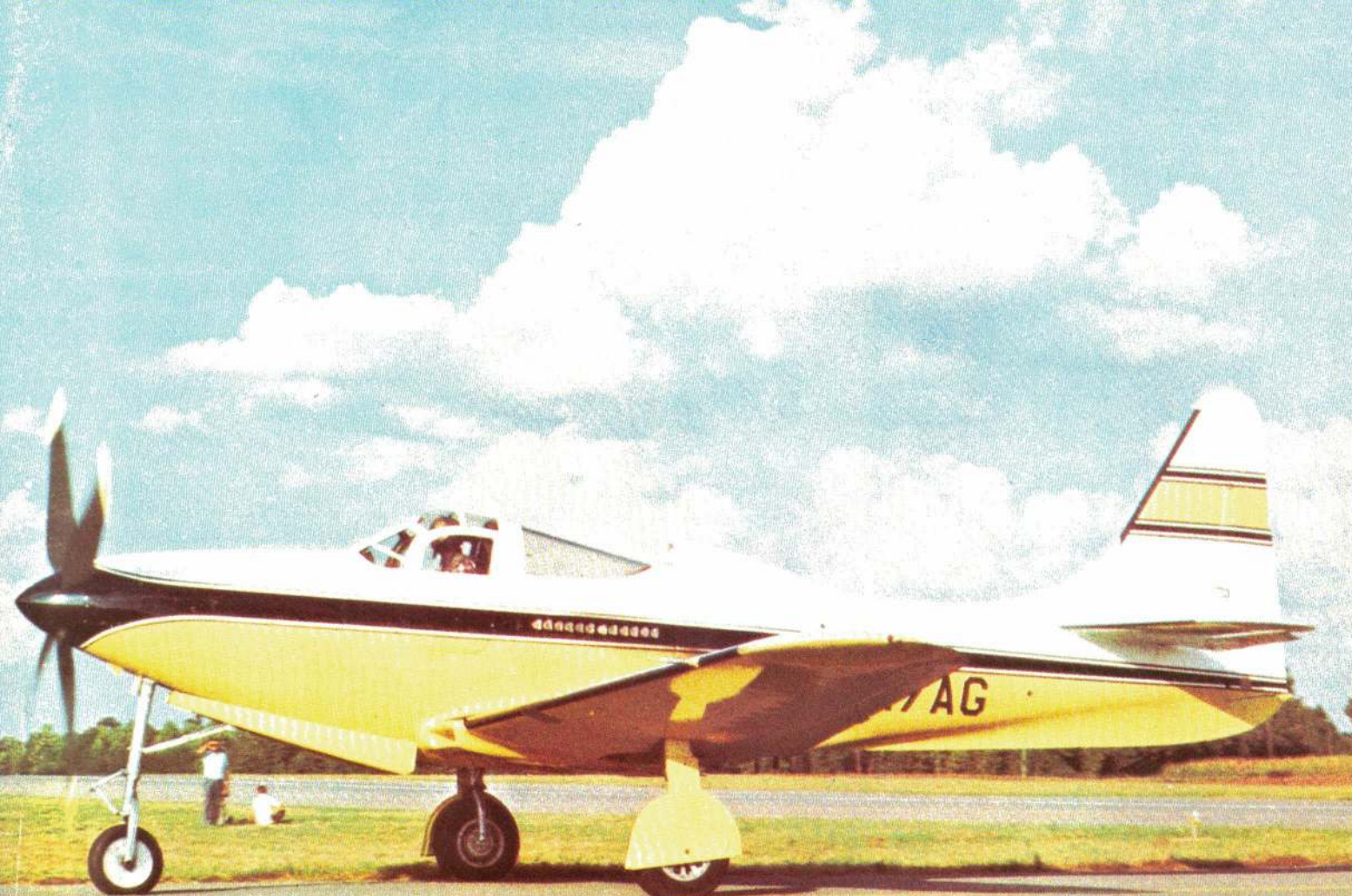


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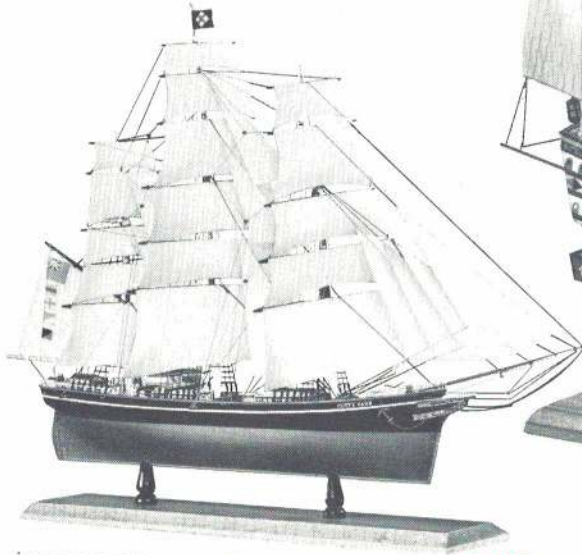
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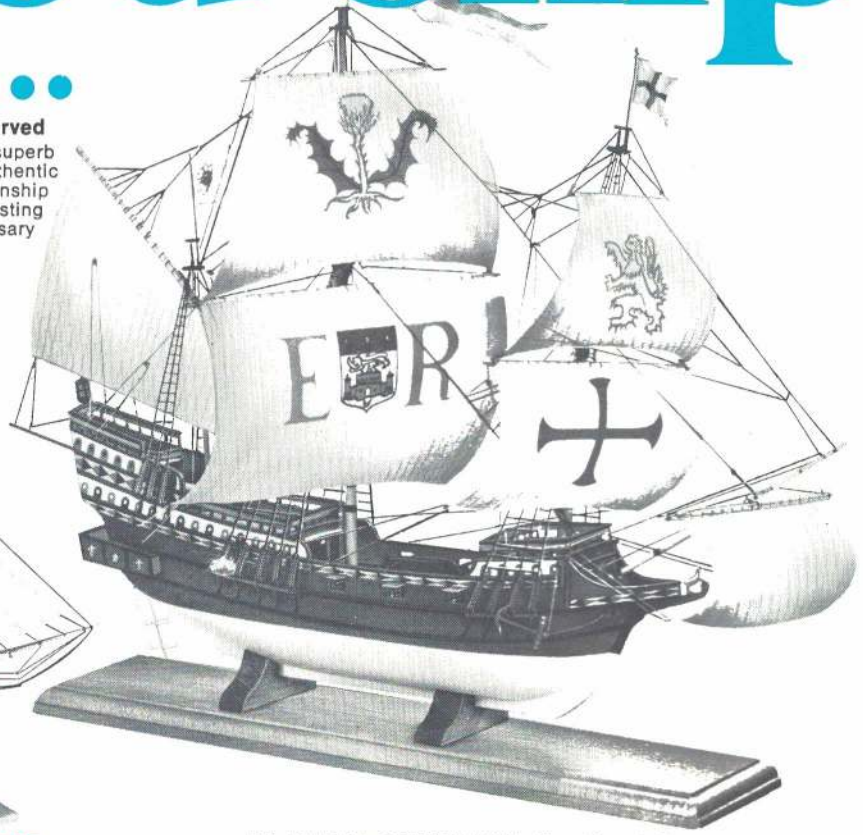
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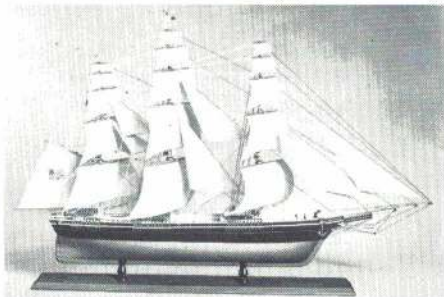
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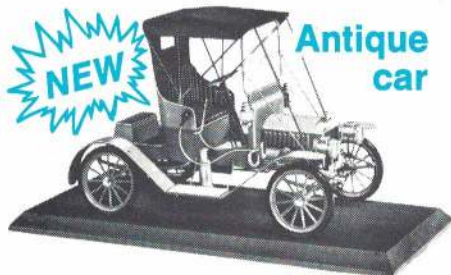
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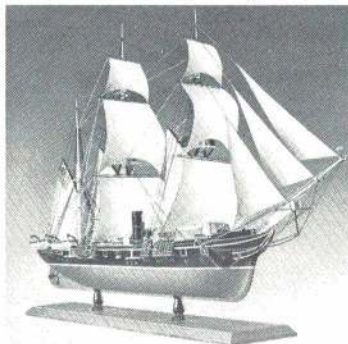
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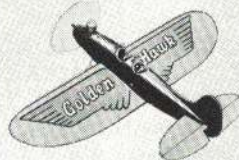
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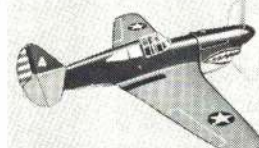
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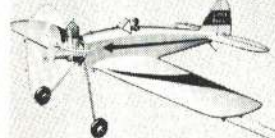
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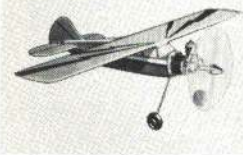
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COVER PHOTO: The rare P-63F Kingcobra. This once-active Air Force fighter has been in civilian use for many years. Imagine having one of your own. Alvin T. George, Atlanta, loves it. Photo by Jim Sullivan was taken at Gastonia, N.C., antique fly-in.

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IF SOME EDITOR with an axe to grind was behind that horrendous story in the *Los Angeles Times*, which has done more damage to this hobby than anything in history, we would not want that gentleman to miss this opportunity to turn injury into insult.

"Smugglers Said to Fly in Dope on Model Planes" reads a headline in the *Philadelphia Bulletin*. Possibly because this famed paper is published in the City of Brotherly Love, the head at least used the words "Said To." Actually, the story was picked up from United Press International, dateline London, England.

"Police said yesterday they will investigate a report that drugs are being smuggled into Britain by electronically-controlled model airplanes," the 'report' leads off. "A spokesman for Scotland Yard (that makes the *L.A. Times* plebian) said they had received reports that model planes with 8-foot wings (the CSA of the dope fleet?) were being launched off the Southeast coast of England and could travel up to 100 mph with up to 10 pounds of heroin." (A glitch could cost a fortune!)

More than one tongue-in-cheek troublemaker has had murky ulterior purposes. There was, for example, the guy who headed up a nationally syndicated newspaper program for model builders. When a magazine intruded into his act, he used his column to attack gas models as dangerous. Insurance underwriters became upset, as they are now, when the *L.A. Times*, and its syndicated associates, run a headline reading "Model Planes Growing Peril to the Airways." In the case of our magazine-hating friend, the result was a banning of modeling activities by legislation in two states. There have been other similar less serious instances.

What is cynical about the *L.A. Times* story is that no reporter is as incompetent as we all assume this one to be. The reporter writes for a living and all too often must do what he is ordered to do. This guy thoroughly researched his field—he left bear tracks everywhere—then deliberately lumped together spectacular facts about record-breaking model flights made under controlled conditions with the knowledge and approval of responsible agencies. He presented these facts as evidence of widespread operating conditions which imperil the lives of those who fly in aircraft. Why did he do it?

In his April issue, Don Dewey printed an open letter from Loretta G. Hall, president of the Los Angeles Model Hobby Assoc. to John

Worth, Exec. Dir. of the AMA. The letter is most interesting, especially when treated as a guest editorial with Don's introductory remarks.

The letter validly stresses a "coincidental" relationship between mysterious doings about local flying site problems and the *L.A. Times* story. Perhaps of lesser importance is the letter's profession that AMA is our only hope and that Headquarters ought to get with it. Now Loretta may not be aware of what already has been done nationally, but your publisher would hate to have that cement albatross hung on his neck.

Loretta brings out that her group had met with city officials who promised a revised master plan would show a new modeling site. (*The L.A. Times* story happened to appear the next day.) The Department of Recreation and Parks then requested LAMHA to look at another more distant site.

Then, at a meeting with the State Department of R & P in another county, Loretta heard the Director describe how other activities in the proposed master plan would not create a noise problem, that model planes should be moved out of the way; and since we are a small group, perhaps the modelers would buy the land instead of having the state pay for their area. People clapped, so there is more bitterness here than meets the eye—and it is not necessarily related to the *L.A. Times* story.

We hear the noise bit all the time. In what spirit of public relations was "our" effort conducted that bitterness should intrude? No one mentions mufflers to control noise pollution. What really bugged the *L.A. Times*?

The AMA is not our only help. In his introduction to Loretta's letter, Don emphasizes that the opinions in the guest editorial are not necessarily those of the magazine itself. We can assume he does not agree with the *L.A. Times*. Does he then hesitate to agree with her that AMA is "our only hope?"

The Los Angeles flying site problem is a barrel of worms. If the *L.A. Times* story is responsible, and it may be, who can guard against the unexpected and biased diatribes of a mighty newspaper which can be manipulated journalistically by those within its own house who ride off on contrived crusades? Worth may be a miracle man, but we watch without envy as he wrestles with the riddles in Loretta's letter. He'll need a silver bullet.

—the Publisher.

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modeler mail

Ardent control liners

Brian McKenna and I have become ardent devotees of control line modeling within the past few months. In the past year, we progressed through the 049-powered plastic toys to a profile-constructed new Super Cobra P-63 Midwest kit, powered by a 35 Fox stunt-engine. A Fox 36 XRC was used for a Roberts' profile Cobra with Roberts' speed control. We have been rewarded with great satisfaction and considerable success.

We are already preferentially committed to tricycle gear types and would like to enjoy the opportunity of selecting more sophisticated profile and/or semi-scale kits for new construction projects. We are disappointed in the dearth of such kits; in fact, Roberts and Midwest seem to offer the only ones on the current market.

It seems RC has pushed control line into the background to the extent that manufacturers are no longer developing new control line kits. We thought perhaps you or AAM readers would be able to help us by suggesting specific kits and sources of supply from which our favorite model shop (H & H Hobbies, Southland Shopping Center, Tulsa, Okla.) could fill our needs.

We enjoy your publication but deplore the emphasis placed on RC at the apparent expense of control line modeling. We think this possibly is a shortsighted policy: already there is a growing air of boredom filtering through the RC fans because the "almost ready to fly" kits and completely developed "ready to install" electronic gear leaves little opportunity to satisfy the creative instinct which must be inherent in the successful modeler.

Perhaps other feel as we do. If we all speak up, perhaps we can look forward to new expanded vistas of control line modeling. This requires greater skill, ingenuity and craftsmanship with proportionally greater rewards for the serious modelers upon whom the continued viability of this or any hobby must surely depend.

John T. McKenna, 2248 S. Florence Pl.,
Tulsa, Okla.

Several readers have cited what they consider a deemphasis on control line. This is not the case. In this magazine there is a monthly section within "Where the Action Is" devoted to CL. Also the usual number of projects have been presented. One problem is that CL designers do not come up with a sufficient number of interesting projects. Most contest categories lack general interest. Profiles and stunt jobs appear to be the limit of imagination. Occasionally there is a scale model worth a rave. Mr. McKenna's comments about kits were brought to the attention of major manufacturers of such items. —Publisher.

N.A.E.C. will live

On behalf of both the National Aerospace Education Council and the Federal Aviation Administration, please accept my gratitude for your timely editorial. You have demonstrated that you care—the most vital and hopeful note surrounding the current problems facing the entire movement that encompasses our young people, industry, government and fine organizations like the Academy of Model Aeronautics and the N.A.E.C.

As of this writing, I cannot yet tell you how, but N.A.E.C. will survive. Largely, the faith and dedicated support of leaders like yourself helps to assure this optimism in an otherwise bleak hour.

Thanks for your confidence and support in the huge job all of us have in helping the youth of our land know the joys of learning and the thrills of individual discovery that come from a vibrant, imaginative aviation/aerospace education program.

Mervin K. Strickler, Jr.,
Special Asst. for Aviation Education,
Federal Aviation Administration,
Washington, D.C.

The Drone—two-man Ukie!

Regarding the fine article by Jim White on the OQ-2A Drone (March AAM): the saga is not quite complete.

I own an OQ-2A which is hanging in the Arlington Hobbycrafter's Hobby Shop in northern Virginia. A few more facts can be added to the record. The engine is a Herkimer (remember the O.K. engines?); the centrifugal spark advance makes it very easy to start, although the contra-rotating propellers make flipping unhealthy. One correction to make: the airfoil is not symmetrical. The wings are interchangeable end-for-end; either wing will fit on either side.

My Drone was flown control line. A 100-ft. nylon rope was used for tether up-down and an engine shutoff switch was used for control. It took two of us to hold it down.

Several flights were made, beginning with reduced power. We never got it wide open. It proved to be too much load.

One of these years, the saga may be completed when I fly this apparently next-to-last OQ-2A by radio control.

John Hunton, Annandale, Va.

Where credit is due

Robert Lopshire's article on the Hillman Model Air Park does show a great deal of what it takes to develop a really superior flying site, but one of the projects which he attributes to the ARCS was the development of the Delta Dart program in Pittsburgh, and this is very much in error.

