pattern entry. Right, A Pattern entry by Hank Pohlmann was a modified Simco. Below, unusual FAI Pylon model flown by Adam Sattler was designed by Bill Zautner—named Platypus.



Above, Senior C Novice flyer Mark O'Connor. Ken Duncan assists with Triton. Left, special award in FAI Pylon for muffler effectiveness vs speed went to Joe Stream. He used the new Clary-Wisniewski .40 engine and muffler.

Left: Thanks again to the Hewlett-Packard Company for providing spectrum analyser monitoring equipment used in monitoring radio transmission. U.S. Navy photo.



Left: The winning Formula I Pylon Racer held aloft by pilot Terry Prather (R) and caller, Alvin Prather, Terry's dad. Model is the Stafford Minnow. Right: Bob Violett (L) and Cliff Telford finish fueling their winning FAI Pylon Racer. Model has retract, PB fuselage, original wing and stab, Supertigre engine.



Ron Chidgey's winning C Pattern Expert model was his familiar Tiger Tail design. Power was a muffled Webra 61, Top Flite 11-8 prop.

RADIO CONTROL

C PATTERN QUALIFYING-EXPERT

Jr.-Sr.-Op.	Points
1. Norm Page	474
2. Ron Chidgey	472
3. Ralph Brooke	465
4. Jim Martin	459
5. Jim Edwards	458
6. Jim Kirkland	454
7. Lewis Penrod	447
8. Jim Whitley	446
9. Joe Bridi	444
10. Don Coleman	443
11. Larry Leonard	436
12. Ted White	435
13. Bill Salkowski	435
14. Jim Agee	433
15. Phil Kraft	431
16. Doug Spreng	429
17. Jim Oddino	429
18. Tony Bonetti	428
19. George Hill	422
20. Bob Smith	421

C PATTERN

FINALS-EXPERT

Jr.-Sr.-Op.	Points
1. Ron Chidgey	835
2. Don Coleman	826
3. Jim Martin	825
4. Norm Page	819
5. Jim Kirkland	816
6. Phil Kraft	814
7. Ralph Brooke	800
8. James Edwards	797
9. Ted White	790
10. Jim Whitley	785
11. Tony Bogetti	783
12. Bill Salkowski	781
13. Lewis Penrod	775
14. Larry Leonard	773
15. Joe Bridi	773
16. John Agee	766
17. Jim Oddino	753
18. Doug Spreng	743
19. George Hill	731
20. Bob Smith	721
Best Senior	Bob Smith

C PATTERN-NOVICE

Jr.-Sr.-Op.	Points
1. Carl Weber	400
2. George Buso	392
3. T. Meisheimer	391
4. Tom Atkins	387
5. Adam Sattler	382

Best Junior

James Hiller

Best Senior

Mark Radcliff

B PATTERN

Jr.-Sr.-Op.	Points
1. P. Giesekeing	405
2. Kim Johnson	399
3. James Duda	388
4. Terry Edmonds	384
5. J. Dornberger	384

Best Junior

Jon Stamm

Best Senior

Kim Johnson

A PATTERN

Jr.-Sr.-Op.	Points
1. Charles Shade	311
2. M. Murray	295
3. Joe Hildreth	292
4. James Maki	290
5. C. Kenney	280

Best Junior

Van Johnson

Best Senior

Eric Meyers

PYLON FORMULA I

Jr.-Sr.-Op.	Points
1. Terry Prather	20
2. Telford/Violett	19
3. Korpi/Roy	18
4. Bob Smith	17
5. Thomas Baker	14
Jim Stegall	14

Best Senior

Bob Smith

PYLON FAI

Jr.-Sr.-Op.	Points
1. Telford/Violett	23
2. Bob Smith	22
3. Terry Prather	17
4. Chuck Smith	15
5. Robert Noll	14
Jeff Bertken	14
Harold DeBolt	14

Best Senior

Bob Smith

PRESIDENT'S MEMO

GREATEST "NATS" EVER. With the superb cooperation of the United States Navy, the Academy of Model Aeronautics has co-sponsored the GREATEST "NATS" IN HISTORY.

Over 1,200 entrants competed for over 500 trophies and awards in the finest spirit of sportsmanship. And there were more than 400 Mechanics for a grand total of almost 1,700 AMA member registrants.

NAVY HOSTMANSHIP. The entire facilities of Glenview Naval Air Station, under the command of Captain William Dykman, were thrown open in warm welcome for the week of championship competition. The Navy's men, to the very last of them, went all out in their effort to provide every service at their disposal, always asking if there wasn't something else they could do. What Hosts!

"CAN-DO" NAVY. It takes a great command and excellent personnel to absorb the total disruption of shutting down a station's normal activity and setting up for an operation they know little about. The "Can-Do" Navy did it so smoothly that it must have looked to the 1264 contestants like they did this all the time.

The secret of success for the Nationals is a one week "happy marriage" between two great groups of improvisors, the Navy and AMA—the modeling "know-how" of AMA, and the "can-do" of the Navy.



AMA President John Clemens having his identification badge photo taken during the Nats. Concession provided on-spot badges and bolstered Nats income. U.S. Navy photo.

CONTESTANT SPIRIT. Paralleling the fine Navy spirit was a remarkably refreshing spirit of cooperation on the part of the contestants. There was more courtesy, more friendliness, more cooperation for our host, the Navy, in keeping things clean and picked-up, and more cooperation with each other. Notable was the increase in family participation, encouraged by the providing of tenting and camper facilities by the Navy. A spirit of kinship and sportsmanship seemed to be everywhere.

EXCELLENT OFFICIATING. AMA's group of over 100 "Nats" officials, under the organizing leadership of the Nats Executive Committee, handled this largest of meets so smoothly that it must go down as the "most fun" meet ever. We have wonderful leaders!

"NATS" SUMMARY. Superb hostmanship from the Navy—excellent dignified sportsmanship on the part of the contestants—similarly skillful and thoughtful officiating on the part of AMA's officials.

As president of the Academy of Model Aeronautics I salute these three groups of fine Americans, cooperating and conducting themselves in the fine American spirit!

*John Clemens
AMA President*

SCALE

RADIO CONTROL

Jr.-Sr.-Op.	Points
1. Maxey Hester	22579
Ryan STA	
2. Bob Wischer	19241
Douglas M2 Mailplane	
3. John Roth	18333
Volkplane	
4. Ed Ellis	18102
Spirit of St. Louis	
5. Ralph Jackson	17096
Handley Page 0/400	

Flight Achievement

Ralph Jackson	
Best Junior	
Jim Hiller	
Best Senior	
Bill Hiller	

3. Wm. Shailor	118.5
4. Michael Kuehne	118.0
5. Paul Tobie	105.0

Open

1. B. Servaites	176.375
2. C. Markos	159.750
3. C. Sotich	159.375
4. Fred Stark	153.000
5. R. Martelet	148.500

CONTROL LINE

Junior	Points
1. C. Burnstine	395
B-26	
2. Darrin Mathews	250
Volkplane	
3. Mark Bauer	177
S.E. 5	
4. John Whitsitt	150
P-51-D	

Senior

1. John Glab	399
P-51-B	
2. Tom Pecorilla	297
S.E. 5A	
3. Bill O'Connor	258
F-82	
4. R. Braekvelt	224
Fokker D-VII	
5. G. Schemmel	201
Apache	

Open

1. Malvin Meador	517
Spitfire Mk IIA	
2. R. Burnstine	502
Mohawk	
3. Mike Stott	479
Ryan STA	
4. E. Violet Jr.	457
Kaydet	
5. V.A. Sheber	453
Chipmunk	



Bob Talchik captured the Scale Category Championship this year, the first time it was offered. He flew Miles Magisters in CL (shown) and RC.

OUTDOOR FREE FLIGHT

Jr.-Sr.	Points
1. Brian Webster	227
DeHavaland-4	
2. Michael Kuehne	182
Pietenpol Air Camper	
3. Rebecca Stark	136
Fairchild 24	
4. Laurie Stark	90
Cessna 01E Bird Dog	
5. Pat Wood	81
Douglas Sky Raider	

Open

1. Frederick Stark	476
Loening M-8	
2. Ron Martelet	412
Bristol MID	
3. Rudolph Stab	383
Pietenpol Air Camper	
4. Ralph Kuenz	349
Folkerts SK-2	
5. Richard Wetzel	288
Bucker BU133	

INDOOR

Junior

1. Gregory Simon	121.5
2. S. Wisniewski	93.0
3. Barry Pallet	92.0
4. Bruce Pallet	88.0
5. Patrick Wood	80.0

Senior

1. M. Kummerow	138.5
2. Brian Webster	119.0



Above Left, Open CL Scale winner was Malvin Meador whose model was a Spitfire Mk IIA. His static scale score was also higher than any other Scale model which made an official flight (all categories considered), and thus he received the Sterling Models Award consisting of a handsome plaque and \$100 check. Above R, RC Scale winner Maxey Hester getting set with his Ryan STA. Right, Indoor Scale model flown by Ed Fort was the Lewis & Vought VE 7. The 22" span model weighs one ounce less rubber.



FF Scale winner Frederick Stark. Model is the Loening M-8, 35" span, Cox .049.

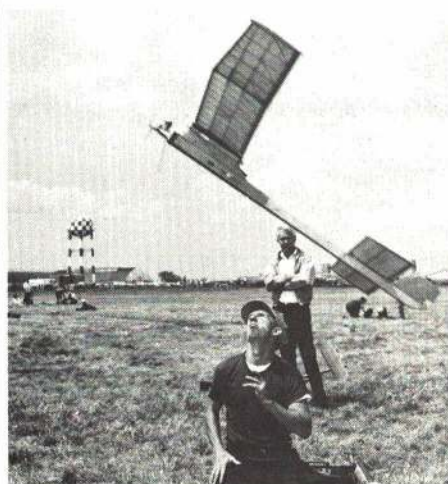




Senior National Champ Brian Webster won FAI Power with Supertigre 15-powered original. Mono-Koted, pacifier pressure tank, Top Flite 7-4 prop.



Known mostly for CL flying, Jr. National Champ Brian Pardue also did well in Free Flight, both indoor and outdoor. Coupe D'Hiver Rubber shown.



Left, Frank Wolff's hot FF gassie on the way up. Wolff was 1971 Free Flight Category Champion. Right: In the background is Jean Sheffer from Biloxi, Miss., one of nearly 50 volunteers who helped on busy HL day. Henry Harris with HL.



Left, interesting Class A design by Rudolph Stab is elliptical in both planform and dihedral. Uses Torp 19 power. Right, Dave Kerzie launches A-2 Talon for son, Dave, who placed second in Junior. Towline event is very popular.



FREE FLIGHT— OUTDOOR

1/2 A GAS

Junior	Seconds
1. L. McFarland	1080
2. M. Lapsie	832
3. F. Johnson	685
4. Kevin Hayes	658
5. Gerald Cain	631

Senior	Seconds
1. C. Apprendi	683
2. Paul Tobie	660
3. R. Lyons, Jr.	640
4. Grady Turner	630
5. Denny Dock	537

Open	Seconds
1. Don Chancey	1179
2. R. Anderson	1168
3. N.A. Pitas	1156
4. Mel Schmidt	952
5. Sal Taibi	828

A GAS

Junior	Seconds
1. G. Comp, Jr.	535
2. G.J. Simon	522
3. F.A. Johnson	512
4. Brian Pardue	503
5. Barry Pallet	488

Senior	Seconds
1. Robert Hallum	900
2. C. Apprendi	886
3. Paul Tobie	720
4. Greg Fortin	661
5. B. Johnson, Jr.	540

Open	Seconds
1. Eugene Wald	1242
2. John Carls	1200
3. James McNeill	1142
4. Andy George	1070
5. John Nix, Jr.	882

B GAS

Junior	Seconds
1. Kevin Hayes	489
2. Jeffrey Nix	448
3. Wm. Schlarb, Jr.	432
4. L. McFarland	312
5. Wayne Frieblis	180

Senior	Seconds
1. Marty Thompson	1035
2. Brian Webster	574
3. Bruce Hannah	496
4. Robert Hallum	465
5. Mark Kummerow	457

Open	Seconds
1. Jim Clem	1020
2. Willard Smitz	1018
3. Michael Fedor	995
4. Charles Harper	720
5. Mel Schmidt	682

C GAS

Junior	Seconds
1. R. Wegener	900
2. Kevin Hayes	527
3. L. McFarland	485
4. Wayne Frieblis	329
5. D. Gardner	180

Senior	Seconds
1. Robert Hallum	809
2. Pat McGhehe	648
3. M. Kummerow	446
4. R. Hanford	437
5. Greg Fortin	386

Open	Seconds
1. Eddie Thomas	720
2. Robert Watson	676
3. Frank Wolff	659
4. Gilbert Robbins	538
5. H.E. Heminger	533

FAI POWER

Junior	Seconds
1. G. Geraghty	750
2. D. Gardner	527
3. W. Schlarb, Jr.	509
4. D.B. Mathews	324
5. Wayne Frieblis	320

Senior	Seconds
1. Brian Webster	824
2. L.L. Cleveland	686
3. Wm. Reuter	598
4. Carolyn Kloth	530
5. Jim Haught	503

Open	Seconds
1. D. Rounsaville	866
2. James Kloth	819
3. J. Robinson	796
H. Brodersen	796
4. Frank Wolff	794
5. R. Shakespeare	782

ROCKET POWER

Junior	Seconds
1. Charanne Moore	296
2. R.J. Lyons	180
3. Gregory Simon	143
4. Kurt Burner	139
5. Wm. Schlarb, Jr.	127

Senior	Seconds
1. Denny Dock	291
2. Wm. Reuter	237
3. J. Lorbiecki	121
G. Pharr IV	115
5. Rod Wilson	63

Open	Seconds
1. George Lewis	378
2. Ronald Evans	340
3. Dale Wilson	332
4. F. Iannuzzo	310
5. Jackie Sheffer	263

HELICOPTER

Jr.-Sr.-Op.	Points
1. Wm. Ellerman	142.85
2. Glenn Lee	140.55
3. D.L. Taylor	139.25
4. T. Naccarato	131.15
5. R. Wetzel	30.60

WAKEFIELD RUBBER

Junior	Seconds
1. Keith Gordey	492
2. D.B. Mathews	431
3. G. Geraghty	178

4. Wm. Schlarb, Jr.	102
5. David Wypych	77

Senior	Seconds
1. R. Dunham II	765
2. Peter Lewis	722
3. Gary Heeb	660
4. R. Hanford	653
5. Jeff Annis	544

Open	Seconds
1. Peter Allnutt	1577
2. Andy DeMello	1193
3. Dale Wilson	890
4. Mel Schmidt	884
5. Paul Crowley	843

COUPE D'HIVER RUB.