Richard Meyer was the entrepreneur who pushed this program in Pittsburgh at the very beginning and throughout most of the following Dart contests in that area. At that time, Meyer was chairman of the Allegheny Model Aeronautics Council, the organization which developed and promoted the Delta Dart contest. The ARCS was only one of several clubs which belonged to A.M.A.C. at that time. In fact, the Pittsburgh Aeromodelers were told that if a free flight contest was to be held, they would have to run it: Dick Meyer, Ron Ganser, et al, did just that for several years.

At no time that I know of was a Delta Dart contest held in Pittsburgh by the ARCS. All of these events were organized and run by the A.M.A.C., although recently many individual members of the ARCS provided much of the manpower to run what had become a major event in Pittsburgh.

This event was not held in 1970 and, I believe, none is scheduled for 1971. Perhaps this is an opportunity for the ARCS to jump in and truly add another feather to its cap.

George Minnear, Pittsburgh, Penna.

Requests data

As a neophyte in this fabulous hobby, I have had many questions to ask fellow modelers about the technicalities and general knowledge of radio control. I have great appreciation for the time these people have taken with me.

The area that interests me most is history. I am astounded by the dedication of pioneers such as Jim Walker and Bonner. My fellow modelers and I owe gratitude to these men.

One of my interests is the Morton M-5. Perhaps another reader could give me a short rundown on the history of the old five-banger? I would like to know the person who was responsible for its manufacture, how many were made, what the cost was, and what years it was in manufacture.

I want to add that you do a great job with AAM. I find that each page is filled with something new and exciting.

Phil Ellis, Castro Valley, Calif.

The M-5 was introduced by Morton toward the end of WW II. A fascinating scale engine of the LeBlond five-cylinder radial (we think) ran very well but lacked the power of a simple one-lunger of equal displacement. Afterwards it was manufactured by the Burgess battery people, and then a forgotten company in the Illinois area. Anyone knowing the full story is encouraged to write this column.

—Publisher.



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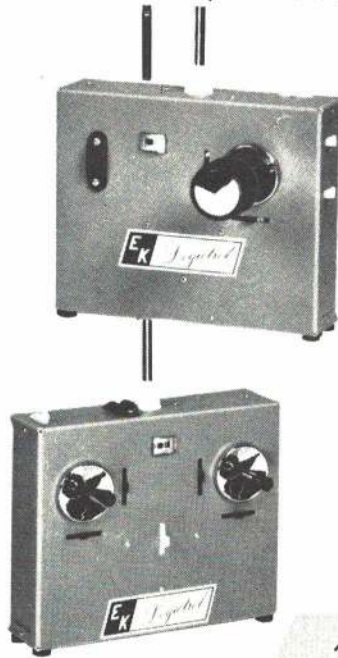
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FF: the magic ingredient

Now you have gone too far! Calling us free flighters blockheads (Straight...and Level, Oct. 1970 AAM)—what a nasty thing to do! Even worse is the knowledge that it's true—undertones all over as if free flight has gone underground. I suppose in a way it has, and we're all partially to blame.

It used to be that any hobby shop could give you all the info on local contests—tried it lately? When we moved to San Francisco some years ago, I'd ask a model shop owner, "Where's the free flight?" and he'd aim me at some schoolyard where he'd seen a kid with a Sleek Streak.

I finally found an ex-modeler at an RC field who knew where the free flights had flown to, and I pulled up to the place to see a Playboy Sr. with an ignition Ohlsson 60 go! Actually, lots of modelers are still around, but it takes a contest to whet good active modeling activity, now as ever.

And how, pray tell, does one find a free flight contest? We fly at fields over 100 miles away and if you have a good map and have been there before, you can find the area. And how do you get the word? You must be in a club affiliated with "the group" and you get a notice just before the contest. How did we ever get into such a mess?

John Pond hit it very closely with the revival of Old-timers which had the magical ingredient—fun. But even that won't save us. I can still run my ignition Ohlsson in a 30-year-old model, and love it! But the under-30 crowd just might not, and the real continuity of modeling is with the new people.

I'd like to offer here my sole contribution to fun and flying—it worked back in 1946 and still does. A simple roster for free flight contest: any free flight is okay; 20- to 30-sec. engine run; one minute max flight (over one minute is subtracted until two minutes equals zero); three flights; total nearest three minutes wins; no DT's allowed under two minutes.

This is fun flying. It takes small areas and anyone can compete and win (even old chubbies can enter). In the old days, contests were announced in any model store, prizes were good and plentiful, printed programs listing entrants, plane and engine used were handed out at the field. Usual entry: two to three hundred!

It took a lot of doing, of course, but I haven't seen the likes anywhere since. Maybe we can never get back to that level again, but it would be fun to try.

Joe Meckoll, Los Altos, Calif.

Competition free flighters have inbred this branch of the hobby until it is too much for the rest of us. But why don't we build the sport and have fun? Obviously we complainers lack motivation, or are too lazy. As to giant FF contests in the past, that was when FF was big and radio control did not exist. All that Joe states about difficulties of finding and entering contests is true. We agree with his simple proposed rule—many people in the past have suggested the same or similar things, including the great Jim Walker.

—Publishers.

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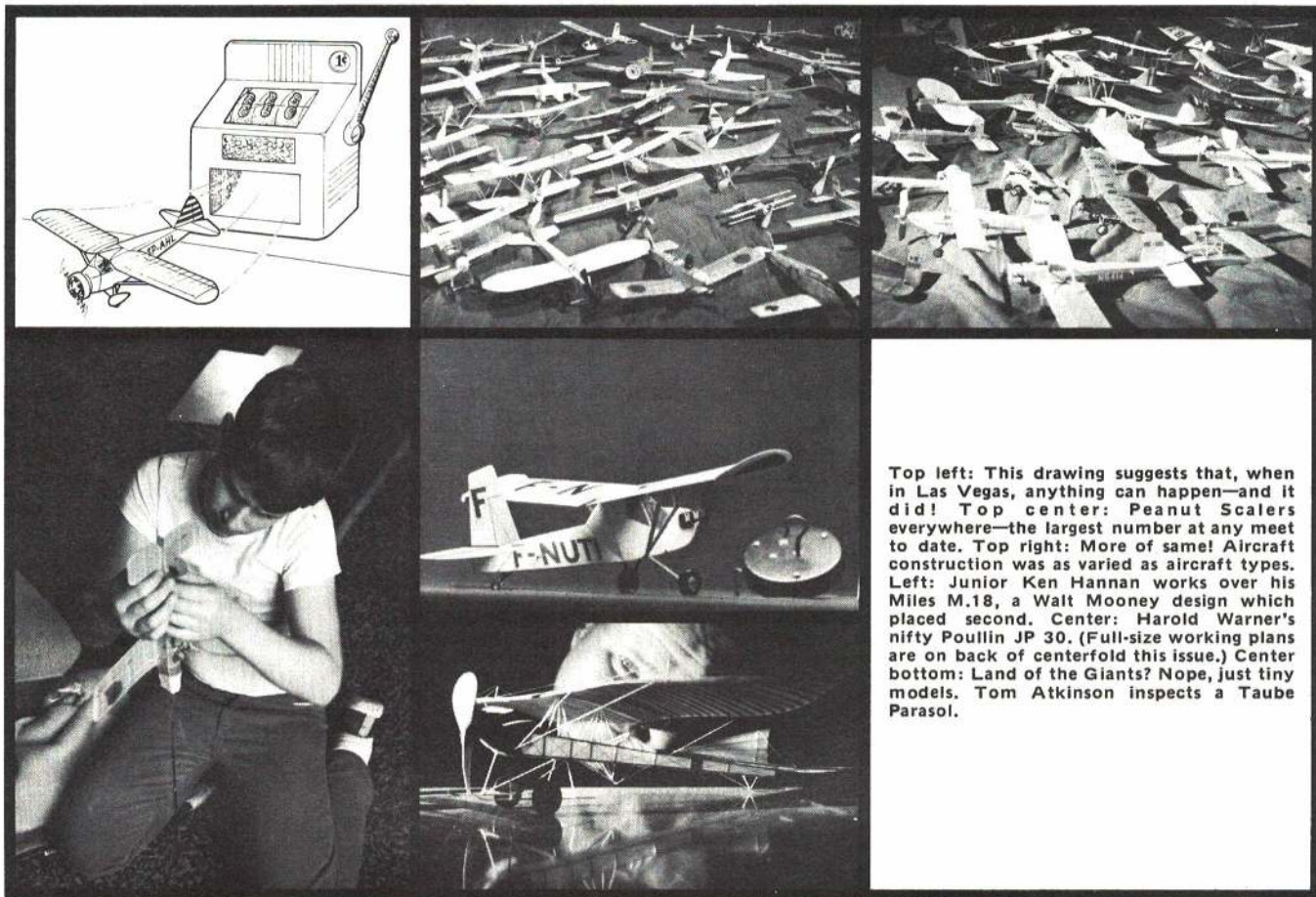
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They're NEW!



Top left: This drawing suggests that, when in Las Vegas, anything can happen—and it did! Top center: Peanut Scalers everywhere—the largest number at any meet to date. Top right: More of same! Aircraft construction was as varied as aircraft types. Left: Junior Ken Hannan works over his Miles M.18, a Walt Mooney design which placed second. Center: Harold Warner's nifty Poullin JP 30. (Full-size working plans are on back of centerfold this issue.) Center bottom: Land of the Giants? Nope, just tiny models. Tom Atkinson inspects a Taube Parasol.

GAMBLING FOR PEANUTS—IN LAS VEGAS

by BILL HANNAN

YOU REALLY CAN'T put a price tag on fun! The Third Annual Las Vegas Peanut Scale Meet wasn't intended originally to be a pylon race at all. However, on the scheduled day, unanticipated fierce winds and temperatures colder than Eskimo topless dancers in an air-conditioned igloo made any sort of free flight event out of the question. Since several contestants had driven all the way from Los Angeles, postponement didn't seem appropriate. Air Force hangar space was being used to protect real aircraft from the elements. As for high-school gyms, who can find a school janitor during New Year's vacation?

Finally, someone suggested holding a round-the-pole tether line contest—a common club activity in England, where limited space and inclement weather are usual. Never daunted by ignorance of how to set up such a meet, we requisitioned the largest room available on short notice, Chuck West's workshop. Chuck's father donated a sturdy surveying transit tripod, which became the duty pylon.

Picture a room, 21 x 21', equipped with a few chairs, half a dozen RC models, an RC

boat structure, an assortment of free flight models, an enormous uncompleted NC-4 flying boat structure, and two chandeliers. To this crowded scene, add approximately twenty modelers and spectators, plus more than 40 Peanut Scale models, and you'll have a general idea of the intimate conditions! Those who didn't know everyone when they arrived, did when they left. Howling winds prevented even such simple actions as moving some of the larger RC models to another location. Contest rules also strongly recommended that each contestant wear a New Year's Eve party hat, which certainly reinforced the effect of a room full of nuts!

The highly-adaptable Las Vegas hosts hastily formulated a set of rules to deal with the new situation. Plenty of trophies (Planters Peanuts banks mounted on hand-crafted bases) and merchandise contributed by the Williams Brothers, not to mention the coveted Pompeian Millhouse award, made it logical to set up several events, including duration, realism of flight, and speed.

Modelers were given the option of an ROG start (for extra points) or a hand launch. Since the aerodrome floor had plush

carpeting, a small takeoff pad was provided. When several models landed on this place, the always-ready officials initiated extra points for a spot landing. These rules required slight clarification when one scoundrel discovered that he could force-land his ultralight model on the pad by the simple expedient of blowing mightily on it from the top as it passed over the spot!

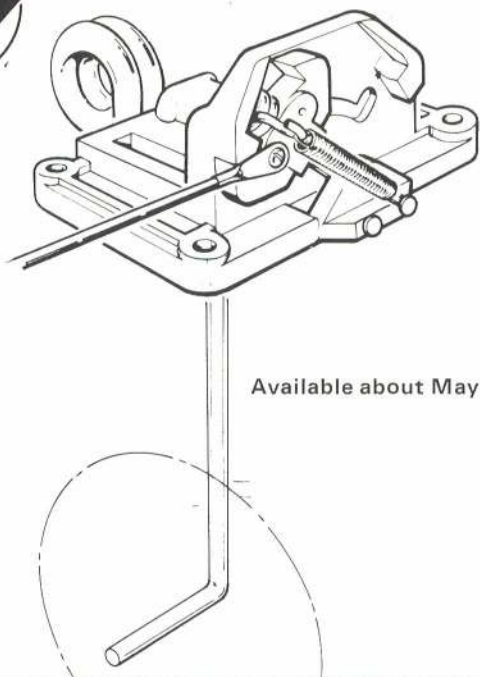
Wild aerial antics by some models quickly led to the creation of an aerobatic event. Thus, the unlucky modeler who pranged his entry against a chandelier could take some comfort in accumulating a few points for "spectacular flight interruption"! For the guy who whip-stalled into a tail-slide right onto the spot-landing pad, extra points wisely were recorded secret ballot style, to forestall protests. No one really knew where he stood at any given moment, which contributed to the overall suspense and fun.

Almost any scale contest has at least a few "semi-scale" (to be charitable) models, which causes grumbling among the more dedicated scalars. The Las Vegas group, veterans of all types of contests from Peanut to RC pylon,

(Continued on page 64)



CARL GOLDBERG



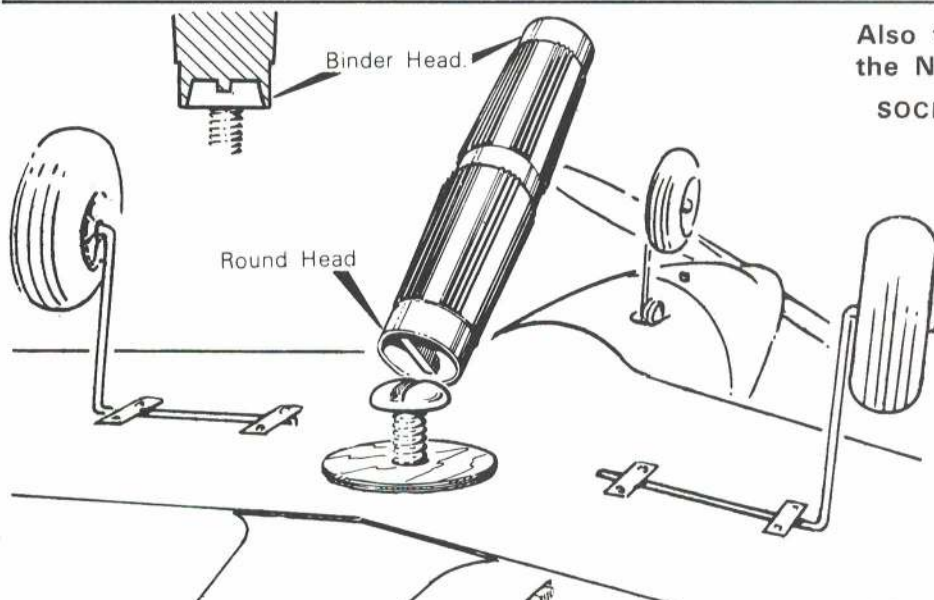
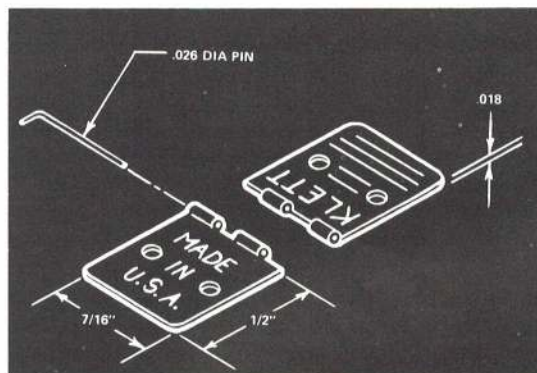
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PHANTOM &

by BILL SUAREZ

THE NAVY'S BLUE ANGELS have opened a new chapter with not only a new show but also a new plane: the McDonnell Douglas F-4 Phantom II. However, long before the Blue Angels ever received their Phantoms, I formulated the idea for a model of this ship.

With two P-38's behind me and experience in semi-stunt, I was looking for a new subject. It had to be impressive, easy to identify, have a trike gear, and be original to the Stunt event. The free world's most successful jet fighter, the Phantom II, was the answer. When the Blue Angels received their Phantom a few seasons later, my choice proved to be right.

After much thought and a little experimentation, I concluded that such items as gigonda (super-large) air inlets, anhedral-high-sweep stab, and dog-tooth leading edge could be included if the right combination of variables were determined. The large inlets are possible because of the relatively slow velocity of a stunter and the air vortex created by the prop blast. Placing inlets in already disturbed air makes an insignificant difference in drag.

The wing was designed with the ability to flex, thus allowing the airplane to turn a smooth tight corner and maintain stability. This old concept is a good one. The dog-tooth leading edge acts as a fence, preventing airflow from slipping outward toward the tips, and thereby maintains good lift on a high wing-sweep stunter.

Since realism also was one of the goals, the cockpit is strictly military and not like something out of "Star Trek."

Make no mistake, the model presented here is a true contest performer, capable of flying the AMA pattern to the book. It is impressive not merely by virtue of its shining blue and yellow dope. Although much of the spectator appeal lies in the fact that Angels fly Phantoms, this model probably would fare just as well with many of the other paint schemes. The Air Force Thunderbirds also fly Phantom II's now—another exciting possibility.