Jr.-Sr.	Seconds
1. Paul Tobie	568
2. Paul Ryan	448
3. R. Hanford	445
4. Richard Persh	394
5. David Schmidt	391

Open	Seconds
1. Michael Fedor	769
2. Mel Schmidt	572
3. M. Richardson	570
4. R.J. Sherman	565
5. Dale Wilson	550

UNLIMITED RUBBER

Junior	Seconds
1. G. Geraghty	663
2. Fritz Curth	433
3. S. Matteson	422
4. Jon Watson	418
5. Gregory Simon	417

Senior	Seconds
1. R. Dunham II	1217
2. Gary Heeb	532
3. M. Thompson	518
4. Peter Lewis	447
5. Jeff Annis	371

Open	Seconds
1. R. Sifleet	1365
2. Willard Smitz	900
3. Peter Allnutt	870
4. P. Klintworth	535
5. Joseph Macay	517

NORDIC GLIDER

A-1 Junior	Seconds
1. Jeffrey Nix	590
2. Mark Munger	520
3. Robert Hayes	510
4. Barry Pallet	377
5. F.A. Johnson	258

A-2 Junior	Seconds
1. D.B. Mathews	690
2. Michael Kerzie	521
3. David Uthoff	462
4. G. Geraghty	433
5. Bryan Baetens	373

A-1/A-2 Senior	Seconds
1. R. Hanford	768
2. Jim Haught	675
3. Glen Winkel	673
4. Bruce Hannah	634
5. J. Lorbiecki	621

A-1/A-2 Open	Seconds
1. Frank Wolff	1080
2. Paul Kosmala	900
3. P. Klintworth	845
4. Don Chancey	830
5. Ronald Evans	776

H.L. GLIDER

Junior	Seconds
1. J. Kirkendall	265
2. David Uthoff	221
3. G. Comp, Jr.	214
4. L. McFarland	208
5. Robert Hayes	177

Senior	Seconds
1. Douglas Adams	309
2. R. Hanford	287
3. Charles Wiese	276
4. Larry Reimer	256
5. James Mills	253

Open	Seconds
1. Richard Mathis	340
2. Lee Campbell	338
3. Donald Wright	324
4. Robert Pione	306
5. Kenneth Phair	296

INDOOR

CABIN

Junior	Time
1. Gregory Simon	11:41.8
2. Barry Pallet	6:35.0
3. Patrick Wood	5:35.0
4. Wm. Schlarb	4:33.8
5. Bruce Pallet	3:38.4

Senior	Time
1. Ronald Ganer	15:23.0
2. Tom Sova	14:57.0
3. R. Dunham II	11:20.0
4. M. Kuehne	9:26.4
5. Michael Wood	4:36.2

Open	Time
1. R.J. Plotzke	23:03.6
2. Al Rohrbaugh	21:58.0
3. J. Richmond	21:37.2
4. R. Randolph	20:27.2
5. Wayne Zink	18:57.4

STICK

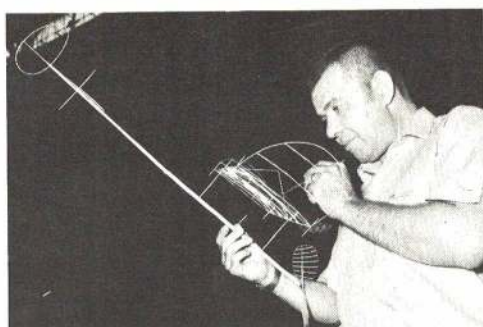
Junior	Time
1. G. Geraghty	15:43.0
2. G.J. Simon	13:12.4
3. Bryan Baetens	10:07.0
4. Patrick Wood	9:43.2
5. Wm. Schlarb	8:54.2

Senior	Time
1. Ronald Ganer	24:19.0
2. R. Dunham II	18:41.4
3. Tom Sova	18:31.8
4. Dale Hacker	14:41.6
5. Wm. Shailor	14:11.3

Open	Time
1. J. Richmond	33:54.0
2. R. Plotzke	29:43.4
3. Edward Stoll	27:25.0
4. C. Sotich	27:04.0
5. Dan Belieff	26:49.0

PAPER STICK

Junior	Time
1. Gregory Simon	13:05.6
2. G. Geraghty	10:58.2
3. Bryan Baetens	9:55.4
4. Bruce Pallet	9:29.4
5. Barry Pallet	8:48.8



Senior	Time
1. Tom Sova	17:10.4
2. R. Dunham II	13:23.6
3. Ronald Ganer	12:40.6
4. Wm. Shailor	11:17.2
5. Jim Haught	10:47.6

Open	Time
1. J. Richmond	21:37.0
2. Edward Stoll	19:32.0
3. H. Brodersen	19:18.0
4. Al Rohrbaugh	19:04.6
5. L. Gailliau	18:04.0

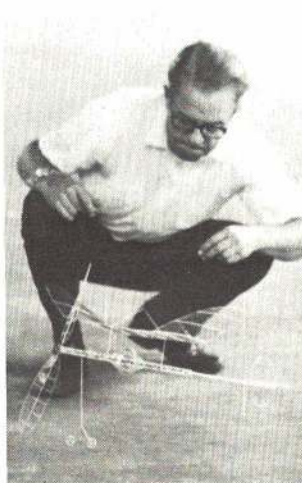
H.L. Glider

Junior	Seconds
1. G. Geraghty	109.8
2. Brian Pardue	99.2
3. Robert Hayes	97.8
4. Gregory Simon	95.4
5. Wm. Schlarb	84.0

Senior	Seconds
1. Marty Thompson	127.2
2. R. Dunham II	124.4
3. G.M. Pharr IV	115.8
4. Peter Lewis	105.4
Lee Cleveland	105.4
5. R.J. Ganer	105.0

Open	Seconds
1. Rudy Kluiber	124.2
2. Bucky Servaites	121.2
3. V. Cunningham	119.6
4. Terry Kuehne	116.6
5. R. Hanford	114.4

Left: Fine craftsmanship obvious in Ron Plotzke's Stick model with which he placed second in Open. U.S. Navy photo. Right: Jim Richmond won Indoor Category Championship for third straight year, a real master. Stick model shown.



Left, ROG Cabin takeoff by Al Rohrbaugh. He placed second in Open. Right, sanding Indoor HL Glider to increase performance is George Pharr IV—Senior 3rd place. U.S. Navy photo. New scheme alternated HL test and official periods.

NATS (Continued from page 57)

By contrast Free Flight Flying Scale, which traditionally has suffered from breezy weather, got almost ideal conditions on Nats Thursday; many excellent flights resulted. Similarly, RC Scale had two perfect days on Friday and Saturday, and Control Line Scale shared the luck when also flown on Saturday.

This was a great year for Scale—one hundred and ninety-seven entries! Control Line had 46, Indoor had 53, Radio Control had 34, and Outdoor Free Flight had a phenomenal 64. In addition there were huge scale-related events such as CL Scale Racing (Goodyear) with 138 entries and RC Formula I with 81. It's obvious—everybody loves Scale.

Appropriately, the 1972 U.S. Scale Teams were selected at this Nats. Making the team for RC was Maxey Hester, Bob Wischer, and John Roth. In Control Line it was Malvin Meador, Ralph Burnstine, and Mike Stott. Only Hester made it from among the 1970 team members competing at the Nats. Hale Wallace (RC) and Andy Sheber (CL) had crashes which knocked them out of contention.

Walt Moucha, the popular favorite to repeat getting on the team, chose to enter his 1970 World Championships entry (4th place) rather than his newer model, a gorgeous Curtiss Jenny which had already won several best-of-show awards. Despite many flights (most RC Scale entrants had six chances to fly) Walt could not get the flight points he needed.

Meanwhile, inside of a hangar, an incredible series of flights was being made; never before seen at a Nats. Dave Gray, of Mundelein, Ill., flew his RC helicopter for the public every hour on the hour during Saturday and several times on Sunday. Most of the time he used a space no larger than a living room!

He flew in every direction, including backwards, made many spot landings, the model always under perfect control. The performance earned Dave a Special RC Award and generated much discussion to the effect that the RC helicopter had at last come of age and that a competition event was surely to be developed quickly.

Earlier in the week, some miles away from the naval air station, RC Gliders flew in an "unofficial" Nats competition with about fifty entrants. The top three winners earned a place on the U.S. RC Soaring Team to compete in International Class meet to be held in September in conjunction with the RC Aerobatics World Championships in Pennsylvania.

At Glenview the U.S. RC Pylon Racing team was similarly selected from among the winners of the FAI Pylon event. Forty-eight entrants registered for this event which had never before been held at the Nats. For the first time ever at a Nats, or at any competition, sound measurements were made of all FAI Pylon entries. The event ran smoothly despite some controversy over processing. Adding interest too were special awards for muffler effectiveness. Several simple and clever muffler designs were recognized, and it

appears that definite improvements in the state of the art resulted from this Nats competition.

In the meantime the RC Contest Board met at the Nats and voted to require mufflers for all pattern competition rather than just for the Class D (FAI) event. These developments, and much general discussion at the Nats, at least among the RC fraternity, seem to predict that mufflers will become increasingly evident before long. The trend is expected to be pushed even further when the results of the FAI RC Pylon event sound level measurements are published.

A study of the '71 Nats statistics, together with the listings of event winners, will indicate many other details of what went on at Glenview Naval Air Station this year, as will other articles in this and other magazines. The photo captions also help to tell the story. But much went on behind the scenes that statistics, listings and even photos don't describe.

This was, for example, a Nats unprecedented in the spirit of Navy support. Although many previous nats produced glowing reports of Navy efforts, the '71 Nats situation deserves special mention. The fact is that this Nats was hampered from the beginning by shortages of personnel, limited facilities, and severe restrictions on operating conditions. Despite this, the Navy spirit was clearly superior to many previous Nats.

Captain Bill Dyckman, Commanding Officer, and his Executive Officer, Captain Paul Merchant, made it plain to AMA officials that although Navy help was seriously com-

promised in relation to the past, this Nats would get the maximum in spirit and co-operation. The Navy effort, led by the Nats Project Officer, Commander Walter M. Servis, proved to be enthusiastic and cheerful.

Time after time in situations where men and materials were lacking, Navy officers found ways to solve the problems and keep the meet moving. Servis, affectionately proclaimed as the Great Seaweed, and his staff—most of whom were veterans from the '70 meet—continually asked throughout the meet what more could be done, even though it was obvious that they were straining all resources available.

There was more AMA-Navy teamwork than ever before. AMA took on the effort and expense of providing tents, work tables, some of the meet gear repair work, and more manpower. A special effort was also made to reduce pre-meet workloads by scheduling fewer advance AMA-Navy meetings and delaying Nats work until immediately prior to Nats week. As a result the Navy was able to continue military training schedules almost without interruption right up to the weekend before—the airfield was actually undergoing final stages of meet preparation as contestants were registering on Nats Monday.

By the end of Nats Tuesday—the eve of full schedule competition from Wednesday through Sunday—two days of Indoor flying, two days of RC Pylon qualifications, three days of RC Glider flying, and one day of Free Flight and Control Line test flying had been

completed as had the largest Nats registration of all time.

Much more needs to be told of the '71 Nats and will be when more space is available. One big story will be the Navy's side of the Nats; another will be the story of the AMA people behind the Nats. The world's biggest model meet doesn't just happen each year, and this year it was close to not happening at all. But for now the '71 Nats is in the record books as one of the best in the 24 consecutive years of Navy hosting and the biggest ever since the Nats began in 1923.

This was the 40th Nats, with roots back before the Navy joined the program in 1948, and even before the Academy of Model Aeronautics was born in 1936. In those earlier days the National Aeronautic Association—AMA's parent organization—promoted model aviation. NAA still does, and its current executive director, General Brooke Allen (USAF, retired) was on hand at the '71 Nats to provide encouragement and congratulations.

Current Navy indications are that we'll go again with the Nats next year in Glenview. There were many economic and logistic benefits to repeating the Nats at the same station. The savings in manpower training, equipment preparation, and in operational procedures appear to have made it possible for the Navy to continue hosting the Nats, at least for another year.

Poetically speaking the outlook seems to be: See You, in Seventy-Two, at Glenview!

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

OCT. 2-3—VAN NUYS, CALIF. (AA) 22nd Annual FF, CL & RC Scale Contest. Site: Van Nuys (Basin). C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: N.A.R. Flightmasters.

OCT. 2-3—ROCHESTER, N.Y. (A) United Pylon Racing Circuit RC Championships. Site: Rochester. R. Walder CD, 129 Westmoreland, Rochester, N.Y. 14620. Sponsor: Radio Control Club of Rochester.

OCT. 2-3—OCALA, FLA. (AAA) Hurricane FF & CL Meet for Cat. II. Site: Dunnellon Airport. J. Krutz CD, 76 Kenilworth Ave., Ormond Beach, Fla. 32074.

OCT. 3—ROWLEY, MASS. 1971 Cape Ann Fly-For-Fun Meet. Site: Cape Ann RC Site. R. Gaertner CD, 9 Brookbridge Rd., Peabody, Mass. 01960. Sponsor: Cape Ann RC Model Club.

OCT. 3—DAYTON, OHIO (AA) Cold Cash Bash CL Meet. Site: Municipal Model Airport. H. Roe CD, 165 Broadripple Rd., Centerville, Ohio 45459. Sponsor: Dayton Buzzin' Buzzards.

OCT. 3—DETROIT, MICH. (AA) Great Lake Fall CL Internats. Site: Rouge Park. J. Lucas CD, 20463 Ardmore, Detroit, Mich. 48235. Sponsor: Strathmoor Model Club.

OCT. 3—LAKEHURST, N.J. (AA) Central Jersey RC Club Eastern States RC Meet. Site: Lakehurst N.A.S. L. Shulman CD, 42 Blake Ave., Cranford, N.J. 07016. Sponsor: Central Jersey RC Club.

OCT. 3—MANSASSAS, VA. (AA) Maxcutters Fall FF Meet. Site: Mansassas. J. Thornhill CD, Box 85A, RFD 1, Mt. Airy, Md. 21771. Sponsor: D. C. Maxcutters.

OCT. 3—MENTOR, OHIO Quarter Midget RC Third World Championships. Site: MARCS Field, Tyler Blvd. R. Penko CD 21151 Westport Ave., Euclid, Ohio 44123.

OCT. 3—VAN NUYS, CALIF. (AA) Valley Circle Burners O. CL Meet. Site: L.A. Model Airport. W. Cohen CD, 7323 Amestoy Ave., Van Nuys, Calif. 91406.

OCT. 3—BONG FIELD, WISC. (B) Pelican Annual N.J.A.M.A.C. FF Meet for Cat. II. Site: Bong Field. R. Elman CD, 17707 Burn-

ham, Lansing, Ill. 60438. Sponsor: Pelican Model Airplane Club.

OCT. 3—NASHVILLE, TENN. 1/4 Midget Race Rally. Site: Nashville. B. Reuther CD, 6602 Highway 100, Nashville, Tenn. 37205. Sponsor: Middle Tennessee Radio Control Society.

OCT. 3—REEDSVILLE, PENNA. State College RC Fun Fly. Site: Mifflin County Airport. A. Niessner, Jr. CD, RD 1, Box 398, Boalsburg, Penna. 16827. Sponsor: State College Radio Control Club.

OCT. 3—MYSTIC, CONN. (AA) SCAMA Sweepstakes FF Meet. Site: Lantern Hill. H. Struck CD, RFD 2, Lyme, Conn. 06371. Sponsor: Southern Connecticut Aero Modeling Assn.

OCT. 9-10—LAS VEGAS, NEV. (AA) L.V.R.C. Annual RC Meet. Site: Mint Gun Club. G. Horstman CD, 613 Donner, Las Vegas, Nev. 89107.

OCT. 9-10—GALEVILLE, N.Y. (AA) Sky-Scrapers International FF Challenge. Site: AA Field. W. Dunwoody CD, 985 Ft. Salonga Rd., Northport, N.Y. 11768. Sponsor: Sky-Scrapers.

OCT. 9-10—SUFFIELD, CONN. (AA) NCRCC RC Pattern & Scale Meet. Site: NCRCC Field. S. Griswold CD, Highland Ave., New Hartford, Conn. 06057. Sponsor: Northern Connecticut Radio Control Club.

OCT. 9-10—NEW ORLEANS, LA. (AA) 10th Annual Crescent City RC Meet. Site: Club Field. A. Wiltz CD, 3231 47th St., Metairie, La. 70001.

OCT. 9-10—ALBUQUERQUE, N.M. (AA) SWAT Fall FF Contest. Site: Boy's Academy. B. Averill CD, 2314 Palomas NE, Albuquerque, N.M. Sponsor: South West Aero Team.

OCT. 9-10—CHARLESTON, W.V. (AA) Third Annual Area III RC Championships. Site: Charleston. S. Sturm CD, Box 5234, Vienna, W.V. 26101. Sponsor: Mountaineer Radio Control Club.

OCT. 10—ROCKFORD, ILL. (AA) F.V.M.A.A. Super "AA" CL Bash. Site: Riverdahl Park. B. Vojslavek CD, 7819 Chestnut Ave., Woodbridge, Ill. 60515.

OCT. 10—READINGTON, N.J. "Antique Antics" RC Antique Meet. Site: Solberg Airport. C. Gill CD, 835 Gilbride Rd., Martinsville, N.J. 08836.

OCT 10—RICHMOND, VA. (AA) Brainbusters Fall FF Meet. Site: Curles Neck Farm.

A. VanDover CD, 112 Tillerson Dr., Newport News, Va. 23602. Sponsor: Hampton Brainbusters.

OCT. 10—PORTLAND, IND. (AA) Fall FF Fly-In. Site: Portland. R. Plone CD, 10340 Southwind Dr., Cincinnati, Ohio 35677. Sponsor: Southwestern Ohio FF'ers.

OCT 16—PHOENIX, ARIZ. (AAA) Arizona State FF & RC Championships. Site: Phoenix. W. Roseberry CD, 4922 W. LaMar Rd., Glendale, Ariz. 85301.

OCT. 16—VICTORIA, TEX. (A) South Texas All Scale R.G. RC Championships. Site: G.C.R.C.A. Field. J. Daubenspeck CD, Box 281, Bishop, Tex. 78343. Sponsor: Gulf Coast Remote Control Assn.

OCT. 17—EAST MEADOW, N.Y. (AA) L.I.A.M.A.C. Outdoor FF & CL Championships. Site: Mitchell Field. J. Pallet CD, 30 Emerson Rd., Brookville, Glen Head, N.Y. 11545.

OCT. 17—CROOM, MD. (AA) Washington Area RC Tournament. Site: Croom Airport. T. Carey CD, 17900 Cliffbourne Ln., Derwood, Md. 20855. Sponsor: DC/RC, PG/RC.

OCT. 17—PHOENIX, ARIZ. (AA) 5th Annual CL Invitational Meet. Site: Pending J. Valenta CD, 3041 E. Shangri La Rd., Phoenix, Ariz. 85028. Sponsor: Air-Zona Model Airplane Club.

OCT. 24—SUFFIELD, CONN. (A) 3rd Annual RC Snow Goggle. Site: NCRCC Field.. H. Wainauski CD, 38 Alder Rd., Simsbury, Conn. 06070. Sponsor: Northern Connecticut Radio Control Club.

OCT. 30-31—OKLAHOMA CITY, OKLA. Oklahoma Model Hobbie Fair Meet. Site: State Fair Park. R. McGee CD, 508 W. Eubanks, Oklahoma City, Okla. 73118. Sponsor: T.O.R.K.S.

OCT. 31—KERMAN, CALIF. (A) Fresno Monthly FF Gas Meet for Cat. I. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

NOV. 7—ODESSA, TEX. Odessa Prop Busters RC Club Fun-Fly. Site: Prop Buster RC Park. S. Hood CD, 4110 E. 37th, Odessa, Tex. 79760. Sponsor: Odessa Prop Busters RC Club.

NOV. 13-14—TAFT, CALIF. (AAA) San Valeers Annual FF Meet. Site: Taft. H. Thompson CD, 24001 Archwood, Canoga Park, Calif. 91304. Sponsor: San Valeers.

NOV. 21—SACRAMENTO, CALIF. (AA) Northern Calif. FF Council FF Meet. Site: Weigel Field. R. Fallon CD, 2667 61st St., Sacramento, Calif. 95817. Sponsor: Stockton Gas Model Club.

NOV. 21—VAN NUYS, CALIF. Northrop Flying Wing 5th Annual Flying Wing Contest. Site: Sepulveda Basin. C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250.

NOV. 21—ROCKLEDGE, FLA. 4th Annual Scale RC Meet. Site: Club Flying Field. G. Jordan CD, Box 3331, Cocoa, Fla. 32922. Sponsor: Spaceport RC'ers.

NOV. 28—KERMAN, CALIF. (A) Fresno Monthly FF Gas Meet (Cat. I). Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

NOV. 28—VAN NUYS, CALIF. 3rd Annual "Jumbo Rubber Scale" Meet. Site: Van Nuys (Basin). C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: N.A.R. Flightmasters.

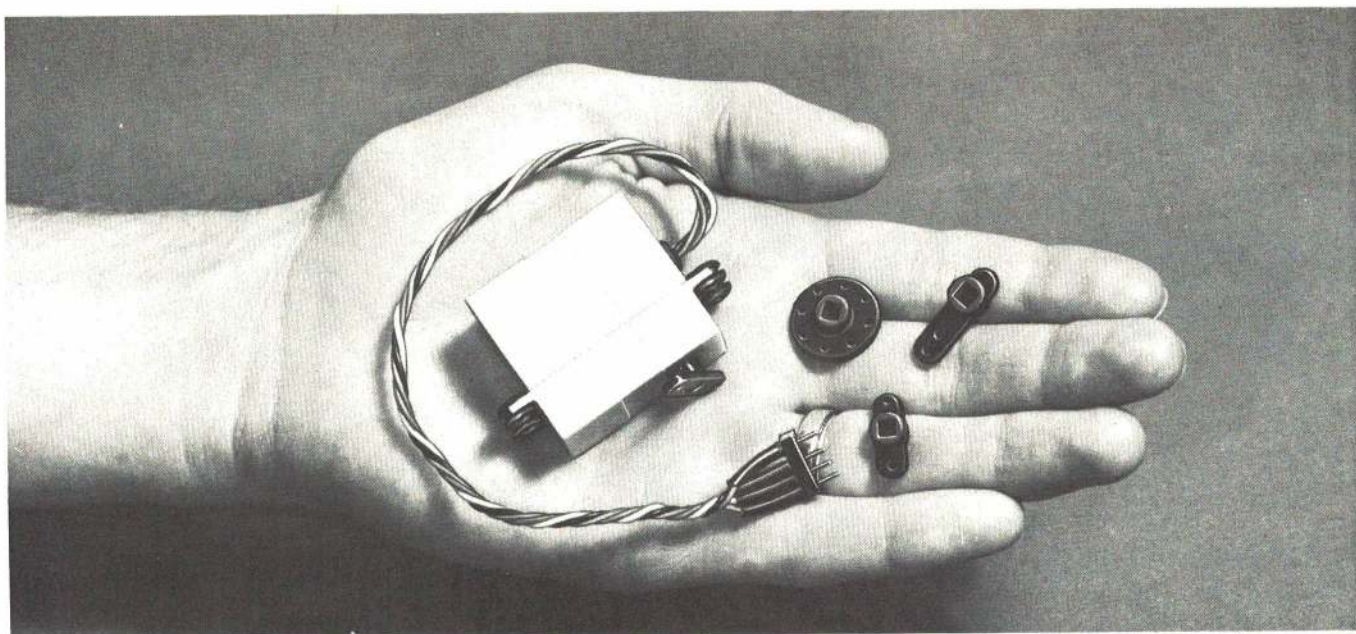
DEC. 26—KERMAN, CALIF. (A) Fresno Monthly FF Gas Meet (Cat. I). Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

DEC. 26-28—TUCSON, ARIZ. (AA) 1971 Winter RC Nationals. Site: Marana Air Park. R. Angus CD, 6640 N. Columbus, Tucson, Ariz. 85718. Sponsor: Tucson Radio Control Club.

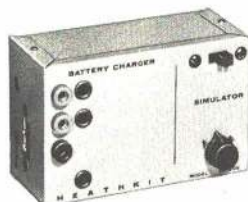
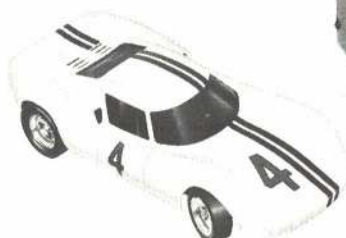
DEC. 31-JAN. 1-2-3—WINTER PARK, FLA. (AA) Tangerine International RC Championships. Site: R.C.A.C.F. Field. W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789.

AMA OFFICER DIRECTORY

The most recent complete directory was published in the October AAM, page 64.



1 1/4 ounces, 3-pound punch!



New Heathkit Sub-Miniature Digital Proportional Servo utilizes an integrated circuit to trim off excess bulk. The Sub-Mini weighs-in at 1.25 oz., measures 1 7/8" from mounting ear to mounting ear, yet provides the same 3-lb. thrust of much larger servos. Features include 90° rotation in 0.5 seconds; 1% position accuracy; ceramic variable control feedback element; nylon gears and molded nylon case. Just 18 components install quickly on printed circuit board. Includes 4 rotary outputs, is compatible with all Heath R/C Systems and most others. Measures 1 1/2" H x 3/32" W x 1 7/8" L.

Kit GDA-19-42, 1 lb. 24.95*

Heathkit Miniature IC Servo gives you digital circuitry, proportional control, in a package that weighs 30% less, is 25% smaller than conventional servos — but outperforms them with 4 lbs. of thrust. Includes both linear and rotary output assemblies, universal mounting ears. Weighs 1.75 oz., measures 1 5/8" H x 7/8" W x 2 1/2" L.

Kit GDA-19-41, 1 lb. 24.95*

Heathkit 5-Channel Systems include 4 servos; Heathkit Miniaturized Receiver; Slim Line Transmitter with Kraft sticks, built-in charging circuit; flat-pack nickel cadmium batteries & free soldering iron. Specify frequency desired.

System Kit GD-19S, with Sub-Miniature Servos for 12-oz. flying weight, 11 lbs. 224.95*

System Kit GD-19M, with Miniature IC Servos for 14-oz. flying weight, 11 lbs. 224.95*

System Kit GD-19, with standard servos for 16.6-oz. flying weight, 11 lbs. 199.95*

Low Cost 3-Channel Propo Rig includes 500 mW transmitter with trim controls, miniature receiver, flat-pack batteries, 2 standard servos, plugs, connectors, charging cord, free soldering iron.

System Kit GD-57, specify frequency, 8 lbs. 129.95*

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Kit GD-206, 2 lbs. 19.95*

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Kit GD-101, 11 lbs. 39.95*

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GX-232

HEATHKIT

Schlumberger

Schweizer 1-29 (continued from page 48)

Fine-sand the entire plane, using No. 200 sandpaper. Rub ordinary talcum powder into every square inch of surface to be doped. Put on a coat of clear and let it dry, sand it again and repeat the process.

Now for color. The real 1-29 was white with silver wings and red license numerals. (The numbers shown are scale.) You can paint your model in this manner if you want, but you have to decide between a flying model and a display model. The pigmented (colored) dope adds loads of weight, and more than two very thin coats (not enough for a good finish) will very likely warp and overload your ship beyond any hope of good performance.

The original model had only the two coats of clear, but a few details done in India ink

added quite a bit of realism. The moveable flying surfaces, the cockpit outline, and the word "experimental" were all done in ink, and the license numerals were cut from red tissue. The wheel was doped black.

Flying

The balance point must be in the area shown, even if you have to put an engine on the nose for weight. Sheet lead or type metal (from a printing shop) is great, but a couple of huge washers will work equally well. Hold weights in place with a rubber band or paper clip while trial balancing; when you find the right amount, glue it in place solidly.

For test flying, find an open grassy area about as large as the infield of a baseball diamond. Grip the fuselage firmly under the wing with thumb and forefinger, aim the nose into the wind and slightly down as though it were coming in for a long, smooth landing, and gently push the plane off. It should, of

course, make that long, smooth landing. Use empennage warping to cure any violent tendencies (elevators up for dives, down for stalls, and rudder opposite of any bad turns). You might leave a wide, gentle turn in the glide, to either the right or left, so you won't have to chase the ship across two counties every time it is launched.

Now for the real flying. There are two good methods of getting a plane this size airborne. Using a towline is the most popular, but it requires two people. Make the towline by attaching a paper clip to the end of about 100 ft. of kite string or light fishing line. A small cloth or paper flag tied about a foot in front of the paper clip helps the clip drop off the tow hook when you want it to, and makes the end of the towline easier to find after a flight.

To tow the plane up, have your helper hold it as for a hand glide, but with the nose slightly up, instead of down. Hook the paper clip onto the tow hook and stretch the line out to full length, straight into the wind. On signal, both of you begin running into the wind; when your helper feels the plane lifting, he lets it go gently. The secret of good towing is to keep your eye on the plane while running like a scalded demon. If the plane starts to veer sharply in either direction, let go of the string quickly and the plane will probably fly off of the hook and into a normal landing pattern. A good tow is right straight up the line, with very little weaving. The plane ought to stay hooked as long as you continue to pull, and disengage immediately when you let the line go slack. You may want to experiment with hook positions: an inch more forward improves tows in windy weather; an inch or so back for dead calm. Tow hook offset may improve the launch, too. For instance, if a plane consistently veers off to the left on the tow, putting the hook on the left side of the fuselage (instead of on the bottom, as plans show) may help to straighten the tow.