My Phantom model was ill-fated at the 1970 Nationals. During practice, the down line (flying cable) broke, resulting in a heavily damaged stunt ship. Only with the unending help of my partner, Guy Fletcher, in making repairs in the midnight hours was it possible to fly the ship on qualification day. It missed placing by three points, but it did receive 32 appearance points—not bad for a damaged airplane!

Construction

Wood selection is important. Choose strength where necessary, but use the lightest



& CRUSADER

by VIC MACALUSO

WHY THE CRUSADER? Stunt has come a long way since the Barnstormer and Profile Mustang, and today's trend is toward larger, more realistic aircraft. Seeing all the semi-scale stunt ships at the 1969 and 1970 Nats convinced me that scale-like planes are going to be around for quite some time. For that reason, I've switched from the Classic stunt ships, such as the Nobler, Smoothie, etc., to designs like the Crusader.

The Crusader was chosen because of its unique look, high wing, ventral fins, Sidewinder missiles and drop tanks—all things the ordinary stunt flier would not consider. Something completely different was what I wanted, but could it be made to fly? If a low wing with dihedral could be flown successfully, why wouldn't it also work upside down? Thus the Crusader was born.

The plane's construction is kept fairly simple through the extensive use of hollowed balsa blocks and box-type construction of the fuselage, balsa sheet for the tail surfaces and flaps, and a slightly modified foam wing. By paying particular attention to the selection of light wood and hollowing out the blocks as much as possible, the plane's weight should be 50 to 52 oz., about right for a good 35 engine.

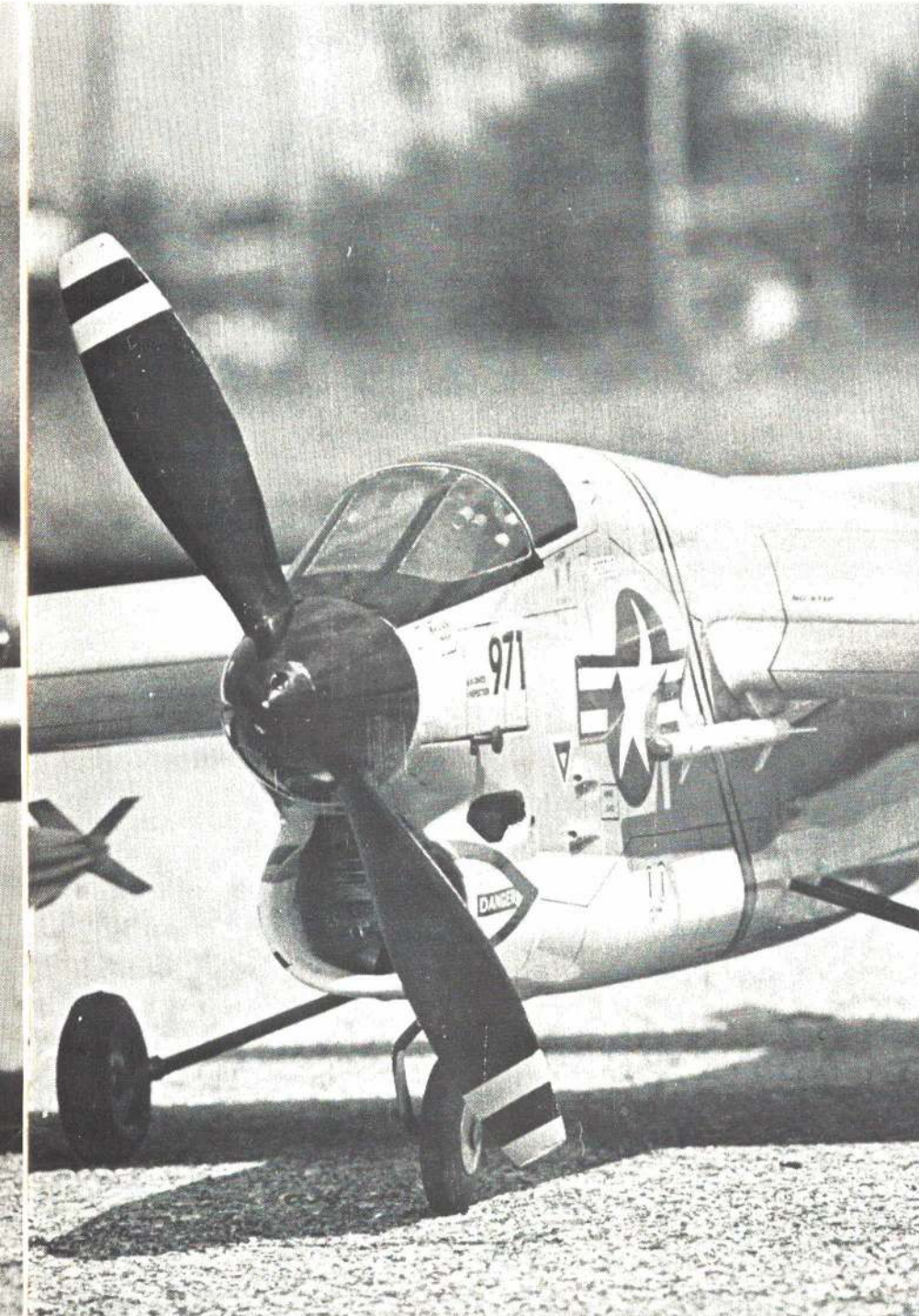
Construction

Epoxy was used for laminating the nose section and for installing the motor mounts and wing; white glue was used for most of the other construction. However, the choice of glue or epoxy is up to the individual.

Fuselage: Cut the fuselage sides from 1/8" sheet balsa and the doublers from 1/16" plywood. Glue the doublers to the fuselage sides. Next, cut 1/2 x 3/8" hardwood engine mounts to the proper length and cement them to the fuselage sides where indicated. Engine mount location must be exact because the thrust line with the anhedral wing can be critical.

While the fuselage sides are setting up, cut out formers F-1 through F-5. Draw a vertical centerline on all formers and a straight line on the work table. These markings will aid in aligning the fuselage during assembly. Cement F-1 and F-2 in place. Using their centerlines, line up the formers on the table and align the fuselage. Hold in place until set.

Glue in the remaining formers and again use the lines on table to align the fuselage structure. Hold in place while the assembly dries. When completely set, drill engine mounting holes (for a Fox 35) and install blind nuts to the top of the engine mounts. Install the engine, extension shaft, and spinner.



Photos by Bill Boss

Two consistent contest-winners, these semi-scale stunters are based on the Navy's best current jet fighters. Should be most effective at the Nats.



Overall view of Phantom shows mirror-like finish and built-in leading edge steps.



Exhaust pipe simply made from spray can tops. Rudder off-set also evident.



Even simple cockpit detail attracts attention. Fuel line filter always kept handy.

Phantom Continued from page 14

wood where strength is not a must. Although the model will fly well at higher weights, the best performance can be obtained at about 47 oz. Sig balsa was used throughout and is recommended.

Start wing construction by shaping the ribs. Place 11 rib blanks between templates W-1 and W-12A and then carve and sand them to contour. Discard the 5 outer ribs. Ribs for the outer panel are developed by placing 5 rib blanks between W-7A and W-12A. Shape and contour as before. Next, produce W-1, W-7A, and W-12A in 1/16" balsa.

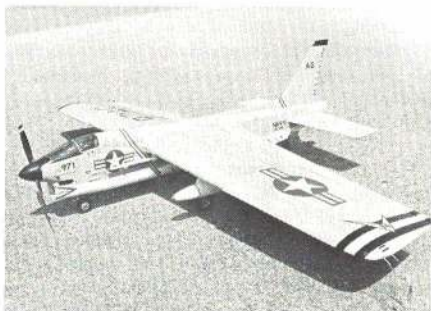
All ribs for the outboard wing can be duplicated from the first set (note that W-12A is omitted on the outboard wing). Finally, form sub-ribs W-S1 and W-S2, using the leading section of W-7 and W-7A, respectively.

Pin down the trailing edge to a flat building board and glue the ribs in place, making sure that each one is straight. Carefully notch the ribs and add spars. The main leading edge is fitted to the wing by allowing it to pass through the ribs of the outer panels. Trim, as necessary, the main leading edge and fit the minor leading edge to the wing.

Next, add the trailing edge top plank and cap. Install the bellcrank platform and add the control system. Leading edge planking is done now, by cutting the planking at the dog-tooth edge only as far back as necessary to match rib contours of W-7 and W-7A ribs. Check for warps and steam them out if they occur. Plank the center section and add cap strips.

Glue wing tip blanks in place and carefully shape them. Remove the tips and hollow out. Add a 1-oz. weight to the outboard wing tip and glue the wing tips back in place.

(Continued on page 72)



It is the fine detailing that makes this model look like the Crusader. Takes patience.



Rear view shows wing's anhedral, unusual ventral fins, drop tanks and rockets.



More of that beautiful detailing. This is a much-flown model kept clean and waxed.

Crusader Continued from page 15

Next, build up the top, bottom and tail of the fuselage by tack gluing a 1 x 2 1/2 x 36" block to the fuselage top. Permanently glue a 1 x 2 1/2 x 20" block on top of the 36" block at the nose end to provide sufficient thickness for the cockpit area.

The fuselage bottom is formed from a 1 x 2 1/2 x 36" plank cut as shown at former F-3. Tack glue the bottom blocks in place. Using the plans as a guide, shape the fuselage as shown in the top and side views. Pay particular attention to the contours in the cockpit area, which will be used later as a

mold for making the canopy. When all carving and shaping is done, pop off top, bottom and tail blocks and hollow out as indicated by the dotted lines. Hollow as much as possible for the lightest structure.

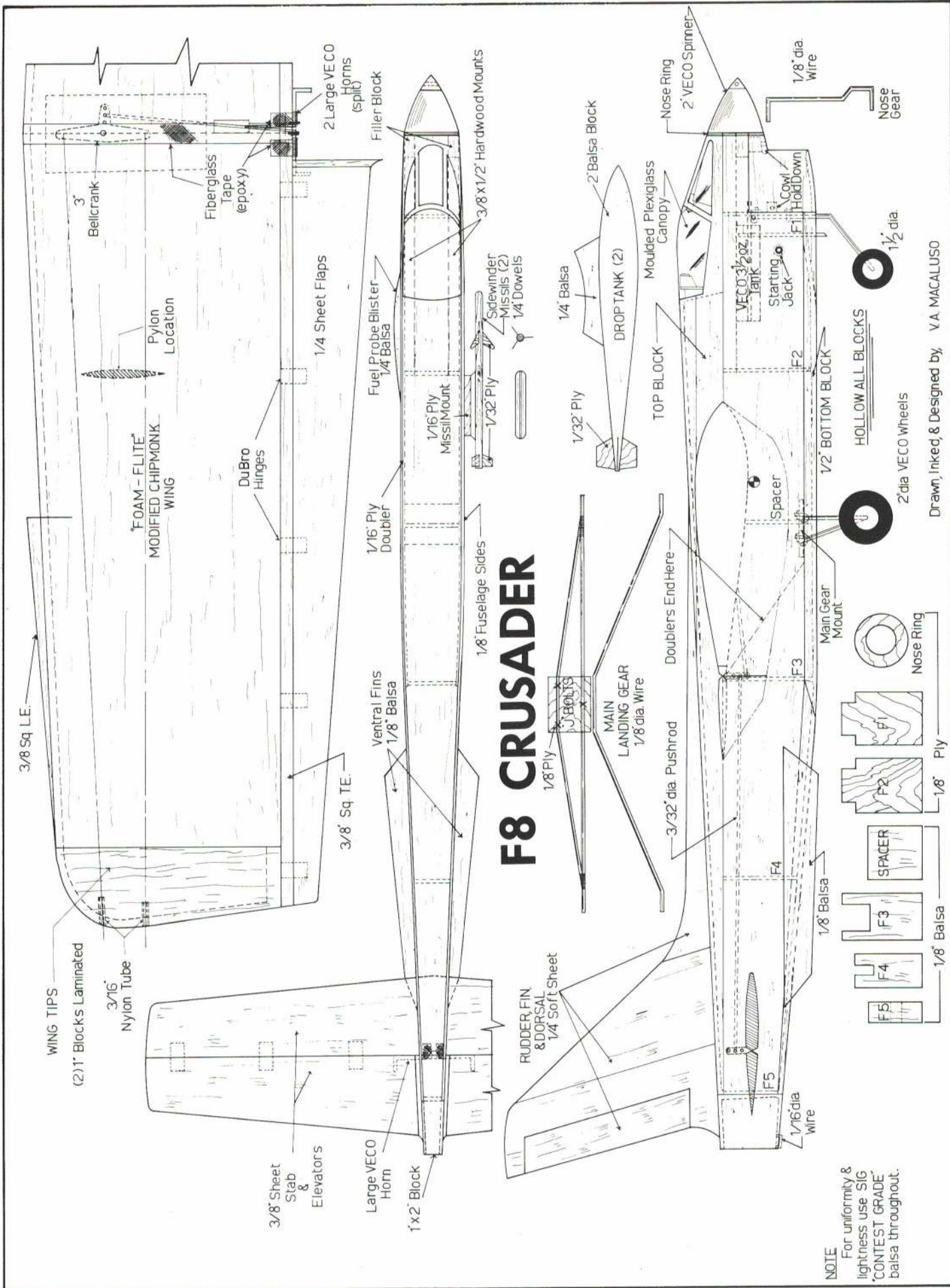
The landing gear is made up next and installed. Attach the nose gear to former F-1 with J bolts. Mount the main gear on a 1/8" plywood plate and install it in the fuselage.

Wing: The wing was made from a Chipmunk wing (Foam-Flight Wings, 628 W. 6th St., Mankato, Minn.). Start construction by sanding the anhedral angle in the root of each panel. To achieve the proper angle, place

the root of each panel at the edge of a straight table or work bench and block up the other end of the panel (before wooden wing tip is installed) 1 3/4" off the table. Holding a coarse sanding block exactly vertical, sand across the wing root until the proper angle is obtained.

Before the wing sections are assembled, install the 3" bellcrank and leadouts in the correct inboard panel. For mounting the bellcrank any of the several methods suggested on the instruction sheet with the wing kit may be used. After the bellcrank and

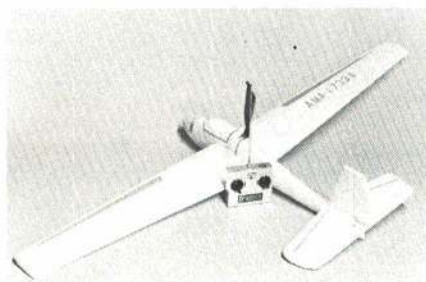
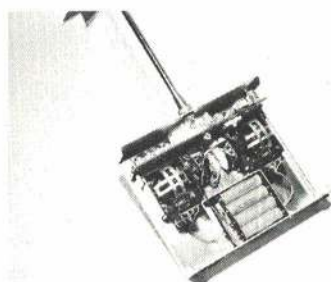
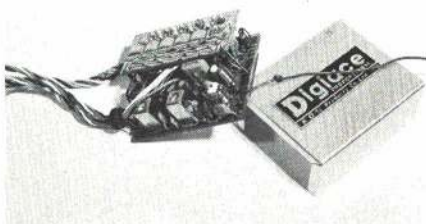
(Continued on page 72)



Drawn, Inked, & Designed by V.A. MACALUSO



DIGIACE-4 FLYING A CANYON SCHWEIZER



Upper left: Test system flown with cheap long-lasting dry batteries. NiCads are available.

Center: Tough glass-epoxy PC boards are used. Case is heavy aluminum for protection.

Above: Amplifier is conventional circuitry and gives quick servo movement. Note robust gears.

Far left: Transmitter PC board layout is neat and quite compact. Kraft-like sticks used.

Near left: The Schweizer and its radio are a fine beginner's combo for multi RC.

THE DIGIACE SYSTEM is manufactured by KO in Japan, where it has developed a good reputation. However, to my knowledge, it has not been marketed in this country before.

Meanwhile, Herb Abrams added a pleasant segment to RC history, creating a fantastic resurgence of pulse radio control. He developed the Rand LR-1, LR-2, and LR-3 actuators, which took most of the gallop out of galloping ghost. This was followed by the bridge amplifier-relayless Rand Pack; the pulse width, pulse rate control Rand Dual Pack; and finally a stick assembly. All of these required mastery of machine design and plastic molding.

Then, about three years ago, Rand was sold to ACE RC and Herb Abrams returned to the automotive field. Now he's back in RC, importing the Digiface system and operating as Rand Sales Co., Columbus, Ohio.

The main feature of the Digiface-4 is that, at its introductory price, it is the least expensive four-channel system with four servos which can be purchased ready to operate. The system tested is the standard four-channel system which uses dry cells throughout. A total of 12 pen cells is required. The system consists of a two-stick transmitter, the receiver, four servos, and switch harness and battery holder.

The transmitter is housed in an aluminum case, 6 3/4 x 5 3/4 x 1 3/4". A significant similarity exists between the stick assemblies

and Kraft sticks. An eight-cell (12V) battery holder is provided. The printed circuit board is firmly mounted in nylon clips attached to the stick assembly and restrained by integral attachment/mounting of the power switch. As a novel feature of both the transmitter and receiver switches, a white dot clearly indicates when the switch is on.

Electronically, the transmitter is fairly straightforward. The frame rate is set by a free-running multivibrator whose repetition rate can be varied by a trim pot from around 16 to around 30 frames per second. The free-running multi generates the reference pulse (synchronization pulse), and the remaining four pulses are generated by four of the familiar single transistor half-shot multivibrators. The PC board has provision for addition of the fifth channel. All stages of the RF section are tunable, i.e., the oscillator, and interstage network, an antenna tuning for the 50-in. base-loaded antenna. RF output is indicated by a meter.

The single RF output transistor used is equipped with a heat sink. It does not run at all warm, even with the antenna removed. The transmitter power drain is 50 milliamperes. The transmitter weighs a comfortable 2.5 lb.

The receiver is a two-deck affair using stable, well-proven circuitry. It is enclosed in an aluminum case 1 3/4 x 1 x 2 1/4". The receiver uses a double tuned front end, followed by three stages of IF, squaring stages

which create the clocking pulses, and synchronization hold-off to be fed to the decoder. The decoder is somewhat unique in that it uses a two transistor flip-flop per stage (channel) in a ring-counter configuration. This is the common approach used in IC decoders. However, most transistor decoders have used the transistors in an SCR-type connection. In any event, the Digiface decoder is extremely stable and has good noise immunity. Receiver weight is 3.0 oz.

Wiring termination is to a three-plug terminal block for rudder, elevator, and motor. Separate plugs are provided for power and for aileron. Inside the receiver, the cables from these three plugs terminate on the decoder board. As indicated earlier, the switching harness and a four-cell battery holder are provided. All plugs are four pins and coded to prevent inadvertent misplugging.

The servos are 2 1/8" long, 7/8" wide, and 1 5/8" high (to top of wheel output). They have wheel output only. Servo weight is 1.8 oz. each. Electronically, the servos are quite conventional. A two transistor one-shot multivibrator controlled by a feedback pot provides the reference. Input and reference are compared by a resistor network, followed by pulse stretchers and drivers for clockwise and counterclockwise drive. The Mitsumi motor is used, as in most American-made servos.

(Continued on page 87)



by PAULINE ZOBER



Assembly of the Alpha began with mixing the Hobbypoxy glue and applying it to the dihedral joint. A messy job at best, but here it is done quite delicately.

THIS STORY BEGINS last spring when I first saw the Dee Bee Alpha fly in an impressive performance at the Suffolk Falcons' Winter Fun Contest. As a free-lance model designer and writer, I was interested in doing an article on this ship. Don Brown gave his okay and two months later the Alpha kit arrived.

It was quite a package and as I was going through all the goodies my wife, Pauline, arrived on the scene.

"What have you got there?" she asked.

"Don Brown's new ARF kit," I answered in an offhand manner.

"It's a what kit?"

"An ARF kit."

At this point, Pauline exclaimed indignantly, "Are you clearing your throat or are you barking at me?"

A word of explanation definitely was in order, "No, dear, the word ARF is an abbreviation meaning almost ready to fly. Got it?"

We both began to lay out the parts from the kit on the dining room table. For the first time in our married life, Pauline was showing a real interest in a plane, so I told her I planned to build the model and do an article on it.

Then she floored me. Right out of the blue, Pauline exclaimed, "I'll bet I could build that!"

When asked if she really meant what she'd just said, she replied, "For 16 years, I've been fighting this hobby of yours and I know it's a losing battle, so it's time I joined you."

And that is why this article is titled, "If You Can't Beat 'Em, Join 'Em." What follows is my wife's commentary as a first-time model builder and flier.

Hi, fellows! I hope you won't mind a gal getting into your act. But after being married to a model builder all these years, my resistance has been worn down. When I saw that eye-catching kit, the bug really got to me.

The ARF Alpha was quite a kit. It came in a sturdy package, with the parts securely nested in place. Wally checked them all and found them to be excellent quality. The wing cores or wing halves were in the styrofoam blocks from which they were cut. All those little fittings were in a plastic bag and the trimming on the formed plastic parts was neatly done. The wings and stab were covered with a smooth semigloss white plastic sheet (the rudder-fin was part of the fuselage).

After familiarizing myself with all the parts and learning their proper names such as fuselage, wings, rudder, ailerons, landing gear,

etc., I laid out the kit on my kitchen table—that's my work bench. Wally told me this was my project and that everything needed to build the kit was there. "What about the tools?" I asked.

He grudgingly replied, "I'll let you use mine, but when you're through, be sure to put them back into my tool box, not in your kitchen drawer!" (I wonder why he said that?)

Now I was all set to start—after asking my husband to leave. The first thing I did was read the instructions carefully. I won't go into step-by-step construction details since the Dee Bee booklet is complete and helpful. The fuselage came as two vacuum-formed halves, trimmed by the manufacturer. I joined them by applying welding fluid (MEK) sparingly with an artist's camel's-hair brush. An excess of the welding fluid would have dissolved the plastic.

The motor mounts, bulkheads and firewall are already installed. I had to seal them to the



A sealing iron is used to MonoKote the control surfaces. (You didn't think she'd use a clothes iron—did you? It's too heavy.)



If you build it, you start it! Electric starter was appreciated. Wally adjusted needle valve, Pauline got to hold the plane.



fuselage sides to prevent fuel from creeping into the radio compartment. Wally recommended G.E. Silicon seal because it is fuelproof and sticks to the plastic. It was a little messy to work with but it did the job.

The most critical part was joining the wing halves. If they came apart in the air, I'd be in deep trouble! I used Hobbyoxy Formula II and plenty of it. The dihedral brace slots were well-coated with epoxy, as were the foam core ends. I coated the plywood brace and inserted it in one wing half. The other wing half slid over the brace and made a firm contact of foam core butt surfaces. Masking tape around the dihedral joint prevented the epoxy from running out while it set. The dihedral angle is slight, so I had to double-check its alignment. Who wants an airplane with drooping wings?

One change on the rudder-fin was made at my husband's suggestion. I placed a 1/4" sq. post in the rudder-fin and epoxied it in place. This stiffened the rudder-fin and allowed the use of plastic hinges. The only trimming that had to be done on the Alpha was the cutout for the engine installation and for the radio compartment. I used a sharp razor and cut slowly because this plastic material is really tough. But with care, I had no problems.

I started this kit on a Sunday afternoon and, working on it in my spare time, had it finished the following Wednesday. An experienced modeler probably could build it in a day. The only thing I did not do was install the electronic equipment. Wally did that—something to do with CG location.

Then the big day finally arrived! I was going out to fly! Wally loaded the station

wagon with the Alpha, field box, transmitter, fuel can, starting battery, electric starter, and me. Off to the field we went.

I was hoping and praying that none of my husband's club members would be there. I was nervous and I knew an audience wouldn't help any. Luckily, the field was deserted, so I felt a little more at ease. The pre-flight check of the Alpha and the equipment began.

We range-checked the radio, since it was a new rig. I filled the tank with fuel, attached the starting battery connector to the glow plug, and put the electric starter to work. The Enya 60 came to life with a roar. Wally throttled the engine back, made a few final adjustments with the needle valve, and said we were ready to go.

He taxied the Alpha out to the middle of the runway, gave everything one more check with the engine running wide open and with me holding the tail (I get all the good jobs—like getting covered with fuel exhaust)

and then he gave me the go-ahead. I let the Alpha go and in a matter of seconds it was airborne.

Wally took the Alpha up to what he thought was a safe altitude, made a few trim adjustments, and then I heard him say, "Okay, honey, it's your turn." For a moment, I froze, then I heard him call again, "Come on, it's flying beautifully." With that he handed me the transmitter.

"Make a turn to the left," he said. I pushed the aileron controls to the left and the Alpha did a roll. "You're over-controlling! Relax and try it again." This time the Alpha turned beautifully, but I lost a little altitude. I advanced the throttle and the Alpha began to climb. I regained the altitude I lost and throttled back to cruising speed.

I asked my husband if I could try a loop. He said, "Why not!" So I advanced the throttle, pulled back on the stick, and the Alpha looped with ease. I was having a ball. I made one more figure eight, then the engine quit because it was out of fuel. Wally took the transmitter and made a dead-stick landing. That was the maiden flight of the Alpha.

Before I sign off, I'd like to say that you fellows have a good thing going in this hobby of yours and I can see why you enjoy it so much. The building is relaxing and the flying certainly is exciting. So, to you wives and girlfriends of modelers, my advice is "Don't fight 'em, join 'em."

Note from the modeler's husband: My wife did a professional job in building this aircraft. As a matter of fact, my flying buddies suggested that she build all my models!

The Harrier—Needs No



Five RAF Harriers cruise in formation. U.S. Marines also will use this ship.

AIRPLANES ARE GREAT—but who needs airports?

Airplanes need them, of course, and it's a real problem. Airports take up hundreds of acres of land, with only a few narrow strips of it in actual use. The convenient ones are being gobbled up and turned into housing projects, while new ones big enough to handle the latest types of airplanes are so far out of town that the people in charge are seriously talking about building railroads for access to them.

Nearly everyone has ideas for solving the problem, but the simplest solution would be to get rid of runways, so that airports can be small and convenient. This is accomplished by developing airplanes that take off and land straight up and down. Simple, huh? So simple that it appealed to the first man who seriously thought about making a flying machine, none other than Leonardo da Vinci, back in the days when Christopher Columbus was sailing West to find the East.

Leonardo worked on ornithopters, parachutes and helicopters—all of them for mainly flying up and down without first having to run along the ground for a mile or two. None of the great Italian's designs ever got off the drawing board, as far as we know, and there is good reason to doubt that any of his farsighted designs for man-powered flight would have flown.

A mere 450 years later, Igor Sikorsky and Gerd Achgelis combined ingenuity with modern engines to produce the first workable helicopters. This giant step led to great things, but not even several decades and billions of dollars have been able to make the helicopter go very fast.

If a machine that goes straight up won't go fast, why not take a fast machine and make it go up? This challenge caught the imagination of many engineers some 20 years ago, and the novel concepts flowed like light oil. Convertiplanes with folding wings or folding rotors. Airplanes with rotating engines and swiveling wings and tilting propellers. And the most amazing conglomeration of flaps and slots and slats and gadgets of all manner. Money poured in, and the props/rotors/fans went around, and sometimes the things got off the ground. But mostly they made a great deal of noise and didn't go much of



Rising vertically from a dirt field, a Harrier displays military flexibility.

Nozzles swiveled downward, this Harrier hovers on takeoff. Field is just a pad.



Huge air scoops feed the 19,200-lb. thrust Bristol Pegasus. Top is supersonic.



Runway

With the world's first VTOL fighter squadron in operational service, the Hawker-Siddeley GR Mk. 1 may also be built by Mc Donnell-Douglas.

by DON BERLINER

anywhere. And even when they worked, they were so expensive to operate that nobody would have bought one, so they never went into production.

Still people tried, for if the extremely complex problems of control and safety and economy could be solved, aviation history would be made. From each unsuccessful attempt came further knowledge and the increased conviction that the idea eventually would work.

One of the ideas was for vectored thrust and came from a French engineer, Michel Wibault. In 1954, he proposed an aircraft with multiple jet exhausts which could be directed anywhere from straight down to straight back. His own government failed to show interest, so he offered the idea to the U.S. Mutual Weapons Defense Program, which turned it over to Bristol Aero-Engines Ltd., in England, for research.

While the hardware underwent major changes, Wibault's principle remained the same. In 1957, after the idea had come to the attention of the late Sir Sidney Camm, designer of the Hawker Hurricane, and then head of Hawker Aircraft (now Hawker-Siddeley) things began to jell. By late 1957, the shape of the Hawker P. 1127 had been placed on paper. It would be powered by an 11,000-lb. thrust Bristol-Siddeley BS.53 Pegasus turbojet and a pair of swiveling nozzles on either side of the fuselage would point down for takeoff and landing, and back for flight. The basic shape was set for the entire family of VTOL fighters: short, highly tapered wings, tandem main landing gear in the fuselage with semi-retractable outrigger wheels at the wing tips, and a big bubble canopy set far forward.

The prototype flew tethered on Oct. 21, 1960, and made its first free flight on March 13, 1961, with Hawker chief test pilot Bill Bedford at the controls. The forerunner of the Harrier worked, and it worked well. But others before it had gotten this far and then slithered to a halt. The P.1127 began as a privately financed project of the manufacturer and was given a big boost with American funds. But without orders from its own government, this promising project would go down the drain.

NATO, which had shown interest in the VTOL concept, announced in early 1961 its need was for a supersonic VTOL fighter, so Hawker-Siddeley launched its P.1154 program. However, the P.1127 was kept alive

by a most unusual move: the U.S., Britain and West Germany decided to form a tripartite (three-country) squadron. Its purpose was to study the operations of VTOL fighters by using nine Kestrels which were improved P.1127's.

The Kestrel Evaluation Squadron, which may be without counterpart in aviation history, was formed in October, 1964, and actual trials were run from April to November, 1965. More than 500 hours of flying and more than 1000 takeoffs and landings contributed greatly to the knowledge of flying VTOL aircraft in a wide variety of situations, rather than under the restricted conditions of most previous VTOL operations. The Kestrel showed it was able to do the job for which it had been designed, but no orders came in.

When the test squadron was dissolved, six of the Kestrels were sent to the U.S., where some of them became known as XV-6A and were operated by the USAF and NASA to develop V/STOL techniques and all-weather flying. Slowly the P.1127 was proving itself to be a thoroughbred and not just one more flying test-bed. Serious interest was beginning to develop.

The once-promising supersonic P.1154 got some support from the RAF, but then was dropped, to be replaced in 1965 by the next step in the P.1127 series, the Harrier. The British government acted slowly and cautiously on the radical idea, but nevertheless faster than any other government was moving. The first Harrier flew on Aug. 31, 1966, and the other five development aircraft were airborne by the following summer.

Meanwhile, the first true production order had been placed by the RAF for 77 GR Mk.1 fighter-bombers and 13 two-seat T MK.2 trainers. The first single-seater flew on Dec. 28, 1967, and the first trainer on Apr. 24, 1969. Others followed quickly, and on the first of July, 1969, the world's first operational VTOL squadron was formed. It had taken a long time, but a vertical takeoff aircraft finally was in service.

Shortly before this historic event, another chapter in the story of the Harrier was written and still is having repercussions. The \$140,000 Daily Mail Air Race between downtown London and downtown New York was seen by many as a convenient way to show off the performance of the Harrier to U.S. officials who were prospective

purchasers. RAF Sqdr. Ldr. Tom Lecky-Thompson made the long trip, including slow portions on the ground in both cities, in just over six hours, landing near the United Nations building on Manhattan Island. Thousand of bystanders were amazed, the press was properly impressed, and officials of the various U.S. air services reacted as hoped.

The Marine Corps decided the Harrier was exactly what it had been looking for and placed an order. The first AV-8A produced expressly for the USMC came off the Hawker-Siddeley assembly line in September, 1970, to be followed by 11 more in the first group and then a second. The first were scheduled to be delivered to the Naval Flight Test Center at Patuxent River, Md., in January, 1971. After acceptance trials have been completed, they will go into service with Marine Corps units operating off aircraft carriers and will be flown by pilots already trained by the RAF.