But suppose you have no helper? He can be replaced with about 50 ft. of 3/16" rubber (from any good hobby shop) and a small stake. Tie the rubber to the stake and to the front (upwind) end of the towline. You now have a huge, gentle slingshot. Hook the plane on, as in the towline method, and back up (stretch the rubber) twenty paces for a start. Launch the plane just as the helper does in the towline method, pulling it forward and up. Make all tow adjustments just as you would for towline. As the plane smoothes out and begins to perform well, increase the rubber tension (walk back further) for higher tows.

Your 1-29 ought to be performing like the real thing. Beware of thermals, those rising air currents on warm days that wait around patiently and invisibly, hoping to snatch free flights off to the Great Blue Gobbler in OOS. Put your name and address somewhere on the plane, just in case.



FLY THE WINNER*

*First place at 1970 World Scale Championships

***the 1970 world champion HIRTENBERGER**

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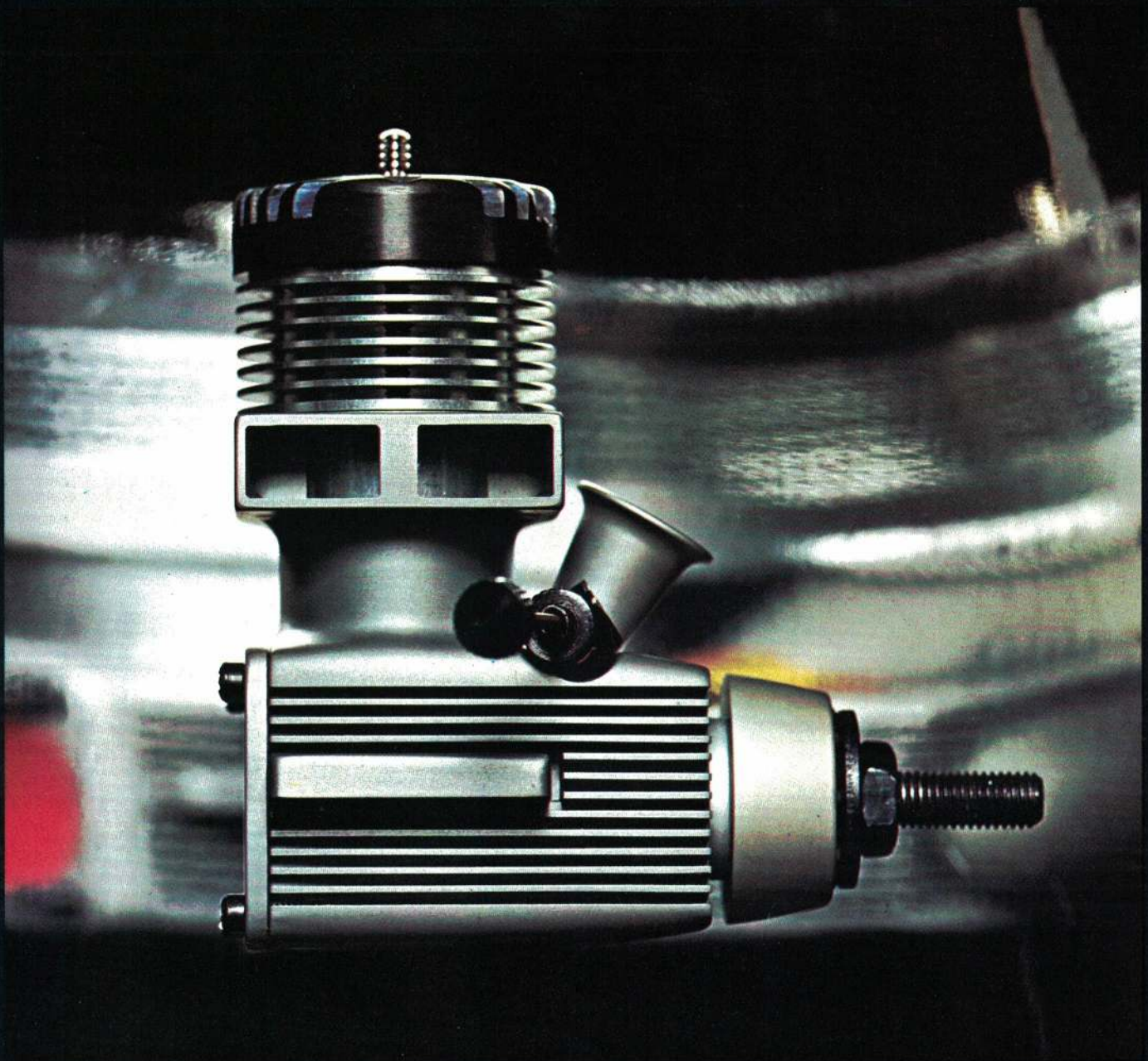
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TERRIFIC!...BUT LOOKS AREN'T EVERYTHING



The new Testors/McCoy Series 21 engine is so technically superior inside as well as handsome and functionally designed outside that you'll have to build that new plane just to try it out. The Series 21 comes in five sizes: .15, .19, .29, .35 and .40 cu. in.

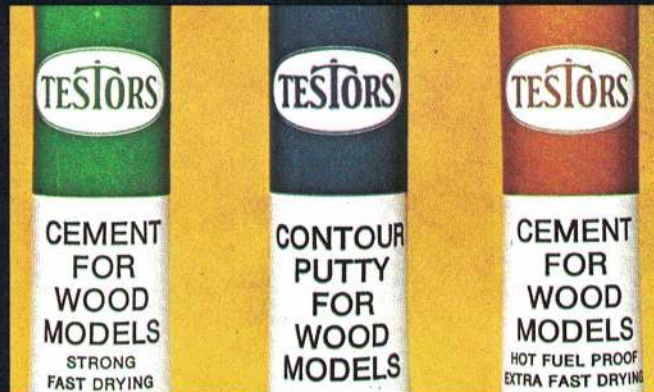
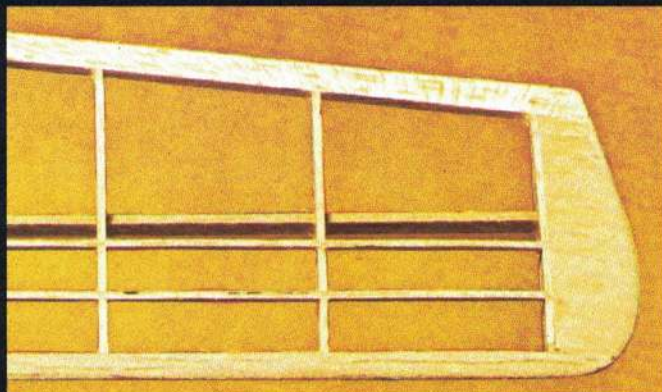
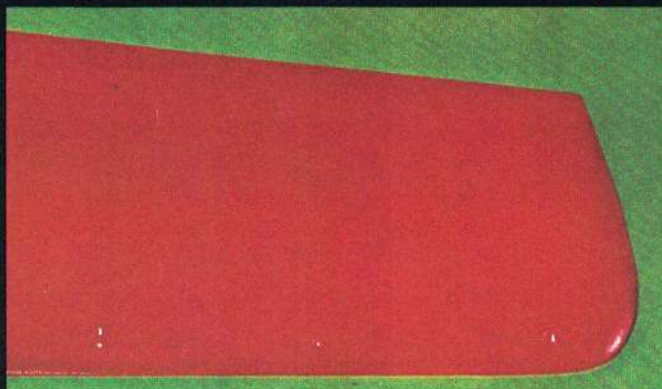
It is also available with the Perry carburetor for R/C flying. You can put your hands and eyes on it, as well as on detailed specifications, prices, etc., at your hobby/model dealer.

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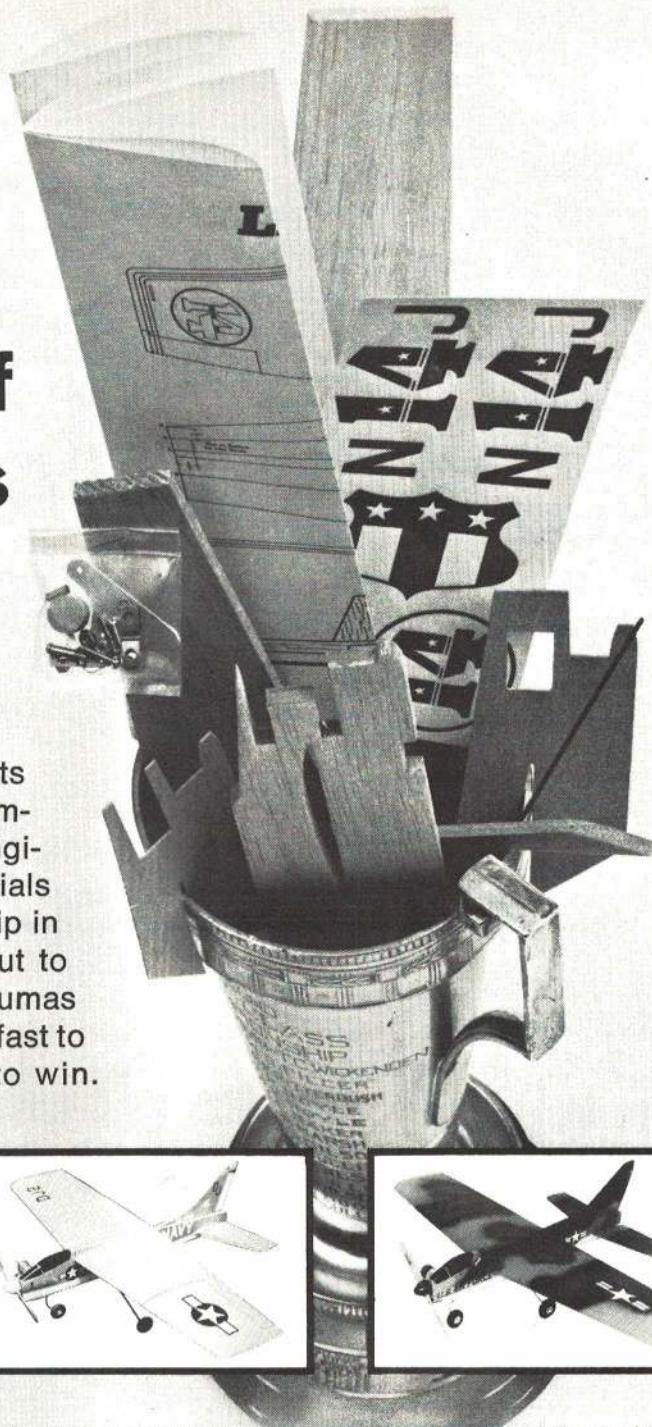
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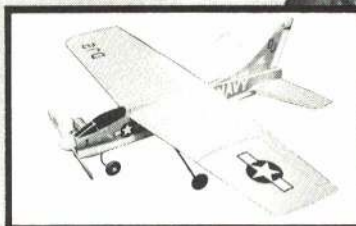
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Ole Tiger — At 90-plus mph, this .15 powered Goodyear Racer is riding high on competition victories. Solid balsa wing, tail and fuselage. Wing span 21". Kit C-31, \$8.50.

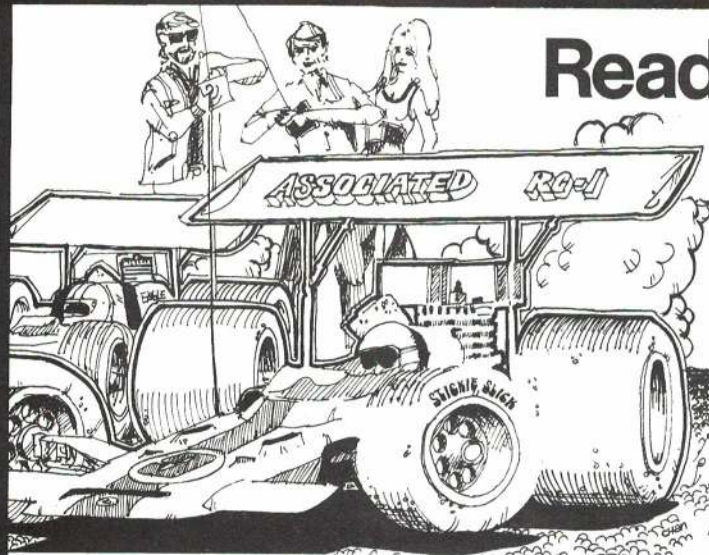
Mooney Cadet — This .049 trainer has a tricycle gear for easier takeoffs and landings. Twin rudders for greater control and line tension.

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**If you don't do it,
It won't get done**

Kingfisher

(continued from page 17)

OS2U-3's were even used as dive bombers.

But it was as a rescue craft that the Kingfisher made its name—by coming back one day with one of aviation's biggest names. World War I American ace-of-aces Capt. Eddie Rickenbacker and seven others crashed into the South Pacific in October, 1942, and were presumed lost. In the middle of November, almost three weeks later, all seven were picked up from their life rafts and returned to safety in two daring trips by a single Kingfisher. Rickenbacker and another man came back lashed to the wings as the overloaded airplane taxied 40 miles after

failing to get off the especially rough water.

The latest episode in the long history of the Vought scout, which should have ended many years ago, concerns one which crash-landed in western Canada while on a delivery flight to Alaska in the summer of 1942. Lost in heavy fog, it slammed into the side of a brush-covered mountain, suffering heavy damage but protecting its two-man crew. The story was forgotten (except by the two men, of course) until someone came across the remains of the plane in 1963. With the help of the Canadian Armed Forces, the pieces were eventually returned to the Vought Aeronautics Co. in Dallas, Tex.

Thirteen members of the company's Quarter Century Club, many of whom had helped build Kingfishers during the war,

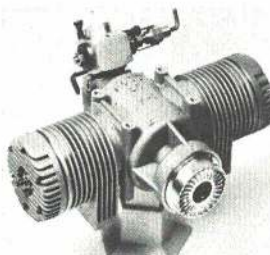
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Write for Info and Prices on the Engine of your Choice

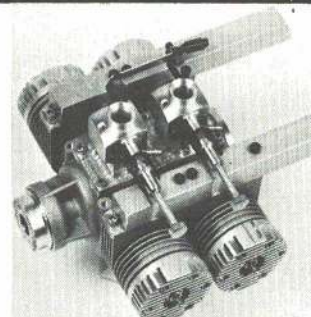
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ROSS 4
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if you want some fun

... then go out and get yourself one or more of these nifty little Control Line models.