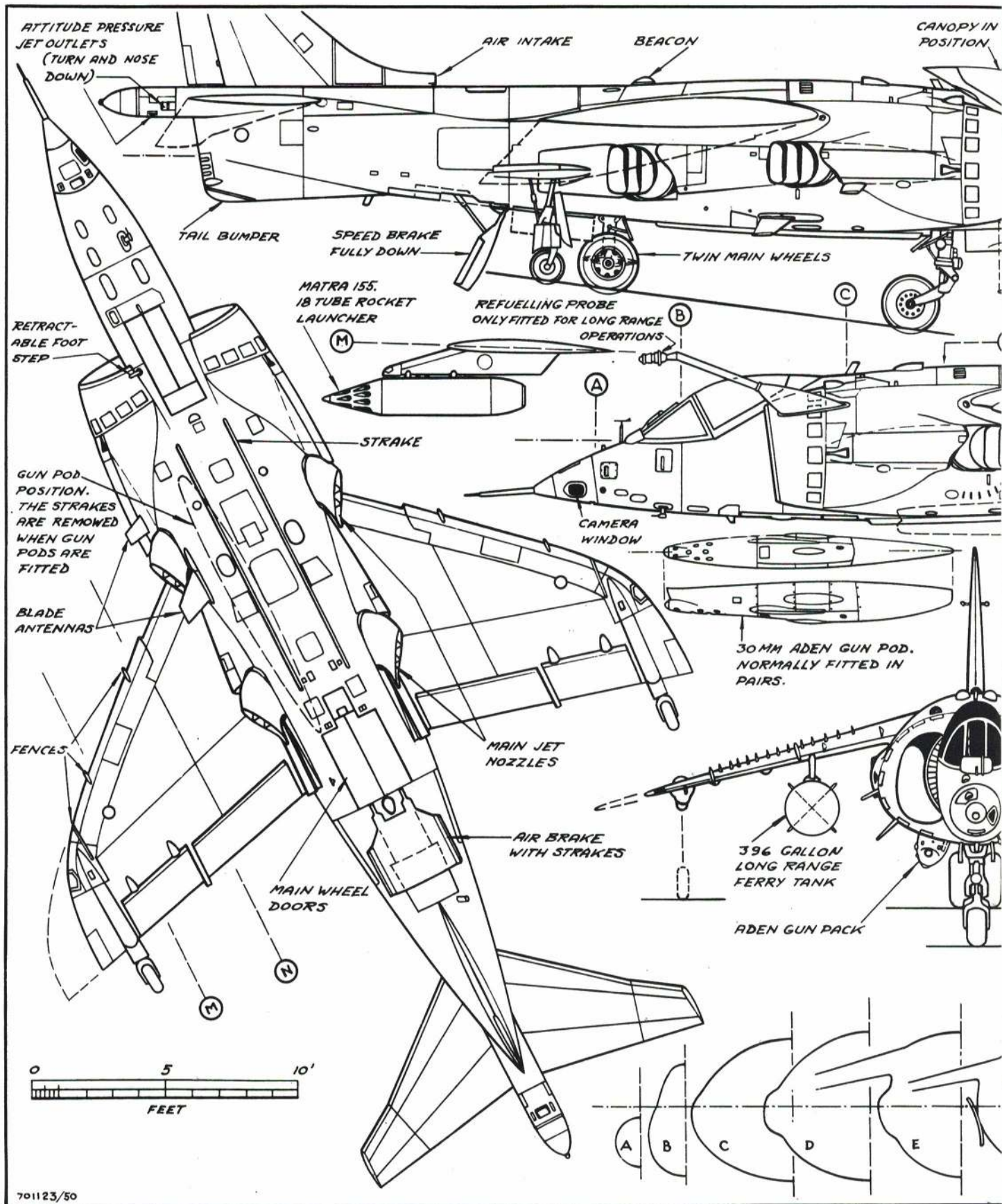
If all goes well, more than 100 additional Harriers will then be built on license by McDonnell-Douglas. Other than the English Electric Canberra, built by Martin as the USAF's B-57, the Harrier will be the only foreign aircraft put in service by the U.S. since World War I.

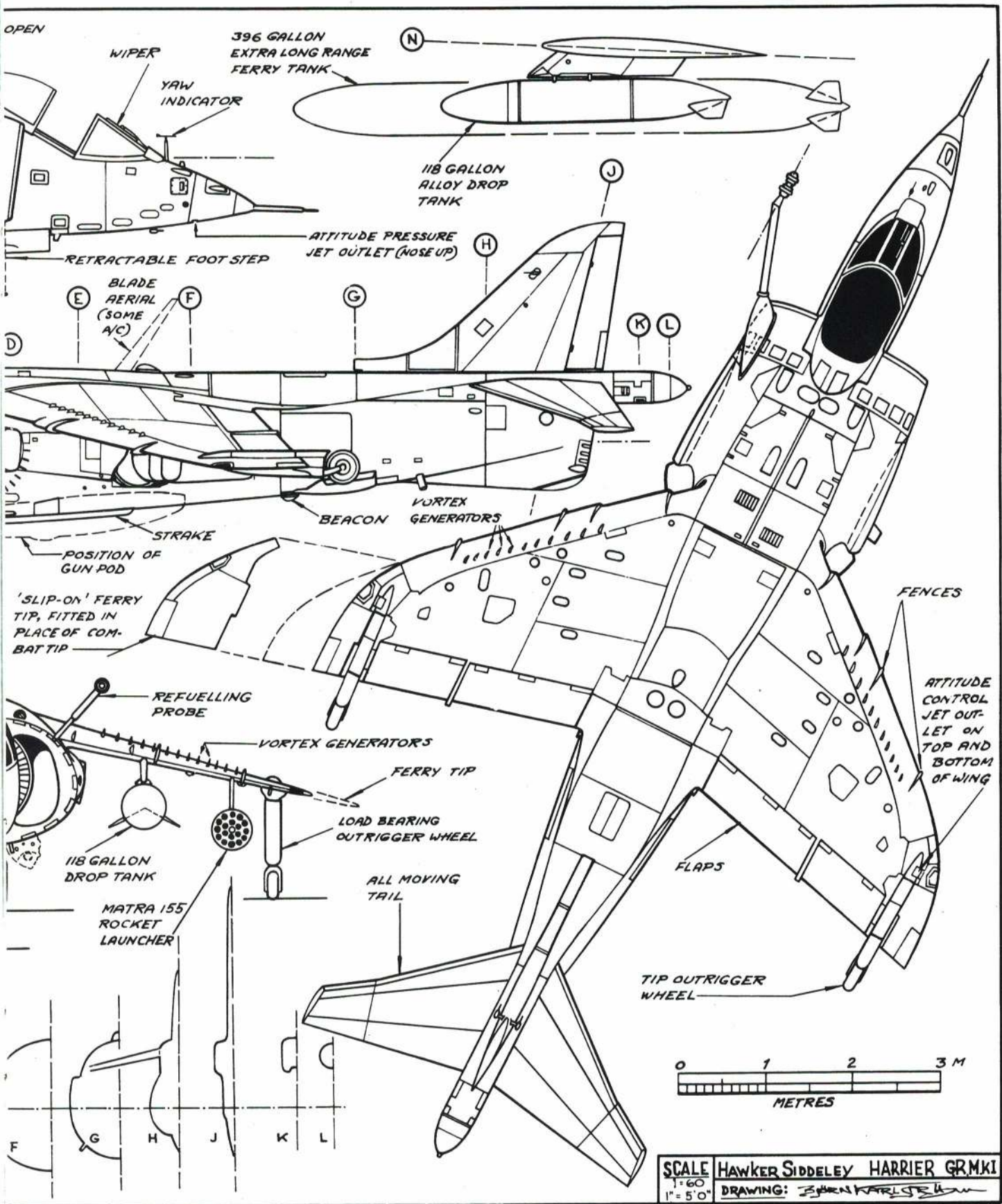
A harrier, by dictionary definition is a long-distance runner. The Harrier now making flying history is one man-made bird that doesn't have to be a cross-country runner.

Specifications: Harrier GR Mk.1

Dimensions:
Wingspan—25' 3" (29' 8" with long-range tips)
Length—45' 8"
Height—11' 3"
Wing Area—201 sq. ft. (217 sq. ft. with long-range tips)
Power—1 Rolls Royce Bristol Pegasus 101 @ 19,200 lb.
Empty Weight—approx. 12,000 lb.
Maximum Hover Weight—approx. 16,000 lb.
Gross Weight—approx. 22,000 lb.

Performance:
Maximum Speed—over 720 mph
Maximum Diving Speed—over Mach 1.25
Service Ceiling—over 50,000 '
Ferry Range (without refueling)—2300 mi.
Minimum Take Off Distance—0' 0"





SCALE HAWKER SIDDELEY HARRIER GR Mk1
 1" = 60'
 1" = 5'0"
 DRAWING: JOHN KARLIS

SIMPLE—FLY

Now that you have soloed, here is your first low-winger. Flying is mild with a 29 but wild and fun with a 45.

by STUART RICHMOND

MY TWO OLDER SONS, now 11 and 13, had been flying H-Rays, S-Rays, a Mambo Special, etc., quite successfully in competition, when they decided they wanted a hot, contest-type airplane. I agreed that they were ready for ailerons and more power.

The design concept for the new ship was simple. It was to have a minimum number of parts and no compound curves (to make covering easy). Dihedral was ruled out since it detracts from many maneuvers. A semi-symmetrical airfoil was needed for grass field takeoffs and steep landing approaches. High wing-loading was required for snap maneuvers, easy spins in either direction, upright or inverted, and for windy weather flying. Above all, the plane had to be simple enough for a youngster to build and had to groove well for simple flying in less than highly-experienced hands.

The design concept proved completely successful, and the prototype flew so well that I took it for myself. The boys had to build two more! I started with an Enya BB 29, progressed through a 35, and now all three of us fly with Enya 45's.

The Simple-Fly is a highly competitive contest or sport ship, which performs all the standard maneuvers as well as some wild ones the book hasn't even seen yet. Don't let those simple lines and that apparently drooping wing fool you. The Simple-Fly is a true joy in the air.

Construction

Build strong. The model must not weigh less than 4 1/2 lb., so don't spare the strength!

First select the engine, clean it well, and bolt onto it the two engine bearers of 1/2 x 5/8" (or larger) hardwood. Use no side thrust or down thrust. Overall width must accommodate the SS-6 fuel tank in its location. Install bulkhead A and bulkhead B, along with the nose gear mount.

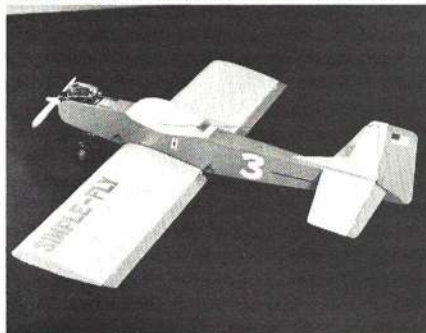
Next, epoxy the 1/32" or 1/16" plywood fuselage doublers to the 3/16" hard balsa fuselage sides. Saw or cut out the two sides. The piece of balsa cut from the bottom rear of the sides is glued on top of each fuselage side to form the cabin area. Epoxy the engine/motor bearer, bulkhead A, bulkhead B sub-assembly onto one fuselage side and line it up carefully (see plans). When set, epoxy the other side in position and align it so that all is square.

Install bulkhead C and join the two sides together at the tail. Epoxy the 1/16" plywood floor in place for the gas tank area and remove the engine. Next install the 3/16" rock hard balsa doublers inside at the wing mounting area and at the rear of the fuselage.

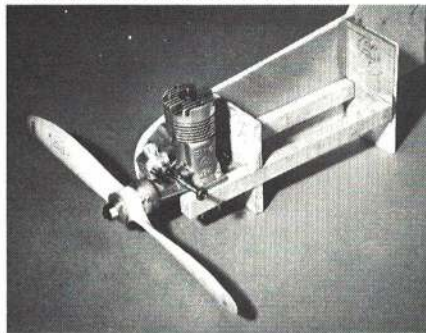
Cut out the stab and fin and epoxy in place. The stub of the fin goes down through



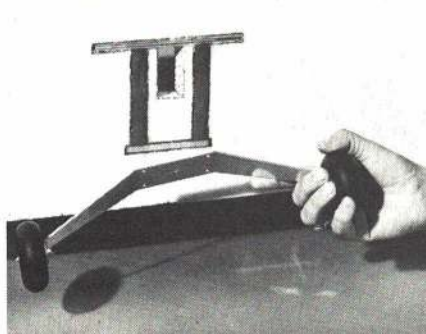
Don't let the boxy looks fool you. Does standard maneuvers, plus some wild ones.



Can't beat this! Sub-assembly of engine, bearers, bulkheads glues to fuse side.



Wing bottom before planking. Note servo cutout. Gear screws on after planking.



a hole in the center of the stab, wedges between the tail fuselage doublers, and stops at the bottom planking. Add the top and bottom planking as shown and sand well. Epoxy small strips of fiberglass cloth to reinforce all joints of bulkhead A and the area of the engine bearers forward of bulkhead A. This extra effort takes only a few minutes but provides great strength where needed.

Cover the tank area completely with epoxy, add a coat or two of colored fuel-proof dope to the tank compartment and engine area. Then MonoKote or cover as desired. Those who haven't used the plastic type of covering will find this is a perfect ship for trying it. If you goof a little, just peel it off and start again. No smell, no mess, no fuss, and what a shine!

Install mounts for the servos or servo tray (see plans or photo). Put in the engine with 4-40 bolts or larger. Hinges for rudder and elevator are added now. We use dacron 1/2A U-control lines and sew figure-8 hinges for trouble-free operation. Finally, install the pushrods.

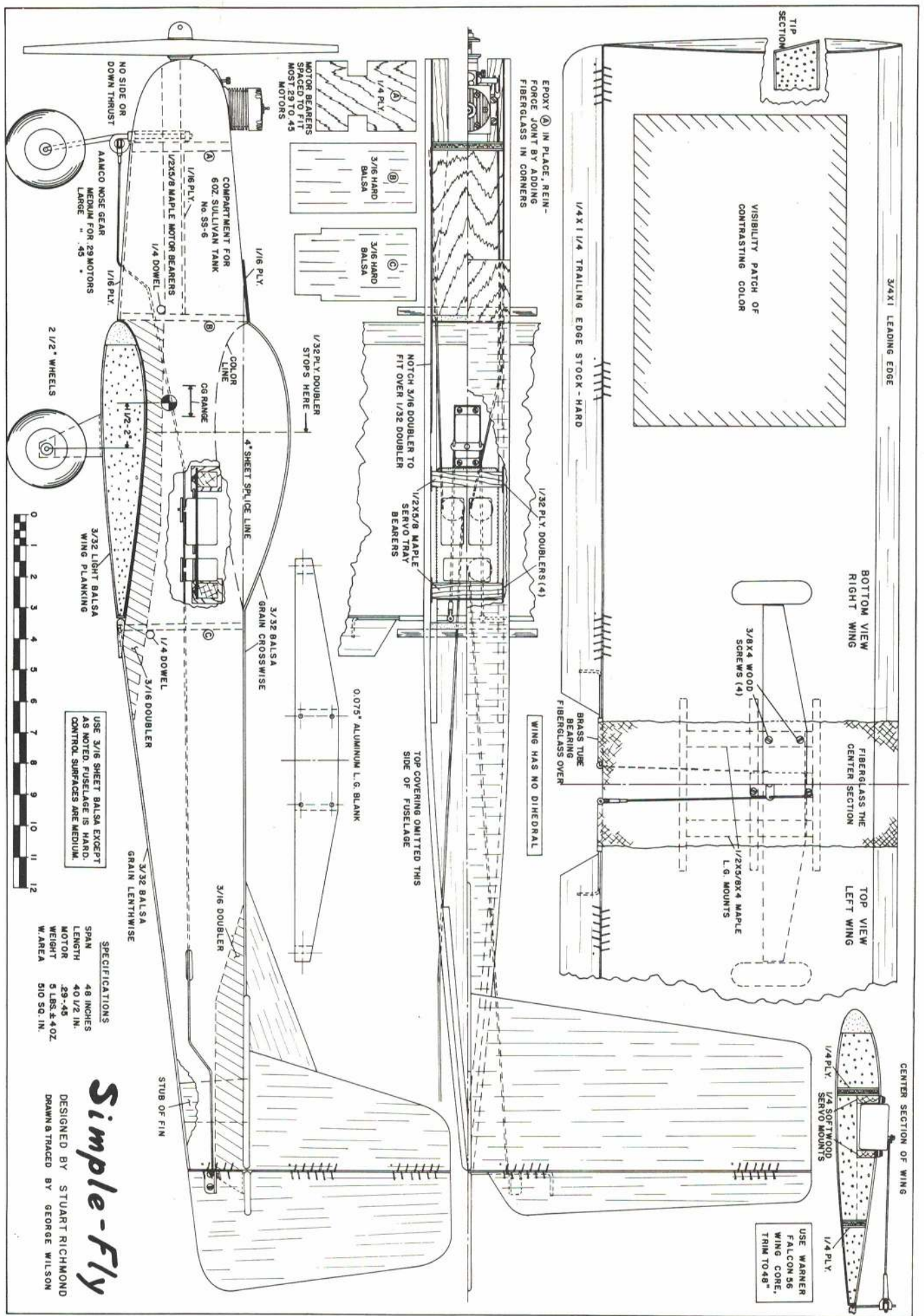
The wing is a Warner Industries Falcon 56 core (or equivalent) joined with epoxy and with a full-depth piece of 1/4" plywood. Use no dihedral in the wing. The front of the aileron servo simply screws into the top of the 1/4" plywood wing joiner. Measure the aileron servo and carefully gouge out the styrofoam to install a 1/4 x 1/4" or larger hardwood strip. The rear of the servo is screwed in place on it.

Turn the wing upside down and gouge out the styrofoam to accept the 1/2 x 5/8" (or larger) hardwood into which the sheet aluminum gear is screwed. The front of these gear mount strips is epoxied to the wing joiner. The rear is anchored by a 1/4 x 1/4" (or larger) span-wise mounted piece. Measure both the gear and the position of the gear-mounting holes and write them down. After covering, it will then be easy to attach the gear in place with 3-3/8" screws.

If the gear ever should be pulled loose accidentally, simply use the next larger size of screws to reinstall it. Trim the trailing edge of the cores according to the plans. Cover the wing with light or medium-weight 3/32" balsa, or its equivalent, 48" long. Center it carefully on the core and attach with Core Grip or a similar contact adhesive.

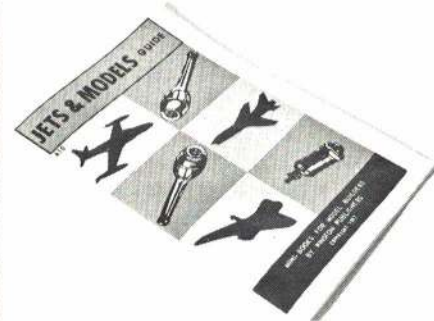
Trim the wing's leading edge to accept the balsa leading edge piece and carve it to shape. The leading edge curvature has much to do with the way the Simple-Fly performs, so be slow and careful at this point. Cut off and throw away the styrofoam which extends beyond the 48" planking on each tip. Then add the tip sheeting.