And are they simple! Kits contain from 6 to 9 die-cut Balsa parts as well as the metal engine mounts, complete Control System (less lines and handle), Landing Gear, Wheels, authentic Decals, etc., all ready to use, which makes assembly a cinch

IN ONLY MINUTES!

Almost any .049 Engine can be used and the flight performance is just great.

... and if you bash the ground "when you're not ready to land," they're so light and strong that they're practically damage-free.

By the way, Engines from most ready-to-fly plastic models can be used, so if you have one, don't waste it.

It might require a little modification to install, tho.

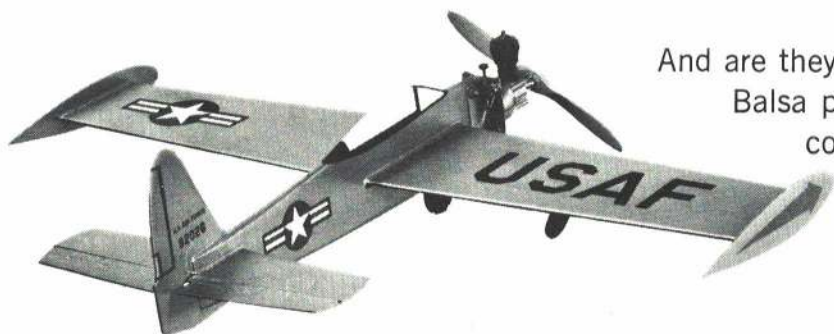
Plans are easy to read and complete.

They even have a run-down on beginners' first time flights.

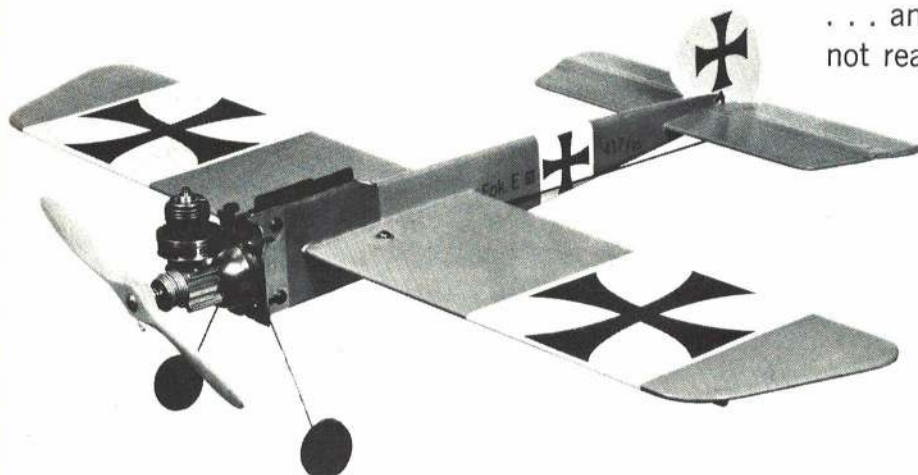
There are six models at \$2.95 and one Bipe (double winger) at \$3.50, all about 21" wing span; and all the tools you need are generally found around the house.

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... for your fun ...
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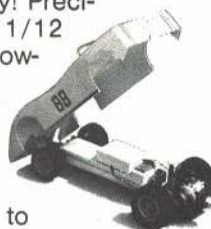
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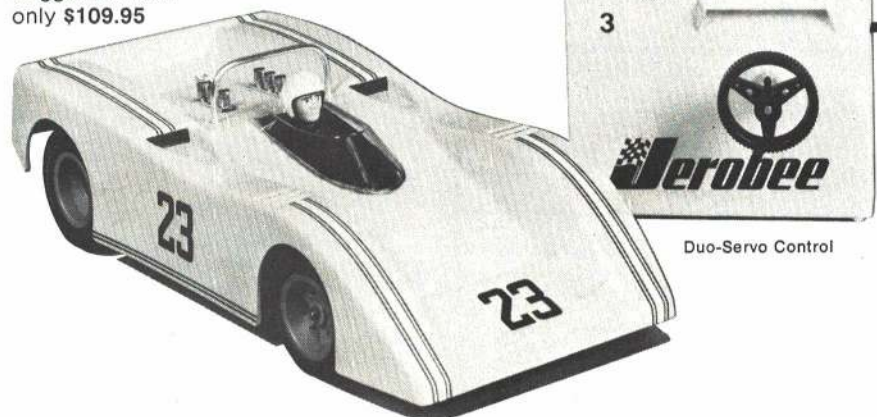
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(continued from page 68)

rebuilt the twisted pieces of metal into a brand-new 29-year-old airplane. While this labor of love was under way, the pilot and observer were located, and all were there when the scout was put in place on the battleship North Carolina (first ship to catapult-launch any airplane, in 1915) at Wilmington, N.C., in June, 1971.



The experimental prototype in 1939. These scout planes were shot from short shipboard catapults with the equivalent force of a 5-in. shell.

The production life of the Kingfisher was not very long—only from 1940 through 1942—though it remained in service several years more, before being replaced by the higher performing Curtiss SO3C Seagull and then the Curtiss SC-1 Seahawk as the end of the war drew near. Still, it was an OS2U which rescued two pilots from the very shore

of Japan, only hours before the fighting ceased. One was a Corsair pilot who had crash-landed several miles off the Japanese home island of Honshu and then had been washed ashore in his life raft; the other was the pilot of the first Kingfisher which tried to rescue him and was lost in the heavy surf. Both pilots squeezed into the rear cockpit of the second Kingfisher and were flown back to safety, arriving with all of two minutes' fuel in the tanks.

Of the 1522 Kingfishers built by Vought Sikorsky and the Naval Aircraft Factory (used by the U.S., Great Britain and later by Australia and many Latin American navies), only three are known to exist today. One is on the USS North Carolina, another on the battleship Alabama at Mobile, and the third on the battleship Massachusetts at Fall River. Only three, but they're not stored in warehouses, or even on display inside museum buildings—appropriately, they're back where they belong, poised for action.

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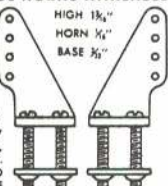
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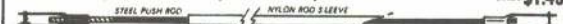
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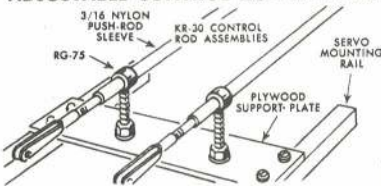
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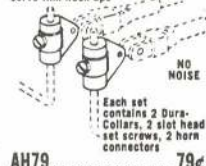


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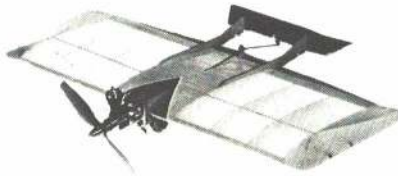
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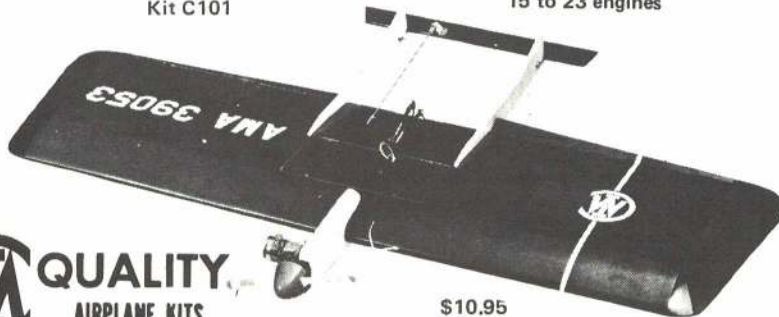


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Wingspan—35' 10 11/16"
Wing Area—261.9 sq. ft.
Empty Weight—4123 lb.
Gross Weight—6000 lb.
Wing Root Airfoil—NACA 23015
Wing Tip Airfoil—NACA 23009

Performance (on floats)

Maximum Speed—164 mph
Economy Cruise—119 mph
Normal Range—800 mi.
Climb to 5000'—12:06
Service Ceiling—13,000 ft.

Bippi-Bipe

(continued from page 21)

The NiCad battery slips down into the balsa holder on the cabin floor and is held in place by a 1/8 dowel, inserted through the cabin side planking. The finish dope holds the dowel, but it will push out easily to remove the battery. The charging jack was unscrewed from the GG unit and mounted through the side of the cabin. Use an extra piece of balsa to provide a support for the music wire extension of the on-off switch.

Leave the fuselage uncovered until the tail assembly has been glued on, the GG unit positioned, and the pushrods made. Follow the instructions for installing the GG system as provided by the manufacturer. Most important is to have free and easy movement of all moving parts. The antenna was run through holes in formers F7, F8, and F9, and then out along the leading edge of the fin.

Build the four wing panels on the plan with the spars extending to the centerline, omitting ribs W3 and W5 and the center section pieces. Then trim the spars to the dihedral angle on the center bottom, join, and with the tips blocked up to the correct height, build in the center section. Slope the 1/4-sq. leading edge on top and glue on the 1/32 sheet leading edge covering. When finally covered and finished, both wings should have about 1/8-in. washout (tip with less angle of

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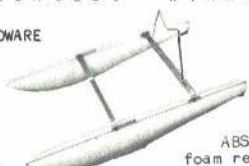
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attack than root) measured at the tip. Use the steam kettle method to obtain this.

Build stabilizer and fin on the plan using hard, strong balsa for the leading and trailing edges of these members. Rudder and elevator are cut from 1/8 sheet, sanded to shape, and given two coats of sanding sealer. After the stab and fin are covered and doped, sew on the elevator and rudder at the hinge locations. Glue the finished tail pieces to the fuselage.

Give all surfaces a going-over with fine sandpaper to round off square corners and smooth down the rough spots, then cover with your favorite material. The prototype used red silk for the fuselage and rudder, and yellow silk for the wings and stabilizer, with about five coats of clear dope as a finish. Exposed wood should be sealed and painted with colored dope to match the silk color. A trim color such as silver can be doped on to accent the fuselage.

Since the Bippi-Bipe originated from a rudder-only model, it should certainly be capable in that mode, or with a rudder/motor system. With these lighter and simpler systems, the overall weight could be reduced and a strong 049 would be ample power.

Flying

Balance the model as shown on the plan. Weight can be added to the nose or tail, different wheels used, or some shifting of the GG unit can be used to achieve balance. Check the wings for correct alignment and glue in shim strips if necessary. Adjust Mini-Links for "neutral" positioning of rudder and elevator.

Check range and also check all control action with the engine running. For test

flying, limit the amount of engine power to about 75 percent of full throttle (move Rand control arm) since the Bipe will fly well on lower power, and high throttle is definitely not wanted at this time.

With the first flights, work on the trim so that the model will almost fly itself without any commands being given. Some additional nose or tail ballast may be added if needed, but the model should be very close to trim if the plan has been followed. A very slight turn is desirable to keep the model overhead, without having to continually signal rudder.

Watch the model carefully when making steep turns for any tendency to stay in a turn to a particular direction. If this occurs, check the wings for warps and steam out the unwelcome one. Trim carefully and remove all negative tendencies during the test flying—later flights with full throttle will be pure enjoyment. With the exception of inverted flight and outside loops, the performance of the Bipe depends primarily on the piloting ability of the person with the transmitter.

Dennymite

(continued from page 33)

Secure 1/8" sq. strip balsa with ordinary model glue at fold lines and pin until dry. Scotch Brand Magic Transparent Tape No. 810 can be used effectively at fold-up seams, if desired. All open edges on the cardboard can be sealed with model cement, or appropriate-sized cap strips may be glued on and sanded to shape when dry.

The Dennymite horizontal stab has been drawn to be integral with the fuselage bottom



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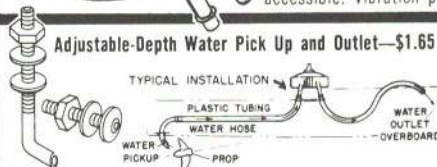
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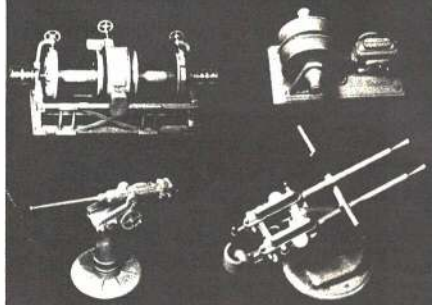
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This is the opinion of Vernon Krehbiel, owner of the VK Aircraft Company of Akron, New York. He stated "since I started building model airplanes over 40 years ago, Ambroid cement has always been my favorite. The first I ever purchased was packaged in glass vials and corked. At that time the red color was well known to be the symbol of exceptional quality. Thank you for manufacturing and maintaining the quality of this fine product through the years."

Vern is shown with two of his built-up kits. On the left is his new VK Fokker Tri Plane and also shown is the popular VK Nieuport. Both of these models were assembled using Ambroid Liquid Cement, the best cement money can buy. Try a tube on your next model or repair job, then you too will say "Ambroid's My Brand".

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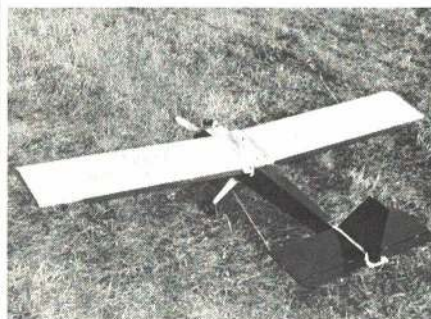
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for improved trim. The slight amount of fuselage cutting required to make this installation (as shown on pattern) is worthwhile. A deviation from the landing gear installation shown is the substitution of a tail-wheel for the nose-wheel. Consideration must then be given to positioning the main gear just behind the leading edge of the wing and the gear dowels placed accordingly.



Aileron servo fits through top and bottom wing skin. Tight balsa box around it protects servo from fuel/exhaust spray.

Finishing: The Dennykite in the photographs was finished in Super MonoKote Black, without any additional external strengthening of the natural cardboard prior to covering. However, cardboard is porous and accepts dope well without swelling. It greatly increases in sheer strength with each coat of dope applied.

Spray-on enamel affords greatest coverage and a fine gloss. Sprayed dope requires several coats, but then impact dents are easily

repaired by grafts using Ambroid or a similar glue with acetone thinner. Coverite with normal doping procedures provides an excellent finish. Fiberglass resin or Hobbypoxy resin squeegeed into the surface, sanded and primed, then sprayed with acrylic finish, provides hard, tough, glass-like structures.

The least expensive finish is adhesive-backed Contact shelf paper (Comark Plastics) which also comes in glossy white. This heavy but amazing stuff comes in 18-in. rolls, 25 yd. long. The 3M plastic tapes, available in 3/4-in. and 1 1/2-in. widths, 130 in. to the roll, in all colors, make excellent trim materials.

Whatever finish is selected, use the lightest covering needed to provide the structural rigidity demanded by the required engine size. Balancing and trimming procedures must be accurate. This is not a "Corrugated Crow"—these cardboard fold-ups are tough and can really fly.

Rainbow

(continued from page 45)

flaps of seven-in. chord were fitted spanwise under the leading edge of the wing.

Produced in only 15 months, the XF-12 made its first flight on February 4, 1946. Lowry L. Brabham was the pilot, Oscar P. Hass, the copilot, and Jim Creamer was flight engineer.

Republic tested the plane for about 25 hours before turning it over to Air Force pilots. Instrumentation and water ballast tanks were fitted to the first aircraft (491002)

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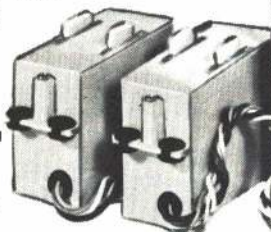
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in place of normal photographic equipment, and during 78 hours of testing, only one major and a few minor problems developed. The pilots' comments were uniformly favorable.

The major problem was cooling. The nacelles had been designed for a Curtiss Wright geared fan turning at two and one-half times the speed of the propeller. Curtiss Wright did not produce the fan, and testing proceeded with a substitute, geared on a one to one ratio. Cooling was inadequate, and climbs had to be executed in a series of 500-ft. steps, with level-out periods to cool the engines.

There were some difficulties with cabin pressurization. Other minor complaints were noted—the metal skin of the nose section “oil canned” while taxiing; the double-slotted high-drag flaps required new landing techniques, and the controls were considered to be too heavy in feel.

The hydraulically-boosted Teleflex control linkage (cables operating inside fixed conduit) sometimes caused a lag in throttle response. On July 10, 1947, test pilot Captain William W. Elliot was conducting short field, high gross weight landing tests at Farmingdale. During the flare, the engines failed to respond immediately to throttle movement, and the sink rate wasn't checked. The Rainbow slammed into the concrete, sheering off the right wheel and strut.

The engines caught just after impact, and the XF-12 roared back into the air, with the mangled remainder of the gear hanging down. Elliot flew the aircraft around for three and one-half hours to burn off fuel, then executed a perfect one-wheel landing. Major damage was a cracked main spar, which kept the aircraft in the hangar for repairs for almost a year.

A little over a month later, on August 12, 1947, the second aircraft (491002) flew, with Oscar Hass as pilot. This aircraft was fitted with the extremely sophisticated camera gear, and featured a complete darkroom in which photos could be processed in flight.

The test program proceeded, and results were outstanding. Takeoff distances were short—at 101,800 lb. the Rainbow could clear a 50-ft. obstacle in 2825 feet. Initial climb rate was 1600 feet a minute, and service ceiling was listed as 41,000 feet, although improved cooling would have raised this by at least several thousand feet. Engine-out performance was sensational—at light gross weights, the aircraft could maintain 150 mph at 5000 feet on one engine.

Speed was the most important characteristic, however, and the Rainbow easily exceeded 400 mph—undoubtedly capable of ultimately attaining speeds greater than 450 mph.

Captain Elliot demonstrated the potential of the aircraft in “Operation Birdseye” on September 1, 1948. By then designated XR-12, the Rainbow flew from Santa Barbara to Mitchell Field at 40,000 feet, its tri-metrogon cameras operating once every 50 seconds to record a 40-mi. wide photomosaic of the country. Average speed, including climb and letdown, for the trip was 373 mph.

Conclusive as “Operation Birdseye” was, budgetary restrictions had already sealed the XR-12's fate. Boeing's RB-50 could be readily procured, with a great savings in spares, ground equipment, etc. (despite the



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SERVICE EXPERTS

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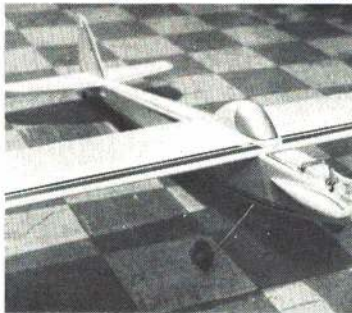
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- 6—Used 5-Ch. single stick EK Log-1, 4 servos, working. \$155.00
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- 17—Trainermaster built up, silked, red and black trim, nice low wing, trike gear. \$80.00
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NASHVILLE HOBBY

UNITED STATES



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- 89-Tatone No. 030454 custom engine mt for RR 40RC (K&B), \$4.95 net. Sale — \$3.25
- 90-Competition Starduster 900 FF, \$12.95. Sale Kit — \$7.50
- 91-AG Pactra Plastic Balsa, 39¢ net. Sale Tube — \$.25
- 92-New Topflite P-51, built up scale, silked all over, rods, wheels, \$200.00 kit, \$39.95. Sale — \$30.00
- 93-New Tatone Twister Wooden Props 10-6, 11-6, 11-8 all 25% retail sale.
- 94-New EK Logictrol 2 channel set, list \$119.95. Sale — \$96.00
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- 118-EK Regular 5 channel 2 stick, 27MC or 72MC. Sale — \$265.00
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- 121-OS 35RC, \$22.98. Sale — \$16.00

- 122-Orbit 4 channel single stick buddy system, 72MC, very small servos. Wholesale — \$300.00
- 123-Special VK Cherokee Babe, \$27.50 net. Sale — \$18.00
- 124-J. Stafford Minnow, \$39.95 net. Sale — \$29.50

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- 125-TF Super Monocoat any color, 3 rolls. Sale — \$17.66

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- 132-C'Aire 10 Ch, Tx, rec, 5 Ancco Servos (small), pak & Ch-working. \$85.00
- 133-Quadruplex CL5, single stick, with 4 servos working, complete & clean. PROPO. \$99.99
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THIS IS THE LOWEST PRICE IN THE COUNTRY. WE CHALLENGE ANY AND ALL TO MEET THIS PRICE.
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- 141-Wing Mfg. Co. Field Box, very strong, \$18.00. Your price — \$14.00
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- 143-Built up CG Shoestring, with Johnson Combat Special 35RC, all rods installed. Sale — \$75.00

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- 156-New MRC 40RC Racing engine. You can have them wholesale, \$57.98 net. Sale — \$34.80
- 157-McCoy 19RC, \$14.95 net. To you — \$10.00
- 158-McCoy 29RC, \$15.96 net. \$11.00
- 159-McCoy 40RC, \$17.95 net. Sale — \$12.50
- 160-1 used OS 49RC engine, complete. \$10.00
- 161-Johnson 1" wide blade, 12" & 11" dia. prop for AP Hub. \$1.50/set. These are all of them.
- 162-Angel Blue Max Mini Flite WW-I Bipes, \$34.95. Sale — \$22.22

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- 164-Built up Kyosho P-40, camouflaged, wheels, rods, tank installed, little under 3 lbs. Ailerons & pylon deluxe. \$125.00
- 165-Tatone No. 030454 custom engine mt for RR 40RC (K&B), \$4.95 net. Sale — \$3.25
- 166-Competition Starduster 900 FF—\$12.95. Sale — \$7.50
- AG Pactra Plastic Balse, 39¢ net. 25¢
- 167-New Topflite P-51 built up scale, \$200.00; kit \$39.95. Sale — \$30.00
- 168-New Tatone Twister, wooden props 10-6, 11-6, 11-8, all 25% off retail sale.
- 169-New EK Logictrol 2 channel set, \$119.95 net. \$96.00
- 170-1971 Blue Max Systems, complete 4 channel kit — \$159.00
5 channel — \$169.00
6 channel — \$179.00
- 171-MRC 5 channel Digital, net \$229.00, on 72 MC. \$244.44
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- 182-VK Cherokee Babe. \$18.88
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- 185-VK Fokker Triplane. \$34.00
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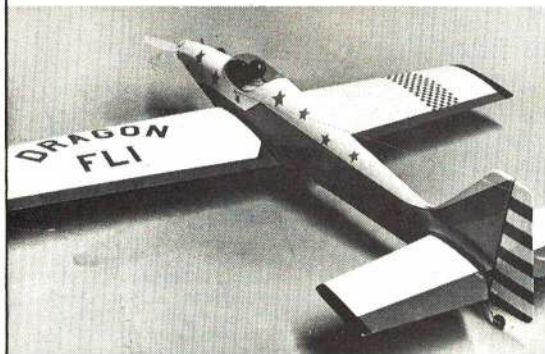
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Rainbow's better performance). The final blow to Republic's hopes for the XR-12 came in November 1948, when an uncontrollable nacelle fire burned the wing off 491003, plunging it into Choctawhatchee Bay, Florida, killing two of the seven men aboard. The number one aircraft, 491002, was eventually destroyed as a target at the Aberdeen Proving Grounds.

Republic made a determined effort to garner airline business with the "RC-2" version of the Rainbow. Besides the obvious internal differences, the RC-2 would have been five ft. longer than the XF-12, and would have had only one turbosupercharger in each nacelle. The structure would have been lighter, being built to a lighter design load.

Republic's guarantee of a 400 mph cruise for 4100 miles of no-reserve range appealed to Pan American, who placed a firm order for six "Rainbow Clippers" for use on both foreign and proposed domestic routes. Total contract price, including an option for 12 more aircraft, was \$20,000,000.

American Airlines followed Pan American's suit by placing a firm order for 20 aircraft, at a total price of \$22,000,000. The Pan American version would have carried 46 passengers, while American's, designed primarily for domestic routes, would have seated 40 passengers.

The Rainbow's fiercest competition would, of course, have come from Lockheed's famous Constellations. The Rainbow performance characteristics were superior to the Connie in all respects. The latter had two big advantages, however: it would carry 69 passengers, compared to the 46 maximum of

the Republic airliner; it had a backlog of experience in producing Army Air Force C-69's.

Unfortunately, almost all airliners except Eastern found themselves in deep financial trouble in 1947. Costs had skyrocketed while fares had remained static. Worse, the expected boom in national air travel had failed to materialize. Thus, despite glowing advertisements picturing 491002 in American Airlines livery, the Company was forced to cancel its order.

With no prospective military orders, it was not feasible for Republic to undertake the manufacture of only the six-plane order for Pan American. Besides the heavy investment in the Rainbow program, Republic was suffering additional deficits in its ambitious "Sea Bee" project. Quietly, sadly, Republic decided there was no pot of gold at the end of their "Rainbow," and the aircraft faded into history.

	Rainbow	Constellation (049)
Span	129' 2"	123' 0"
Length	93' 10"	95' 2"
Gross Wt.	101,600	98,000
Max Speed	425	347
Range	3500	3000
Passengers	46	69
Engines	R-4360 3000 hp	R-3350 2200 hp

5RS

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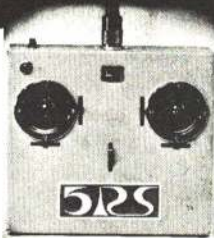
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In constructing the fuselage, cut formers Nos. 1 thru 8—1,2,3 and 8 are 1/8 ply; 4,5,6 and 7 are 1/8 hard balsa. The part forming the bottom of the fuselage between 2 and 3 is 1/8 ply and should be cut at this time. The cockpit section was built first (2, 3 and bottom plus side panels). The two lower back longerons are cut and marked for placement of 4, 5, 6 and 7. These are glued in at the proper angle. When set, add top longeron from 4 past 8. Let dry and attach to cockpit section (bottom of 3) and glue in top longerons between 3 and 4. Alignment may be maintained by weighting down the cockpit

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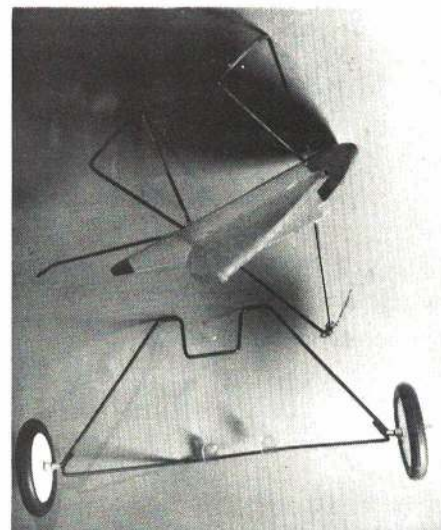
to the plans and blocking rear to proper height. (Diagonal bracing should be added at this time.)

This becomes one of the fun challenges of this type of design—each joint requires two cuts for proper fit. If they all fit firmly, you will have a very strong structure. No. 8 may be added at this time. Cut holes in former No. 1 for engine mounts to correspond with yours and continue to build up nose section in conventional manner. Should radial mount be desired, a former may be added between the nose and No. 1 to correspond with your mount. Landing gear and pylon are wire-formed and brazed. (Originally Les? He brazed and plate-pinned all his joints, claiming the flex gave additional strength.) I have used brazing on many planes without failure. In fact, that is all I have left of most of them. If unable to braze, then wire wrap and solder in usual manner. On light loads pure silver solder will work.

The wheels are three in. Williams; the original used wire spoke wheels with canvas covers. The shock absorbing landing gear is very simple, the tension being controlled by the number of rubber bands looped over the nut and bolt placed at the bottom of No. 2. The nylon hinge mounts are standard 1/8 in.—found at most marine or electronic supply outfits. The little extra time it takes for this gear is well spent, as DT's and hard landings can break this type of wing mounting easier than standard types. The side longerons which hold the covering away from the fuselage may be added, giving the Longster a clean look.

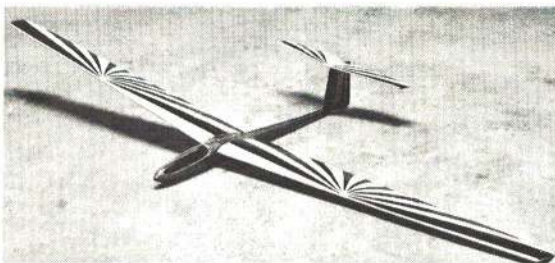
The stab and rudder are cut from 3/32-in. straight grain balsa. The wing is designed

around the Clark Y rib, as used by Les on the original, and can be made of one section adding the pylon at the center. I designed it with the removable sections for ease of transportation, a stronger and more adjustable mounting, the ease in the adjustment of the rigging and a safeguard that would make it



The fittings mount cabane and landing gear assemblies. Removeable for service or repair.

more simple to correct any mistakes I might make. (I wasn't sure how to design a strong enough pylon on the original.) Knowing what I do now about the flying of this ship, I would make the free-flight versions one unit and the radio types removable. I prefer the notched balsa leading and trailing edges for



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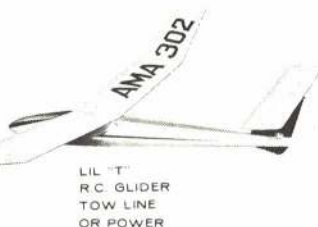


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strength—they seem to warp less than other methods. Should you make the two section wing, the first five ribs are cut from 1/16th ply and the rest are medium-to-hard straight grain balsa. I used spruce spars, although balsa may be used on the smaller scale. Spruce was also used between the ribs where the screweyes are mounted for the rigging. The tongue portion of the pylon that fits into the wing is a laminate of 1/16th ply on both sides of 1/8th hard balsa sheet. Sheeting between the first two ribs will strengthen and stop the first bending in when covered. Some say the

wind passing wing makes the model fly, but I am sure it must be the sandpaper. The more I sand the better they fly—and look. I never could understand why some modelers would spend hours and hours building and only a few minutes sanding.