(Continued on page 87)



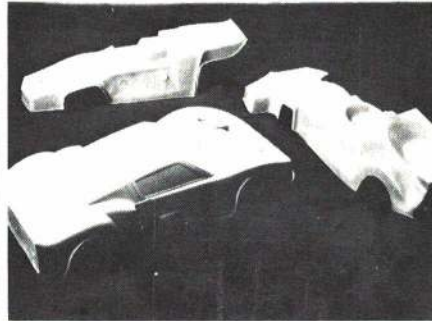
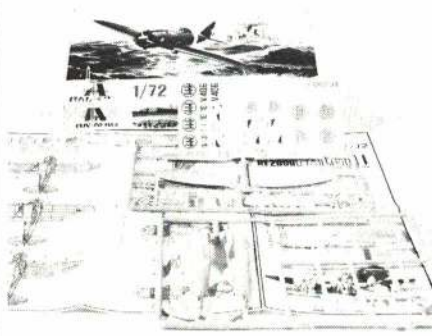
new products check list

by FRANK PIERCE



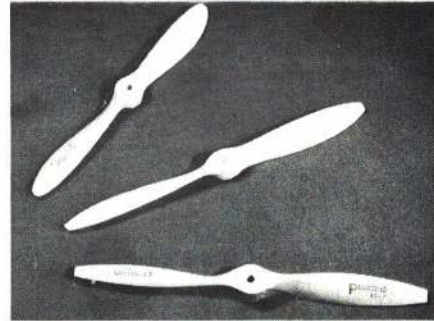
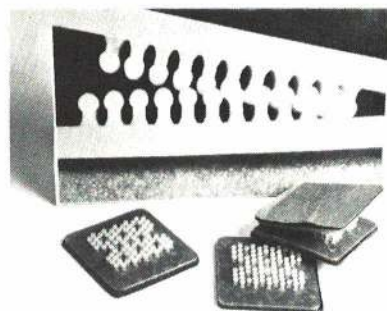
Sentinel Books/Model Rocketry Manual. By G. Harry Stine, this basic volume answers virtually all questions about model rocketry. 96 pages, 47 illustrations. It covers launching, construction, flying, engine theory, etc. For the novice or advanced rocketeer. \$1.50. Sentinel Books, Inc., publishers, 17-21 E. 22nd St., New York, N. Y. 10010

America's Hobby Center/Winston Mini-book. A summary of all phases of jet-powered model aviation from 1946 Dyna-Jet to present. Plans for aircraft, 'copters, rockets, etc. Book A-10. America's Hobby Center, Inc., 146 W. 22nd St., New York, N. Y. 10011



Italaerei/RE 2000. Another in the fascinating series of Italian fighter aircraft of the WW II era. 1/72 scale Reggiane Falco I comes with display stand, variety of squadron insignia. Italaerei Model Import Co., Box 5607, Las Vegas, Nev. 89102

McKenna Industries/Three new fiberglass bodies. 20" one-piece tough fiberglass race car bodies available in STP McNamara, Indy Style, and Ford GT 40 configurations. Price, \$19.95 each. McKenna Industries, Hobby Division, 4838 Leafdale, Royal Oak, Mich. 48073



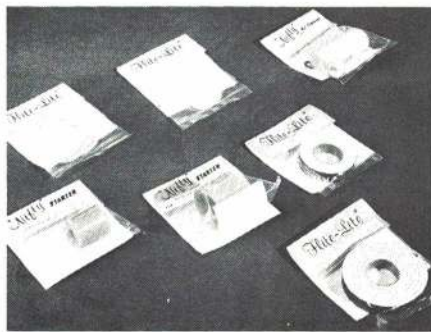
Taran Products/Reusable fastener. Interlocking plastic teeth hold two halves of adhesive-backed fastener firmly together, but allow separation without breaking basic adhesive bond. Strong grip for mounting servos, receivers, etc., which may have to be removed. \$1 per pair. Taran Products, 466 Giannini Dr., Santa Clara, Calif. 95051

F & D Hobby Supplies/Three new props. Now available are: Bartels fiberglass props (center) in a variety of pitches, from 7" to 11", finished and unfinished, to \$3. Also, Punctilio wood props, from England, in maple and beech, up to 18" with many available pitches. To \$1.50. Additional data, write F & D Hobby Supplies, 43 Gaybower Rd., Monroe, Conn. 06468

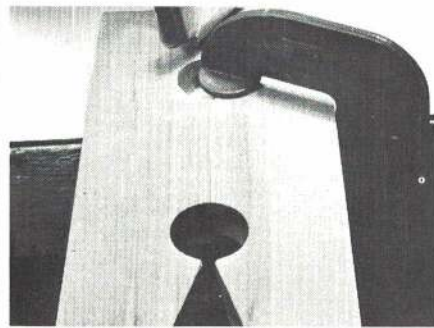


Trans-Start/Automatic engine starter. Spring-loaded, crank mounted behind prop, can be initiated by servo pulse for smart, non-assisted starting. \$22.95. Ramco Hobby Products, 16 Broad St., Randolph, Mass. 02368

Tatone Products/RC pylon engine mount. Beautifully finished aluminum alloy custom engine mount with matching rear nut plate is designed especially for 40 engines in RC pylon racing applications. Rear plate minimizes vibration; aluminum construction provides excellent heat dissipation. Heat-treated for extra strength. Can be ordered with drilling to your specs. \$4.95. Tatone Products, 4719 Mission St., San Francisco, Calif. 94112



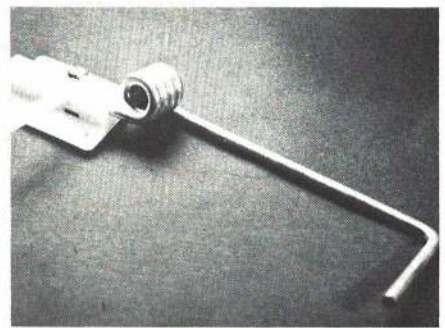
Sonic-Tronics/New line, flight accessories. Flite-lite and Nifty accessories packaged on display cards cover wide range of applications. Air filters, fuel tubing, servo mounting tape, other products. For full description and prices, write Sonic-Tronics, 8042 Craig St., Philadelphia, Penna. 19136



Broz Engineering/Jigform. To facilitate fabrication of small wood and metal parts, Jigform provides support and serves as guide for accurate shaping. Hardwood. \$1.98. Broz Engineering Co., Box 207, Scranton, Penna. 18501



Williams Bros./Deluxe thrust buttons. Using square mounting block, radial or in-line style buttons allow better alignment and shimming than round button. 3/8", 1/2", and 3/4" size, to \$.89 per pair. Williams Bros., 181 B St., San Marcos, Calif. 92069.

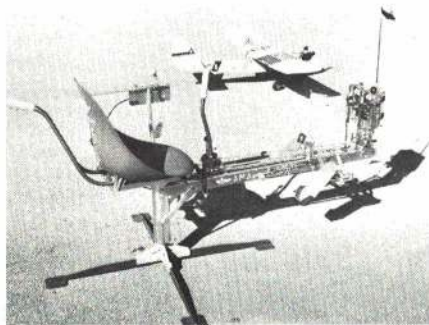


Carl Goldberg Models/Steerable nose gear. 6" nose gear features adjustable steering arm with special hardened steel collar and screw to provide non-slip steering control. \$3.45. Carl Goldberg Models, Inc., 2541 W. Cermak Rd., Chicago, Ill. 60608

new products check list

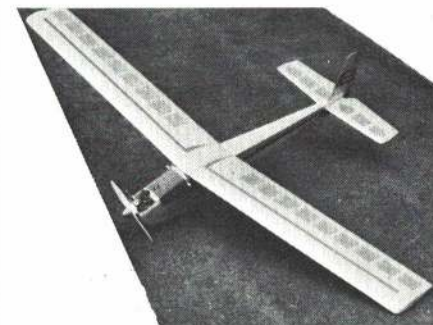
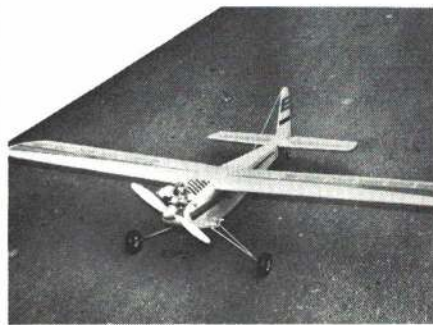


Dynamic Models/New RC car accessories. 1/8-scale radius rods for use with Dynamic four-wheel suspended chassis kits. \$4.95. Also, four-way exhaust manifold for 1/8-scale use. \$3.95. Dynamic Models, 13309 Saticoy St., North Hollywood, Calif. 91605

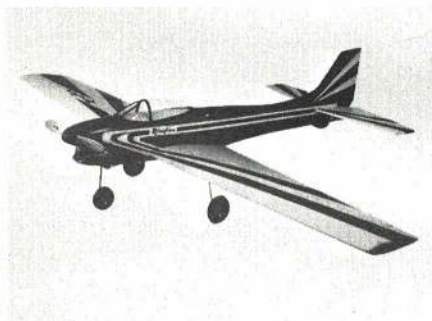


Ed Henry Fly Seat/Plans. Consists of plans for full-scale rotatable bucket seat and standard aircraft controls, integrated to the input of full proportional transmitter. Quickly disassembles for transport. 16 sheets, 11 x 15" plans for \$6.75. Ed Henry Fly Seat, 9154 Severin Dr., St. Louis, Mo. 63134

Patchogue Hobby Center/Jet-Start adapters. Now Jet-Start can be used on non-spinner props and for flywheels. Two new adapters can be easily interchanged with existing drive unit as required. \$4.95 ea. Patchogue Hobby Center, 240 Medford Ave., Patchogue, N.Y. 11772

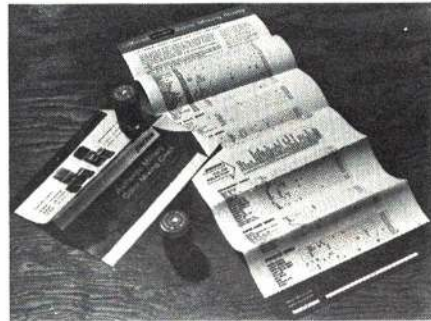
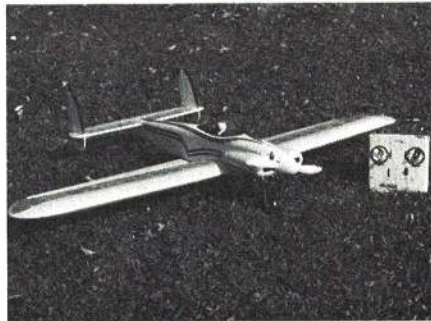


Rand Sales Co./Two new RC hi-wings. Specifically designed for full-house digital proportional flying, Little Hawk is economical, easy to transport, flies on only 15 to 19 engine. 46" span, \$14.85. Also Sky Kangaroo, powered glider with 57" span, 09-powered, \$14.85. Rand Sales Co., Box 20059, Columbus, Ohio 43220



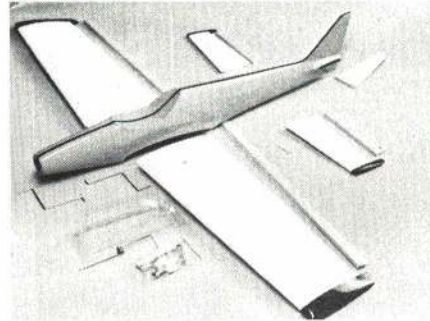
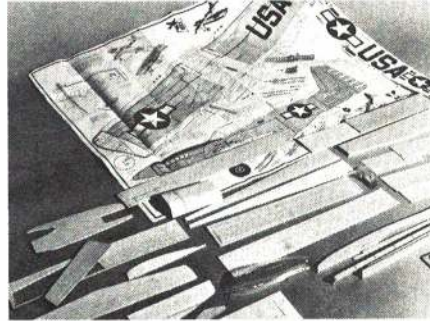
Scientific Models, Inc./Sport Fisherman. 27" length, 8 1/2" beam, kit includes all necessary marine hardware, nylon propeller, rail stanchions, other items normally extra cost. Die-cut bulkheads and keel, plastic windshield. Power by electric or 1/2A, free-running or RC. \$26.95. Scientific Models, Inc., 113 Monroe St., Newark, N.J. 07105

Sterling Models/New RC Rimfire. 56" span for full-house operation with 29 to 45 engine. Kit shows well-thought-out assembly techniques for fast, easy building. Full-length fuselage sides, hollowed fuselage top, steerable nose wheel. All fittings, decals, etc. \$27.95. Sterling Models, Belfield Ave. and Wister St., Philadelphia, Pa. 19144



Joy/RC Mars. Features unusual, fully operational twin tail and unitized main gear for exceptional strength. Cast aluminum motor mount, vacuum-formed cowl and canopy. Critical parts pre-sawed. Elliptical wings for stability. 52" span, power 29 to 49. \$39.95. Joy Products Co., Box 173, Menominee, Mich., 49858

Pactra Industries, Inc./Free color data. For the serious scale modeler, chart provides data on mixing more than 100 camouflage and solid military colors. All colors matched against existing MIL-specs. Data from 12 nations. Write Pactra Industries, Inc., 6725 Sunset Blvd., Los Angeles, Calif., 90028



Midwest Products/Profile P-51. For slow combat, stunt, or sport flying, UC Mustang has span of 48", uses 29 to 40 power. Kit complete including decals and detailed plans. \$10.95. Midwest Products Co., 400 S. Indiana St., Hobart, Ind. 46342

Reddi-Flite Products/Dragon FII. Beautiful pre-finished fuselage, wings, stab, ready for trim and AMA numbers. Most of the work already done. 60" span, 60-powered. \$79.95. Reddi-Flite Products, Box 608, Lansdale, Penna. 19446

SANTANA

Serious competition
Nordic A-1 designed for long life
and trouble-free flying

by JON DAVIS

THE SANTANA EVOLVED originally from a Syncopator-design A-1 glider, which seemed to tow easily and yet still outglide the standard square-wing A-1. By changing a few dimensions and airfoils and by completely revamping the construction, I felt that a better all-around flying model could be achieved. The wing and stab airfoils are the same ones used on Maxine, an outstanding Wakefield designed by Jim Taylor.

Flying the smaller and more versatile A-1 is both fun and a rewarding experience. It also is good preparation for flying any A-2 glider. An A-1 is easier to build and, if it is lost or broken because of inexperience, the loss is not as great as with an A-2 glider.

The original Santana used a Tatone timer for a dethermalizer, but a lighter model can be built by using a fuse in its place. A new fiberglass boom from F.A.I. Model Supply is used to make a stronger and lighter fuselage.

Santana is meant for modelers with some towline-glider building experience. It must be built exactly as shown on the plans.

Construction

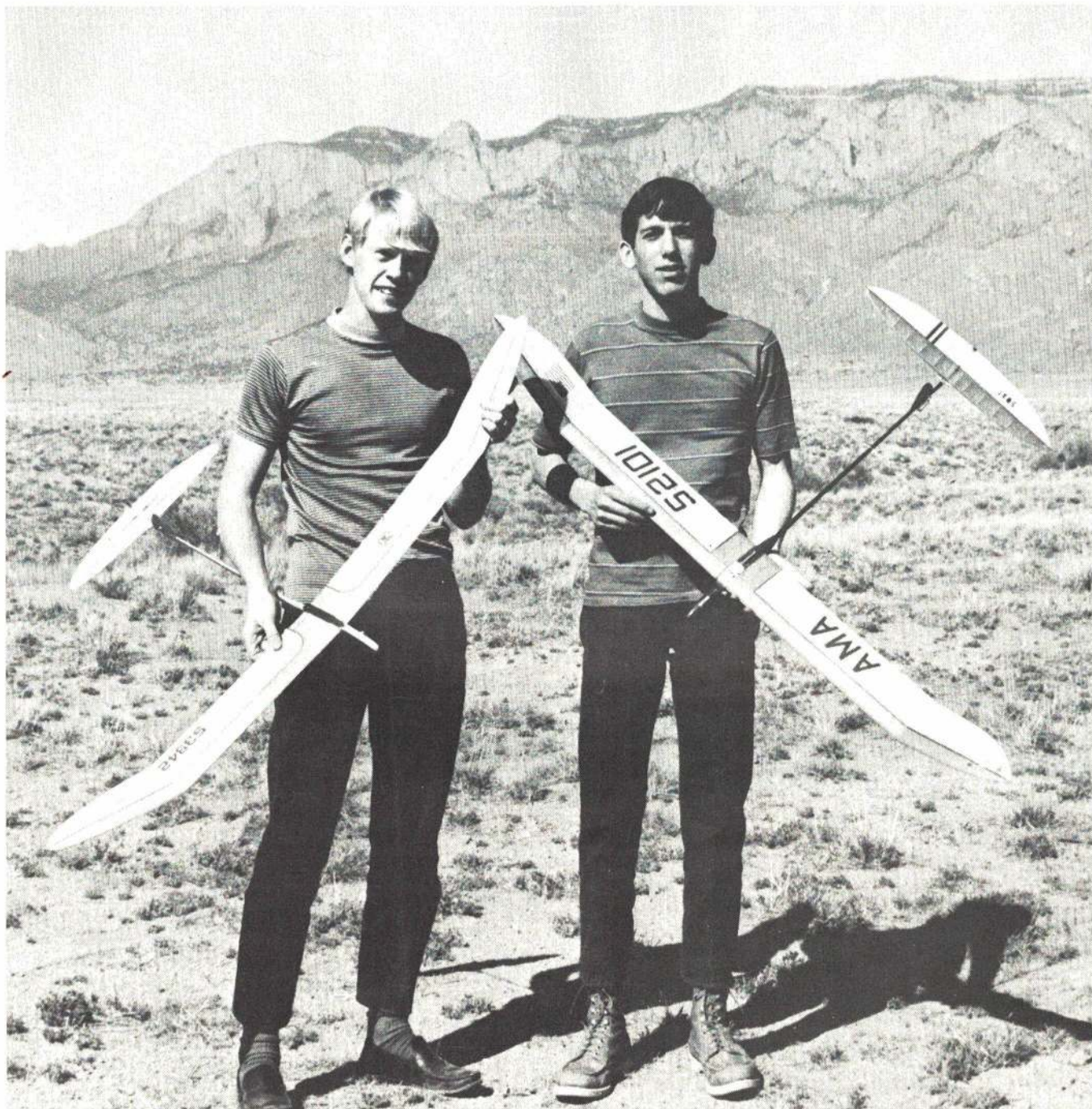
Wing: Start by making a 1/32" sheet aluminum rib template, then cut out 22 W-1 1/16" balsa wing ribs and 6 W-0 wing ribs from 1/16" ply. Drill holes in W-0 ribs (see plans). Also cut out all wing tip ribs.