Covering this plane is somewhat dependent upon what you intend to do with this model. The RC version was covered with MonoKote. The factory instructions are good but, as mentioned earlier, I coat all surfaces with a 50/50 solution of Titebond and resand with

220 paper. This not only strengthens the structures, seals off and fills the grain, but gives a stronger bond between the MonoKote and the wood. This wing is strong enough if covered in the recommended manner; however, I have found that MonoKote sealed down to each rib adds tremendous strength. The only caution is that your iron be Teflon coated and just the right temperature. Sometimes this coating wears off; you may recoat your own iron. I also Teflon coated some small blades for corners that were heated from the surface of the iron. The

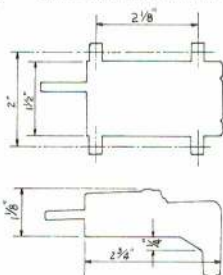
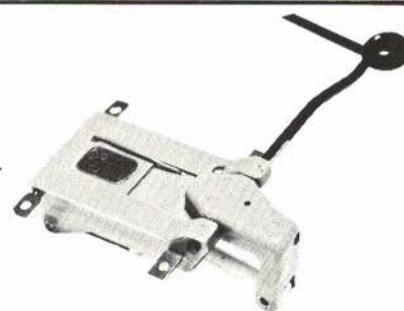
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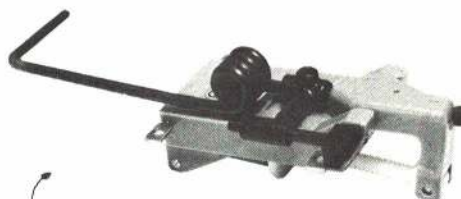


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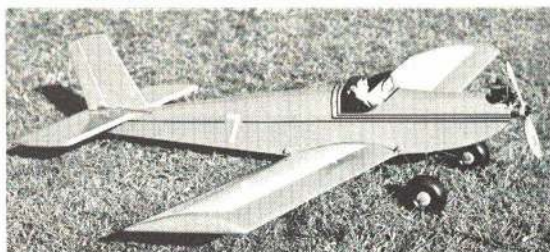
5305 TOWSON • FORT SMITH, ARK.

product I use is No. 6075 Dry Fluorocarbon, temperatures up to 550 degrees F, made by Crown Industrial Products Co., Hebron, Ill. 60034. The FF version was covered with lightweight silk, applied dry, sprayed with water, sprayed with spray starch and sealed off with three diluted coats of dope, trimmed and added detail.

The rigging and bracing of the plane are important steps in the construction of this type of model. Strength, looks, scale points and trim are all dependent upon how good you do the rigging. The fittings shown in the pictures are all that are needed. The cable is

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20 lb. test vinyl-coated steel and corresponding sleeves that can be found at most fishing tackle supply stores. The keepers are standard Goldberg fittings. Rubber bands are inserted through the aluminum tubing at the base of formers 1 and 3 to hold rigging to



A rubber band in the fuselage provides the shock absorption. Should be fairly stiff.

the fuselage and screw eyes are used on the wing. To check, you should be able to pick up the plane by the wing tips and have very little flex. Turnbuckles make it easy to adjust in the field, but not necessary. So they won't vibrate apart, tie a small string through the adjusting sleeve and one of the eyes.

Flying

Make sure the center of gravity is correct, add weight as needed. Incidence may be changed by relocating the pylon keepers. Try to test glide in area with high grass, making sure the nose is slightly down when you release. I always feel safer, on the first test glide, if I run alongside and let it fly out of my hand. ROG is recommended for the first flights. Engine speed should be just enough to get it off - this way it will look very realistic. This has been a fun eye-catching plane that is quite easy to build, fly, and maintain.

Wittman Buster

(continued from page 29)

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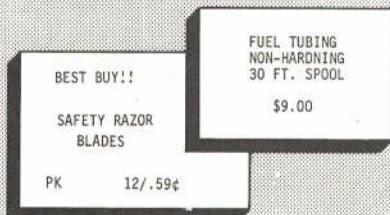
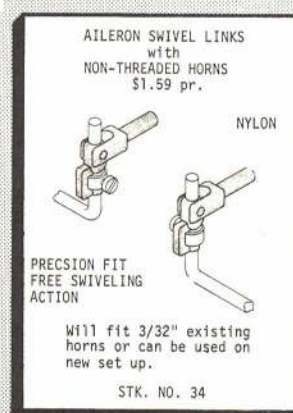
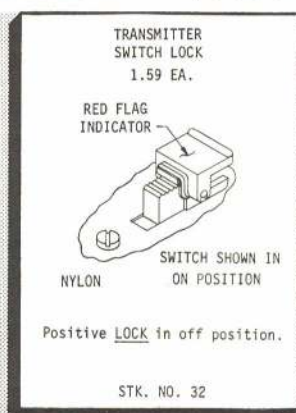
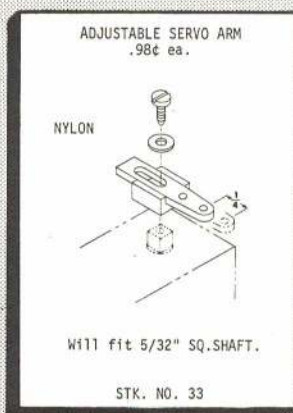
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Cover the wing, fuselage and fin with one ounce fiberglass cloth, as sold by World Engines, in the following manner. Cut pieces of the cloth to the shape of the various parts, remembering their positions. Mix a small batch of Formula II Hobbypoxy, and thin it to a brushing consistency. Brush a relatively thick coat on a surface and lay the appropriate piece of glass cloth over it. Smooth it out into place, using the thread pattern to properly locate it. Carefully form the edges over the fillets and around the corners. It is best not to add more epoxy over the cloth at this stage, for, unlike working with dope, an additional dab does not thin or soften the coat underneath. Added epoxy only makes the smoothing process more difficult and messy. Work the cloth into the proper position and smooth out any air bubbles underneath. In order to complete the

entire model, this will probably have to be done in several sessions to prevent moving previously positioned panels, or getting the epoxy all over everything. A double layer around the front end and over the cheek cowl will add a considerable amount of strength while adding little weight. Brush two more coats of the thinned Hobbypoxy II over the whole model, sanding with 180 grit paper between coats. Rough edges of the cloth can be attacked carefully with files of various shapes and coarser grits of sandpaper.

After all of the rough spots are worked down to approximate shape, go over the whole model with wet 180 grit, followed by 320 grit paper. I use an aluminum foil pan as a water dish. Adding a few drops of dishwashing detergent keeps the paper from filling and makes it last longer. Wipe off the dust-water residue with paper towels. The wet

sanding process not only makes the sanding easier, the paper lasts longer and the epoxy dust mess is kept to a minimum. The 180 grit wet paper cuts fast, so care should be taken to avoid going too far.

From this point on, two different routes can be followed to provide a good base for a beautiful finish. One is to apply a coat of Hobbypoxy Filler, used exactly according to its instructions. The other is to spray on two or three coats of Hobbypoxy Clear, sanding with 400 grit in between coats. Final sanding with either method is with 400 grit paper. Two sprayed coats of Hobbypoxy Silver do the final filling and give a solid color base beneath the final color coats. Edges should be treated to liberal applications of the paint, for these are the areas which seem to absorb extra sanding pressures and the accompanying erosion during sanding. Go easy on the

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sanding in the canopy, license number and racing number areas. This allows the undercoat to double as the surface coat by masking out the appropriate outlines before spraying the final color coats. I spray on one heavy coat of the final finish color, going over and over again for good coverage—again, heavy on the edges. It is best to use a rather thin consistency to avoid spattering and an "orange peel" effect.

Allow at least 48 hours for the paint to harden before attempting the final sanding. However, the masking tape should be removed as soon as possible. The final, final sanding is done with 400 grit and then 600 grit paper and followed by polishing with rubbing compound. Go easy on edges or the undercoat might start peeking through.

Raid your decal box for accessory manufacturer decals and any other decorations which will add realism to the model. Install the engine-fuel tank system, wheels, elevator hinges, and balance where shown. Next item is to pick up your teammate and go flying.

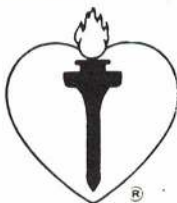
The method of finishing Buster, which I have described, was developed as a result of combining information obtained from various sources and experiments of my own. Done properly, it yields a finish which will draw compliments anywhere. I particularly pride myself on the finish of my models, whether it adds to their performance or not. Most of the epoxy put on in this type of finish is sanded off again, so the finished weight is no heavier than a dope-filled one. The advantages of this system, besides those of appearance, are a stronger, smoother, harder, fuel-proof coat which does reduce drag and is much easier to keep clean. Choose whatever method suits you, but the wings and fuselage should have a reinforcing covering of silk, nylon or heavy tissue.

Buster's first competitive outing was a contest at Daytona Beach, Florida. Our main competition was a Supertigre G 15 glow-powered Falcon, fielded by the 1970 Nats-winning Rat Race team of Art Chambers and Stan Simpson from Jacksonville, Florida. Never have I seen two models so equal in speed. There was only one pass in 240 laps of racing. Our heat win came when Stan's slow start wasn't offset by my slower clumsy pit stop. This pattern was repeated in the feature, except I was able to match Stan's lightning-fast stops. A blown glow plug on their third stop assured our victory in the time of 9:37.0 for the 160 laps.

Art and Stan later went on to win the Rat Race event in 5:29.3. They are the best drilled team that I have ever watched. Even Stan's left-handed pit stops seem to be faster than a right-hander. This well-drilled precision is what wins the races in these team events. Planes may be faster, but they lose all this advantage in slow starts, restarts and fumbled pit stops. A team must work together on the practice circle, determining not only the best fuel, plug and prop combinations, but also developing the teamwork and coordination required to see them successfully through the hectic activity of the actual race.

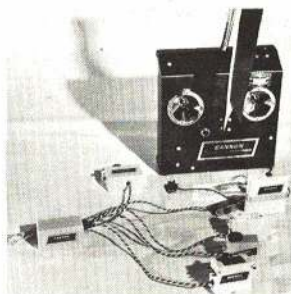
Neither of the two MVVS's handled quite as well as I had hoped for competition, and will be retired to my engine collection. Buster will take up a place of honor on my workshop wall. She has the longest winning record of any full-size racing plane and has the lines and performance, in model form, to win for you, too.

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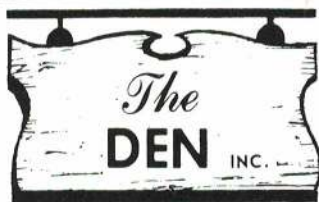
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Blue Ribbon

(continued from page 40)

Since boats and cars can be operated legally only on the 27 MHz (and not 72 MHz) frequencies, the set is available on that band only, with changeable crystals available for each of the six frequencies. These are: 26.995 MHz, 27.045 MHz, 27.095 MHz, 27.145 MHz, 27.195 MHz and 27.255 MHz. These must be purchased in matched pairs, identified by a color cover—brown, red, orange, yellow, green, and blue respectively for the frequencies listed. It is a bit surprising to have the 27.255 MHz frequency provided because of its widespread use; however, remember that interference isn't usually a disaster for a car or boat and they are not nearly as susceptible as an airplane, since they are not airborne.

Electronically, the Deans systems have always uniquely featured the use of a "double synchronization pulse" which they feel gives better noise rejection and interference resistance as well. This means that two synchronization pulses are transmitted prior to the three information pulses. The frame rate is set by a free-running multivibrator, followed by a fixed width half shot multi to provide the second sync pulse. Six trim pots are visible on the encoder. Trim pots are used to set the frame rate and the width of the half shot, thus the separation of the sync pulses. The sync pulse half shot is followed by three controllable half shot multis, each set for a nominal 1.5 milliseconds and variable 0.5 milliseconds for control. Broad adjustments are set by the manufacturer (don't touch any

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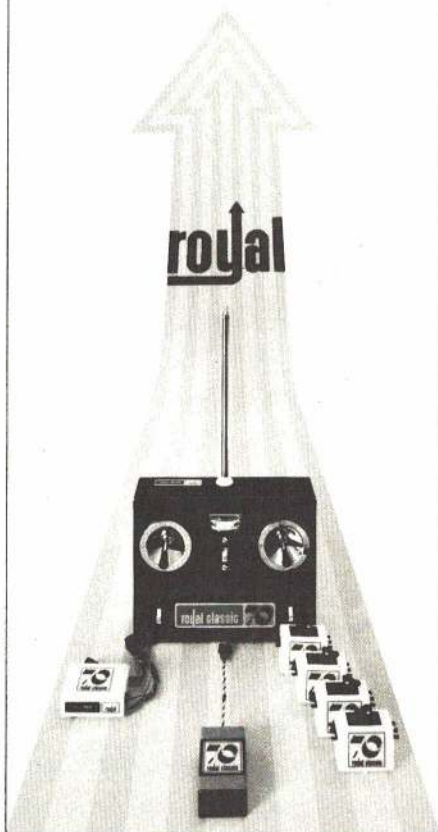
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SYSTEM FEATURES

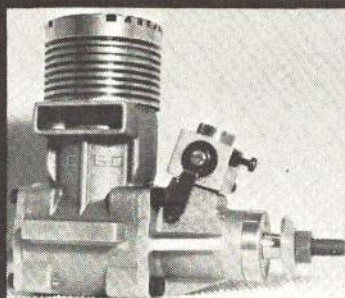
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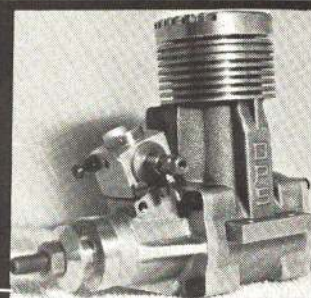
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of these pots unless you have a scope to set the baselines and know what it's all about) via a trim pot for each channel.

The encoded pulses are fed to a two-stage amplifier with the encoded pulse set by the sixth trim pot at approximately five microseconds. A zener regulator provides a stable voltage to the encoder section; however, RF section voltage is unregulated at a nominal 9.6V (battery voltage).