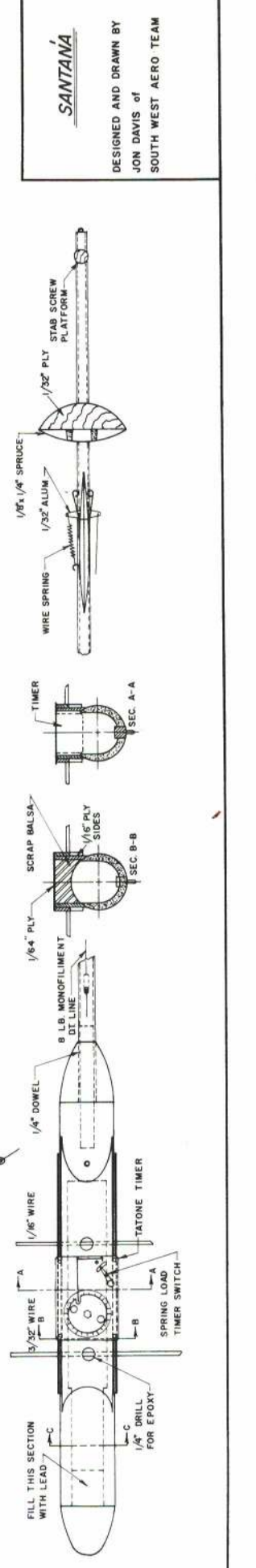
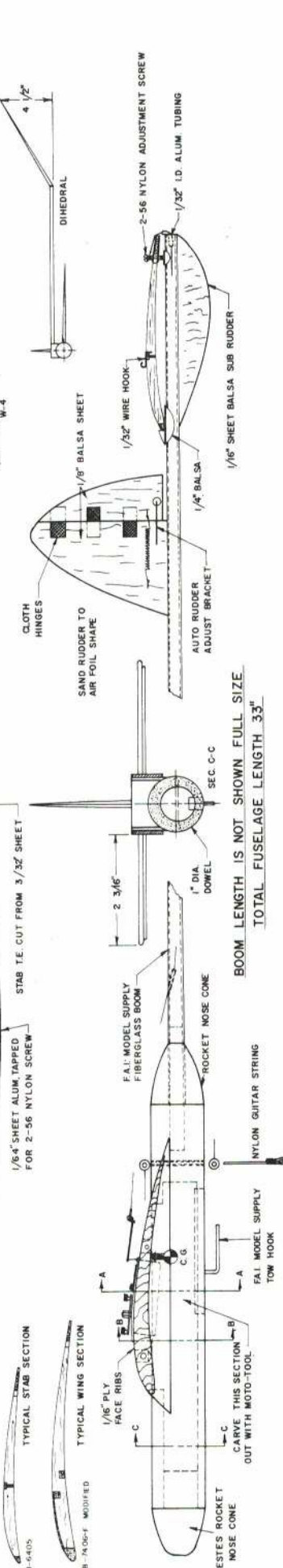
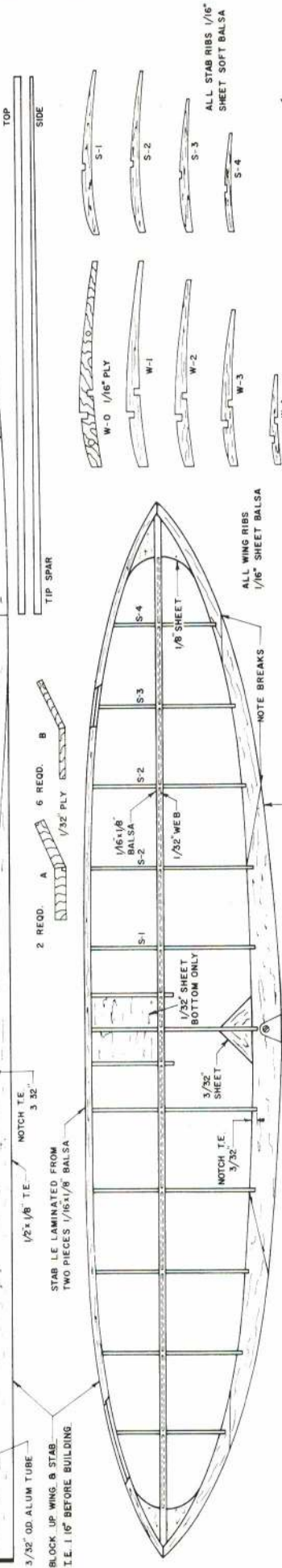
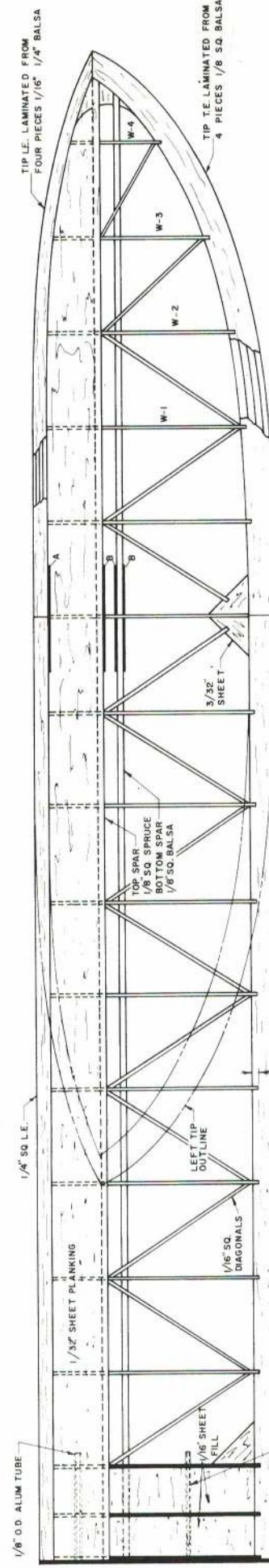
Laminate both tip leading and trailing edges from soft balsa, which is soaked in water for 15 minutes, then glued over wax paper with Titebond glue.

Cut all the notches in the TE to accommodate the ribs. Tack leading and trailing edges to the plans and block up the front of the trailing edge 1/16", tapering to nothing at the tip.

Pre-glue all wood joints with Pactra glue. Glue in all wing ribs, including plywood W-0

(Continued on page 76)





SANTANA
 DESIGNED AND DRAWN BY
 JON DAVIS of
 SOUTH WEST AERO TEAM

BOOM LENGTH IS NOT SHOWN FULL SIZE
 TOTAL FUSELAGE LENGTH 33"

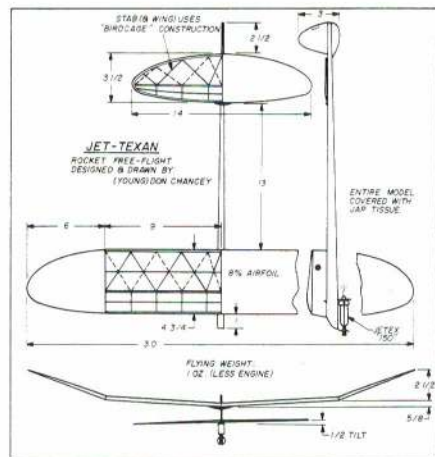
WHERE THE ACTION IS

FREE FLIGHT

SPORT

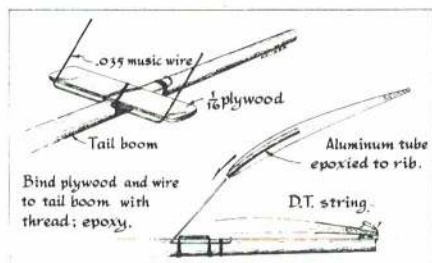
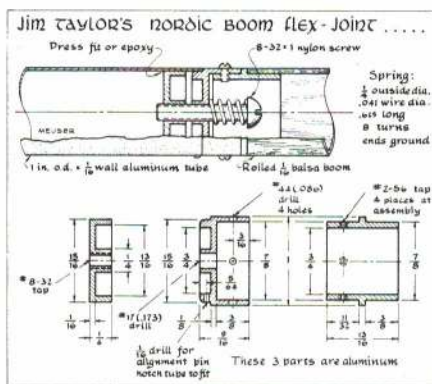
Nats-Winning Rocket: "Young Don" Chancey's JET-TEXan won the Open FF Rocket Power event at the 1970 Nats with a cool 33-sec. lead. This model is the fourth in a series—earlier rectangular-planform models were used to optimize the pylon height, tail moment arm, and tail areas. A generous amount of dihedral, and rudder placement behind the stab and out of the jet blast, have resulted in a consistent power-on flight pattern.

Light weight is the key to success in rocketry, but if the wings are flexible, and if the nose ever gets below the horizon, it is all over. Rocket thrust does not decrease as speed increases, as it does with a gas model. Light weight, structural rigidity, and warp resistance are achieved in the wing and stab by "birdcage" construction, typical of all of Dick "Fast Richard" Mathis's gas-powered models of the past few years.



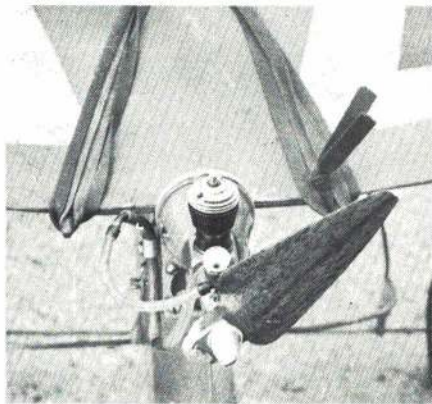
The Jetex has two main problems: lighting the fuel and sealing the case. Assuming the fuse itself is okay, the ignition problem is mainly one of getting good contact between the fuse and the fuel pellet. Don passes the fuse through a hole drilled into the rearmost pellet, then wraps it around a groove cut into the middle pellet. As the fuel burns from the center toward both ends, the burn is short but powerful. Dick Lyons achieves good fuse-to-fuel contact by gluing the spiraled end of the fuse to a thin wafer cut from a fuel pellet, using model cement.

Essential to solving the seal problem is a



thorough cleaning of the metal surfaces that contact the gasket. A new gasket must be used for each flight and can be cut from bonded-asbestos gasket material. Preferably, they are a little thicker than the standard gaskets, but a lathe or special punch-and-die set is required.

Stabilizer Mount: From Whakatane, New Zealand, comes Donald Hague's alternative to the usual rubberband method. It is simple, reliable, and aerodynamically clean. The tubes epoxied to the ribs are curved to give a friction fit with the wires, and the wires are angled inward. Thoroughly field-tested on A/1 and A/2 towline gliders, it would probably work well on other classes also. Stab pops up in the usual fashion for DT.



To push lots of weight and drag, Don Monson designed this wide-blade propeller.

Flex-Joint: Several schools of thought influence Nordic tailbooms. Those who say, "Make it strong enough to stand a minor crash," have a rather heavy model, which tends to plough through turbulent air rather than riding the bumps. Others say, "Make it light," and hope its durability is never tested, because it hasn't much. Others favor using fiberglass fishing-rod blanks, but they are not especially light, and their flexibility is detrimental to towing and rough air performance.

The Albuquerque-Detroit school favors a light balsa tube tailboom, with a flexible joint

to protect the boom if a wing tip snags a fencepost or power-line on the downwind leg of the turn. Under the loads normally encountered in towing and flying, the joint remains rigid. But, like a safety ski binding, the spring force must be properly adjusted—loose enough so the joint will flex before the boom breaks, tight enough to prevent the joint from flexing when it isn't supposed to.

The joint shown is the latest design by Albuquerque's Jim Taylor, member of the 1969 U.S. Nordic Team and the 1971 U.S. Power Team. Ten have been built by South West Aero Team (SWAT) members, and no problems have been encountered. A larger version has been used on Wakefields successfully. The one-in. OD aluminum tube front section totally encloses the DT timer. The April 1971 AAM showed a nifty way to make a tapered tailboom form.

Cool Cargo: Don Monson flew his weird pusher biplane at the 1970 Nats. A former Cargo record-holder and a writer on Cargo and prop design, Don designed the special wide-root lefty prop according to Theodorsen's principles, but failed to beat two-in-a-row winner Lou Willis. Lou's winner was shown in the July 1970 AAM. It will be interesting to see what Don and Lou come up with for this challenging event at the 1971 Nats—both ceremoniously smashed up the old hardware as an incentive to build something new and different.

BOB MEUSER
GENERAL CORRESPONDENT

SCALE

New Products: Williams Brothers, long a supplier of plastic items such as pilots, machine guns, and detailed engines, have come up with several new items for scale modelers and free fliers. The first is a plastic propeller designed for the Brown Junior CO2 engine. For this application, the prop is made rather large so that it can be cut down to whatever size a little scale job requires. From the sample, it is apparent that this also will be an excellent propeller for small rubber-powered scale jobs. Peanut Scale modelers, rejoice. Price is 29 cents.



Hurring Hannan rushed slowly to rescue the CO2 seaplane. Text tells why.

The other item is a series of nose plugs, similar to the old-fashioned types in pre-WW II scale kits, but with one vast improvement. The plugs are designed to fit in square holes, and the square is large enough for a sizable rubber motor to go through for winding without a struggle. Others beside scale modelers will like these nose plugs. I used one of the larger ones on my latest Coupe D'Hiver. It worked beautifully and saved all that noseblock construction time.

Bill Hannan's 1971 catalog, "Plans and Things," is out and has lots of great little goodies.



Noel Schurig builds all kinds of fine FF scale. Young but expert craftsman.

Hal W. Swanson (Modernistic Models, 4322 Bellingham Ave., Studio City, Calif. 91604) has a great series of rubber scale plans available for built-up models in the grand old tradition. They really are a good buy. Spans range from about 15 to 30 in. Most are around a 20-in span and built up out of formers and stringers in the standard fashion. Hal Swanson is a dedicated model designer with lots of drafting talent and a flair for selecting interesting airplanes.

A few of the many model drawings available are: Staggerwing Beech, Grumman Bearcat, Piper Cherokee, Armstrong Whitworth F.K.12 Triplane, Lockheed Altair, Curtiss F11-C2 Goshawk, Chester's Goon, and Folkerts' Toots.

Orbiter's Contest: The Orbiter's monthly Scale FF contest, Feb. 14, was well-attended despite rougher wind conditions than usual. We are all spoiled in San Diego. Overall winner was Kevin Pardoe, who recently left the Juniors to compete on an older level. He flew an Avro Ultralight designed by Bill Hannan. Doug Mooney won Peanut Scale with a Rearwin Speedster.

One rule of the Orbiter's monthly contests is that winning planes are handicapped on subsequent contests. At the last contest, almost all the entries had at least one handicap point against them.