The RF section is all tuned by LC circuits. A relatively broad tuning master oscillator is used (as in most RC systems) and frequency is held within the necessary FCC tolerance at each frequency spot by the changeable crystals. Interstage filtering is LC and modulation is accomplished at the interstage. Final filtering is achieved through a simple, tuned LC circuit and a tunable inductive base

load for the antenna. RF indication via the meter is accomplished by rectifying a minute amount of antenna input power, which gives a relative indication of RF output.

The transmitter also contains a transformer isolated charger for the transmitter and airborne battery packs. This unit is located on a separate printed circuit board mounted to the back of the power switch. A clever indication of charge is provided by the charge lamp, which gives a warm glow through the plastic RF meter, visible from anywhere in the shop.

Both the transmitter and receiver tested used 450 mah cylindrical nickel cadmium cells. The airborne pack may be had as a 225 mah pack at the option of the individual. No change is needed to charge either. Either a square or flat pack may be specified.



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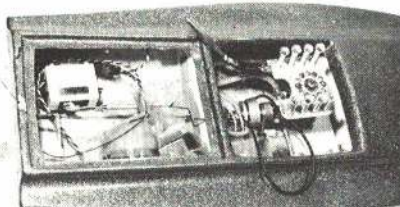
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The receiver is housed in a grey metal case measuring 1 1/2 x 1 7/8 x 11/16 in. The changeable crystal protrudes another 1/4 in. above the case. A tiny plug block, consisting of three ganged Deans four-pin connectors, carries all power to and signals from the receiver and servos. A separate four-pin, coded connector and switch harness is used for power.

The receiver features an inductively center-loaded antenna totalling about 18 in. in length. The vertical music wire flexible portion is only 7 in. long. This makes for an ideal boat or car installation. The front end of the receiver is double-tuned. All RF and IF components up through detection and AGC are contained on the bottom board. The



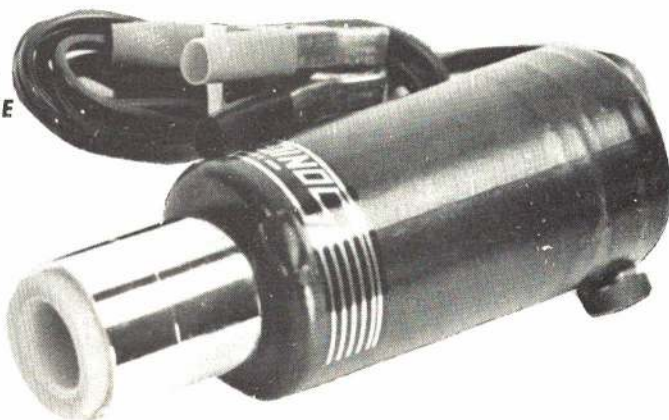
Author describes beginner's installation problems; solutions are shown here. Boats give radios mighty rough treatment.

receiver is straightforward with three stages of 455 kHz IF following the front end. The detected audio is amplified in a capacitively coupled two-stage amplifier, then passed to the decoder.

An interface network between the receiver and decoder squares the pulses sharply via a Schmitt trigger. Decoder synchronization (start) pulses and shift (advance) pulses are formed in the interface network. These pulses are used to control a series of two transistor shift stages connected as SCR's, i.e., the start pulse initiates the shift in the first stage and the advance pulse removes the supply voltage from all stages to return them to zero. However, as each stage returns to zero, the fall is capacitively coupled to the next stage gate to turn it on until the next control pulse is received, and so on. The advantage of this type of decoder is that up to three servos may

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be used in parallel for large, fast boats to control the rudder.

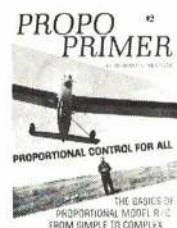
The servo amplifier is designed specifically to permit paralleling, extra isolation being provided in the interface. The usual one shot multi controlled by the feedback pot provides the reference pulse. A resistor comparator is used and couples to the usual pulse stretcher and drive networks for clockwise and counterclockwise rotation. The test servos used Amperex 2N4105 and 2N4106 germanium transistors. However, we were informed that sets now in production use silicon output transistors which normally are used to give better thermal stability.

The SKdaddle, a boat with some new kinks, is a fiberglass ARR (Almost Ready to Run) package containing all the necessary hardware except for the engine, radio and connecting linkages. Assembly consists primarily of cutting out the proper hole in the bottom of the boat and installing the stuffing tube and prop shaft. The builder chose to epoxy the brass tubing stuffing box to the fiberglass hull and then to build up the support area underneath with epoxy. This could be improved by attaching some small brass flanges to the brass tubing or by at least roughening the surface to permit the epoxy to grip the tube. Epoxy does not stick well to the fiberglass hull, so anywhere an epoxy bond is to be made, roughen the surface slightly and be sure to clean off any oil, etc. with dope thinner.

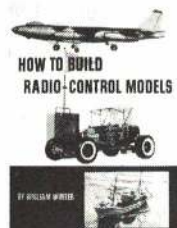
The rudder was installed by mounting a hardwood block aft of the equipment compartment, drilling a hole up through the hull and block, and inserting the rudder post.



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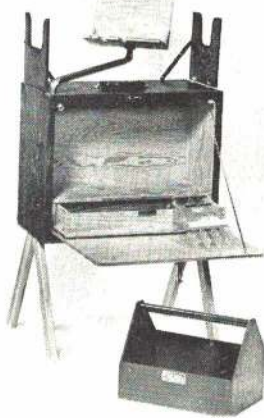
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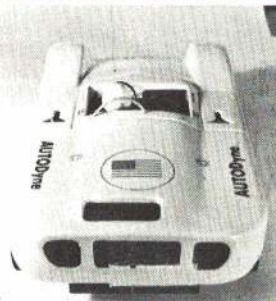
decided there had to be a better way.

As an interim, a loop of chalkline about 8 in. dia. was fashioned. (Of course, a square knot was used!) This was passed under the flywheel before the knot was tied, so it obviously had to stay there. The upper end of the loop was engaged to the starter fitting of an electric starter normally used for aircraft models. By bringing the starter up to speed and quickly hauling the loop up against the flywheel groove, a successful start was achieved. However, during the ensuing run the loop of string was shredded, but at least the concept was pleasing. Fruition of this approach was gained by using not a loop of cord, but an "O" ring used for sealing automatic transmissions. Two of these were obtained and are about 6 in. in diameter with the diameter of the tough neoprene material

being about 3/32 in. This really solved the problem—only one has been needed thus far for about 100 starts and shows no sign of wear. The technique, again, is to engage the started "O" ring and flywheel lightly, bring the starter up to speed, then haul up on it. A quick start is guaranteed every time.

Numerous runs were made on the boat in smooth water and in chop. In extreme chop, the prop will occasionally cavitate and throttle must be retarded to regain thrust. I am told by an expert in hydrodynamics that this can be overcome by a deeper "V" in the hull, by numerous gimmicks and/or simply may be a matter of the angle of the shaft as installed. In any event, estimated speeds of around 25 mph were achieved using stock engine, fuel and prop.

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environment in a boat is really tough. The engine shed its muffler; an engine intake filter quickly parted company; the nylon prop battered away at the shear pin and was replaced by a bronze prop; servo mountings came loose as mentioned earlier; and, after many runs, one gear in the rudder servo suffered some damage. The moral here is to mount everything solidly, except for shock mounting of the servos and receiver. Use the rubber grommets provided to mount the servos and don't tighten excessively. Mount the receiver and battery pack loosely in a lot of foam and then seal tightly in a polyethylene bag to keep any possible moisture out. Be sure the hatch is tightly sealed in place; Scotch brand frosted tape was found to be an excellent seal and also holds the hatch in place. Take along a bottle of thinner and fresh tape when at the pond. In the event adjustments are needed, remove the old tape and discard. Clean the hatch and surrounding area with thinner, then apply fresh tape.

All in all, the system and boat are a real ball! As usual, a few minor criticisms were found. The transmitter antenna broke where it had been turned down slightly to enter the antenna fitting. A check with Bill Deans indicated a new antenna is now being used and the problem will not recur. During one of the bench sessions, the receiver ceased operation, due to the receiver crystal being slightly loose in the socket. Do not use a straight pin to crimp the socket tighter. Simply bend the pins of the crystal apart slightly and the problem is taken care of. The receiver ceased functioning during one of the operating sessions and it was assumed that the crystal was loose; however, this was not the case and the problem was traced to a failed transistor in the receiver. (This can happen with any system and is not a criticism.) Bill sent a second receiver immediately. The same crystal was simply installed from the failed receiver and there was no loss of range, even without retuning. An outstanding receiver design!

The boat performs well and is easy to get ready. A somewhat simpler arrangement might be provided to ensure the correct placement and alignment of the shafting. However, the difficulty of doing this for several sizes and configurations of engines is fully recognized. The universal joint sheared after some 50 or 60 runs. This was due to the relatively light (1/8-in.) neck of the aft section of the U-joint which is turned from brass. If alignments are held correctly, this dimension can be increased. If the modeler intends serious competition, it will probably be desirable to beef up this area by replacing it with a heavier U-joint.

This review has been made a little longer than usual to let those who have had little experience with power boats have the benefits of the hard-earned lessons encountered.

On The Scene

(continued on page 12)

following the last day of school, and several of the boys showed up at the field with their fathers. There were three flying events: Hand Launch Gliders, Rubber Powered, and Tow-line Gliders. Four of the boys who had past experience built towline gliders. Fortunately, the weather was excellent and the contestants had a lot of opportunity to fly their models. By noon we closed the contest and issued the prizes to the winners of the various events.

(continued on page 98)

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On The Scene

(continued from page 97)

Ernie and I sent up our powered ships to show the students how a free-flight engine-powered ship operates. Fortunately, Joe Bilgri was there testing out one of his Wakefield models in preparation for the Nats. This gave the students an opportunity to see various types of flying.

As is often the case, the teacher learns more from the students than the other way around. One thing I learned is that our beginning modelers need simply-designed ships that will fly. If the model is simple to build and flies satisfactorily, he will develop a greater enthusiasm for the hobby. Also, greater stress must be put on proper adjustment of the model for flight after the construction is completed. What is simple for us experienced modelers can be a very difficult hurdle that the beginner cannot overcome. The Tenderfoot series of models in this publication is a sensible and practical approach toward giving the beginners a good start in modeling.

CHECKLIST CORRECTION: Price and supplier for the Diglace 4-channel radio system in October issue should have read—Diglace-4 \$189, dry battery operation and Diglace DP-4 \$239, rechargeable nicads and charger. See AAM's review of this fine set in June '71 issue. Imported by: Herb Abrams Rand Sales, Box 20059, Columbus, Ohio 43220



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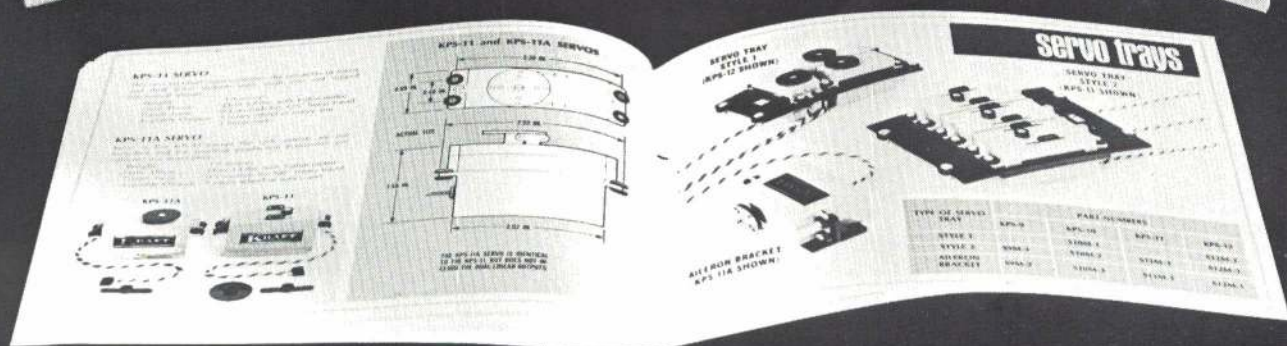
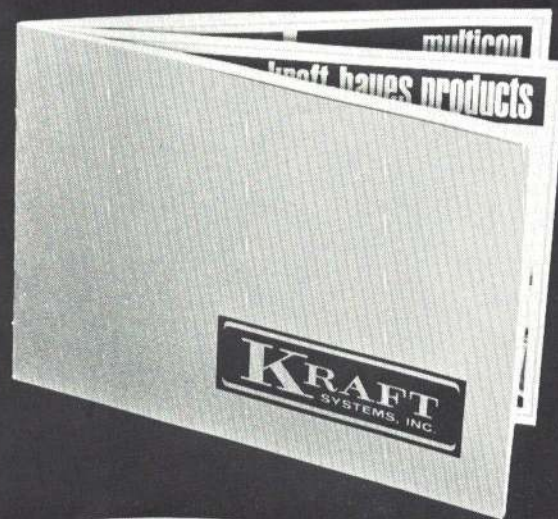
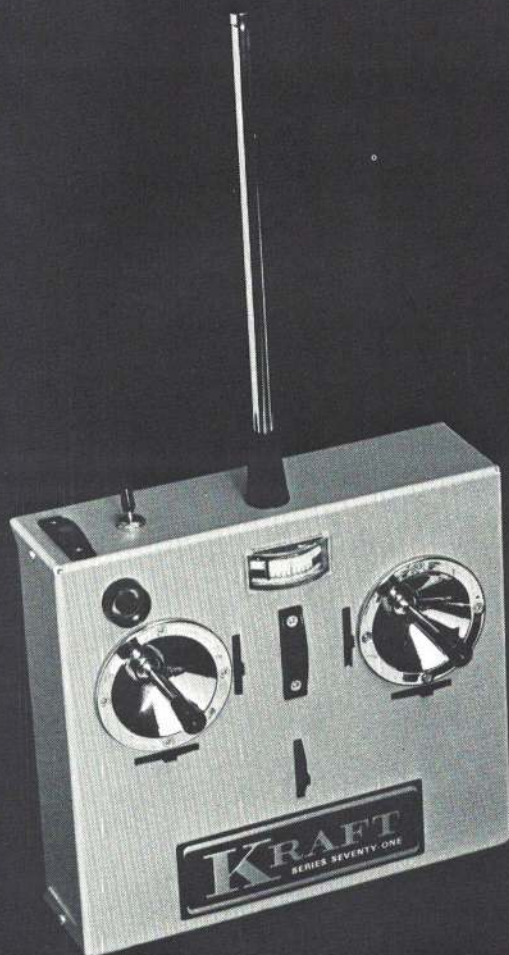
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