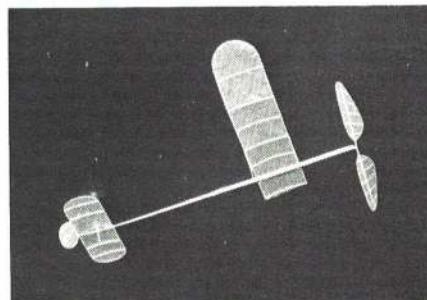
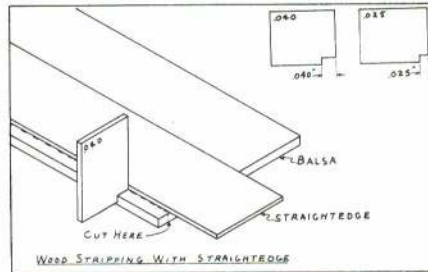
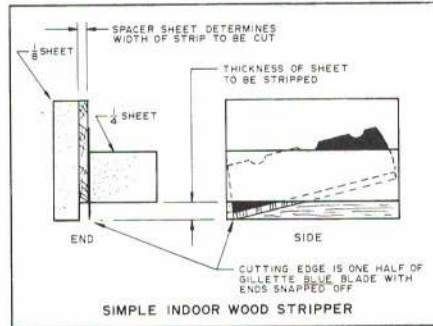
Scale Waves?: A summertime effort by Bill Hannan shows him hurrying to retrieve his CO₂-powered Train Monoplane which dunked itself at the last Flightmasters Seaplane Scale meet. The dunking wasn't too surprising, considering Lake Elsinore ripples were about scale for four-ft. waves! Bill was forced to hurry slowly to keep from creating scale tidal waves capable of destroying the model. He went on to win the event.

**WALT MOONEY
SPECIALIST CORRESPONDENT**

INDOOR

Wood Stripper: Tom Vallee's interesting series on indoor models (Jan., Feb., March 1971 AAM), has sparked the question of how to cut small spars with a constant width. Tom's wood stripper (see sketch) is the answer. Assemble several, making the spacer sheets in various thicknesses such as .20", .025", .030" and .040". This set will do as a starter; add others as needed.

Use Straightedge: Extra-light indoor models (and even some outdoor models) use tapered spars to put extra strength where it is needed. For example, spars are deeper near the center of the wing where stresses are greater (or lighter near the tip). Either way, the problem is to make both front and rear spars alike so the wing will be structurally balanced. Gauges to position the straightedge simplify this job.



Richmond's record-holding Paper Stick model.

Place the straightedge in approximately the right place on the sheet of wood, then use the gauges to position the straightedge exactly (see sketch). Check both ends of the straightedge several times to make sure one end hasn't moved while the other end was being set.

Holding the straightedge firmly in place, cut the spar by making several light, smooth cuts with a sharp knife. Don't make the cut with one mighty slash, because any slip or hard spot in the wood can cause a jagged edge or move the straightedge.

Wing Socket Mounting: In the March 1971 AAM, we told how to make wing sockets for indoor models. Here's how to mount them. After trimming the sockets to length, glue a short plug of balsa in one end and sharpen it. Mark the position of one socket on top of the motor stick and push a straight pin straight through the stick, leaving a small hole in top and bottom of the stick. Use a succession of small, sharp drills to "worry out" the top hole to fit the socket, then slide the socket into the hole.

Force the point of the socket through the bottom hole, and check to see that the socket is properly aligned. (Sight along the stick from the front and from the side. A two-in. piece of wing post stock placed in the socket will aid in spotting mis-alignment). After the alignment is correct, glue the socket in place.

Install the other socket the same way, except that its alignment is checked with the first socket. After all glue is completely dry, trim the points of the sockets flush with the bottom of the motor stick and rub thin glue over the joint.

More Indoor Flying: The Long Island Association of Model Airplane Clubs will hold its first semi-annual indoor meet at the Cantiague Park Skating Rink, May 2, 1971. Contact J. G. Pallet, 30 Emerson Rd.,



Run slowly here too—it is ice. Bob Clemens shows indoor activity at N.Y. rink.

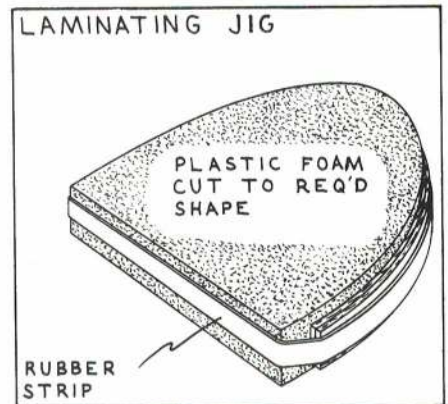
Brookville, L.I., N.Y. 11545, for more details. Indoor sessions will be held through June 1971, in Hauppauge, N.Y. Contact Bob Sylvia, 28 Holiday Park Dr., Hauppauge, N.Y. 11787, for time and place.

**BUD TENNY
SPECIALIST CORRESPONDENT**

GLIDER AND RUBBER

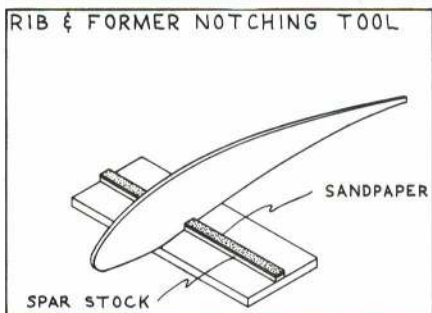
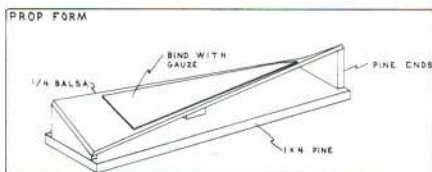
Ingenuity and Necessity: With the varied skills needed for today's model construction, ingenuity is at a premium. Yet the builder with only the most basic equipment often turns out the most beautiful ships! With "Necessity is the mother of invention" as a motto, several modelers have created the following new techniques.

Brian Fairey figures that plastic foam is a better medium for forming laminated balsa parts than the usual "100 pins into the plan" technique (so do I). Don Scott builds a series of sandpapered spar notchers for different sizes of spars. Accurate depth and width are guaranteed.



Brian Fairey builds two-bladed laminated rubber model props by using a helical form and laminating balsa sheet blanks over it. Slightly wet the sheets and laminate, using a water-base glue (Elmers or Wilhold) and bind to the form.

You may have other tricks you've been using for years—why not share them? For example: A-2 glider filers use fiberglass fishing rod blanks for fuselage booms. They're strong, inexpensive and relatively light. However, the very small end of the rod is usually too flimsy and flexible for A-2, so it ends up as a paint stirrer or excess baggage. Meanwhile, hand launch glider filers have been breaking their balsa or spruce fuselages for decades. Ergo, someone put two and two together and uses the small fiberglass boom end for hand launch glider, creating an unbreakable boom.



Above: Tail-less towliners with swept wing offer excellent performance in calm winds.

Free flihters are traditionally conservative and hidebound and won't build from kits as is—if they build from a kit at all! Few will build directly off the plan without a modification or two. We look down our noses at the poor ARF RC type who plugs his rig together one day and files the next. Is any free flihter envious? Maybe. Why not an ARF for free flight—at least for those who fly hand launch glider?

John Crosetto has a prototype ARF (actually RTF) hand launch glider made principally from styrofoam. This probably will be hitting the market just about now. Don't think that it's just another toy! This elliptical-winged and dihedralled model has nearly 50 sq. in. in the wing and, when my Hedgehoppers were getting only about 35 sec., I was able to get nearly 25 sec. with the styro-glider.

BOB STALICK
SPECIALIST CORRESPONDENT

CHUCK BROADHURST suffered a fatal heart attack during the early morning of March 1, a few hours after his return from the AMA Executive Council meeting in Toledo.

While Chuck was an active competitor, and had collected his share of trophies, it was in the areas of organization, management, leadership, and the communication of ideas that his skill and vigor made their greatest impact. Indeed, it was in these areas, although



Chuck Broadhurst, a champion of free flight. A job needed doing? He was there to do it.

they entailed the most demanding kind of work, that Chuck derived great pleasure and satisfaction. He was heard to say that the last few years had been the most fun of any in his life. For such jobs, he was well served by his many years of experience as a radio and newspaper reporter, as Director of Publications for the County Supervisors' Association of California, and most recently as Assistant General Manager of that organization.

In recent years, he served two terms as President of the Northern California Free Flight Council, comprising the major clubs of that region, and was at the time of his death AMA Vice President for District X and Executive Director of the National Free Flight Society. He organized the series of annual contests which culminated this year in the U.S. Free Flight Championships on Memorial Day.

A mere catalog of his accomplishments, such as this, can only give a hazy out-of-focus picture of Chuck Broadhurst. Most of all, when a job needed doing, Chuck was there to do it.

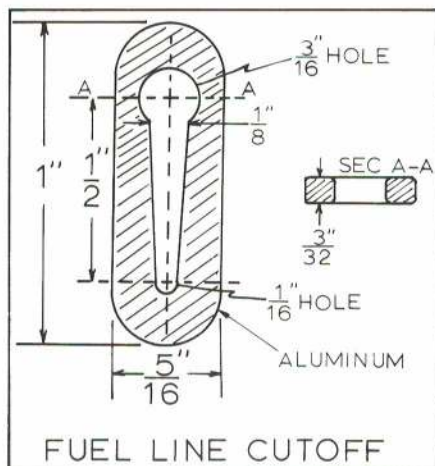
Model aviation has lost a great leader. Those who were privileged to have been associated with him have lost a great friend.
Bob Meuser



Don't miss the Boeing Management Assoc. meet, June 19 and 20, Seattle, Washington.

contestant who accumulates the highest score, based on his four best scores.

Sounds like a great weekend of competition flying for the younger set. For further details about the contest rules and events, write the Boeing Management Association, P.O. Box 3999, Seattle, Wash. 98142, Attention: Mr. Herman Clegg, Organization 1-1835, Mail Stop 85-48.



FUEL LINE CUTOFF

Fuel-Cutoff Device: A fuel-cutoff device for pacifier-type fuel systems is easy to make from a small piece of aluminum. The device eliminates closing down the needle valve to the shutoff position each time the tank is filled. Therefore, needle valve settings remain in the running position, which is especially valuable for combat ships where fast refueling is required. The device does away with the need for pliers, clothespins, surgical clamps, etc., to hold pacifier pressure after it has been filled with fuel.

Construction is easy. Lay out the unit on 3/16" thick aluminum, drill 1/16" and 3/16" holes, and cut in the slanted slot with a jeweler's saw. Cut around the unit outline, then round off all edges with a small file to prevent cutting the tubing. To use the cutoff, simply slip the tubing through the larger end of the slot before connecting the tubing toward the small end of the slot. The tubing slides easily when lubricated with a few drops of fuel. This idea comes from Miguel Salvador.

Stooge: The dictionary describes a stooge as one that is placed in an audience to heckle an actor on stage. However, to the modeler it is something quite different! This device holds a model plane in place, with its engine running, thus permitting the plane to be launched from the center of the circle. Launching usually is accomplished by pulling a long string, which in turn trips the device, releasing the plane.

Several stooge ideas have been sent in recently. Some simple ones feature several screw eyes and a piece of wood; other, more

CONTROL LINE

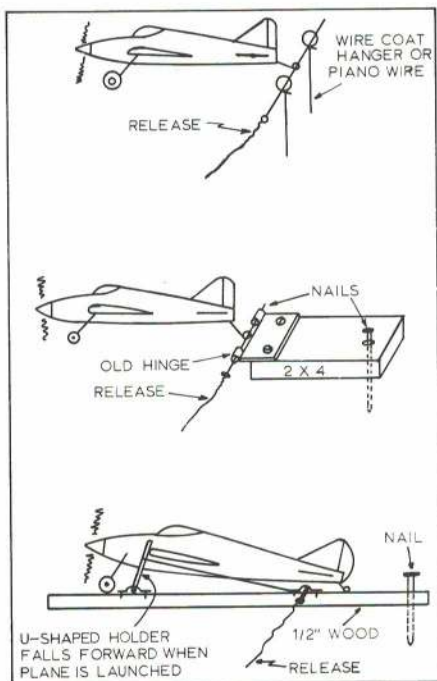
SPORT AND SCALE

Scholarship Award: The Boeing Management Association again will host the BMA Model Airplane Scholarship Contest, June 19 and 20, 1971, at the Boeing-Kent Space Center, south of Seattle, Wash. Anyone less than 19 years of age as of July 1, 1971 may enter. However, membership in the Academy of Model Aeronautics, The National Association of Rocketry and/or the Model Aeronautics Association of Canada and a \$1.00 per event entry fee will be required.

Grand prize of the contest is a \$1500 scholarship to any accredited college in the U.S. Its purpose is to reward excellence in designing, building, and flying model airplanes and rockets.

Competition will be in three basic categories: Free Flight, Control Line and Specialty. The Specialty category includes Indoor Flying, Rocketry, and Radio Control events. In addition, those models which have been flown and which have scored in a flying event will be judged for Design Craftsmanship, based on quality of finish, innovation, execution, accuracy, fit, etc.

All events are to be flown in accordance with AMA and/or NAR competition rules. In addition to the scholarship award, trophies will be presented to the best Junior (AMA Classification) and the first three winners in each event. The scholarship award goes to the



sophisticated ones are cradle-like affairs to hold the model until it is released. Several methods are used to hold the stogie in place. Field boxes or some heavy objects are placed on one end of the stogie in some cases; in others, a long spike or piece of heavy wire is pushed through a hole in the stogie and into the ground.

The simplest idea, and perhaps the cheapest to make, appeared in the Aero Angels (Chicago) Newsletter. This stogie was made by cutting a wire clothes hanger into three equal lengths and bending closed loops on one end of each piece. Two of the rods are pushed into the ground and the third placed through the two loops and looped tail skid of the model (see sketch). This isn't a case of "Can you build a better mouse trap?" For the modeler, it's "Can you build a better Stogie?"

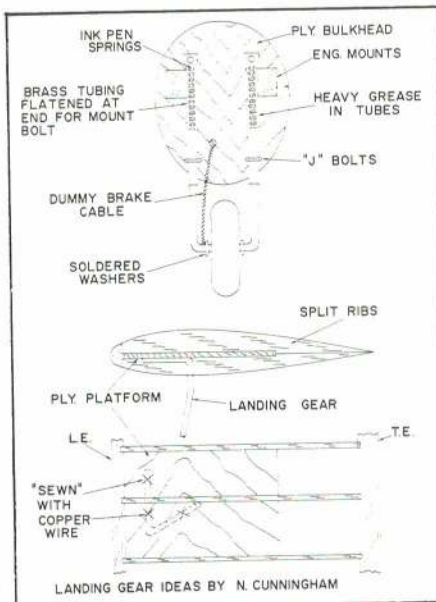
Measuring Jars: Need a graduated container for mixing dopes for spraying or for mixing that odd color? Grab an empty Skippy Peanut Butter jar! Marked in 1/4 and 1/3 cup graduations, these jars provide a convenient means for consistently mixing a particular shade or color. Once the desired color has been obtained, record for future use the quantities of dope mixed. This type of record is particularly useful to the scale modeler who may have to reproduce odd camouflage colors. In addition, the rubber seal on the jar cap allows the mixed dope to be stored for some time. Dennis Ratliff submitted this handy suggestion.

**BILL BOSS
GENERAL CORRESPONDENT**

CARRIER AND STUNT

Noise Psychology: The Newsletter of the San Jose (Calif.) Aero Modelers, edited by John Donaldson, comments, "Contest flying is nice, but one can't help noticing a bit of inbreeding. Air shows, on the other hand, get us out of ourselves and present our hobby to the public. Every new modeler is another person who never will phone in a noise complaint."

Old-Timers Galore: Since 1963, Fran Ptaszkiewicz (23 Marlee Drive, Tonawanda, N.Y. 14150) has had plan reproductions of many old-time deBolt models. Because of renewed modeler interest, he again is making

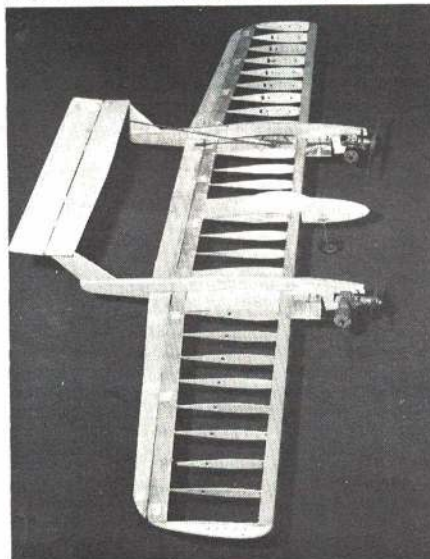


available the following: Bipe, New Bipe, Super Bipe, Continental, Stuntwagon, Stuntwagon 30, All-American Senior, Super Wildcat FM-1, All-American Stunt, All-American Trainer, and Speedwagon 29B. He also has some kits on the Continental, Speedwagon 20, Combateers and Sportwing.

Shock-Mounted Landing Gear: The trend toward realism in Stunt models dictates many features not otherwise needed. Shock-absorbing landing gear adds realism to landings and removes the rigid-gear bouncing effect, which decreases scores.

Norval Cunningham presents a practical approach to a shock-absorbing nose gear assembly. Tubing size is best determined by the builder on the basis of strength desired, but 1/8" dia. or larger is recommended. The smaller diameter tubing should have a sliding, but adequate, fit inside the larger tubing. Lengths will be dictated by the model and by required prop clearance. The upper tubing, in which mounting bolt holes are drilled, is flattened. The lower pieces have music wire soldered between them to create the axle. The wheel is easily mounted in this manner. The springs are installed in the upper

Twin-19 stunter by Michael Fisch uses full length flaps and trike gear. Stunts fine.



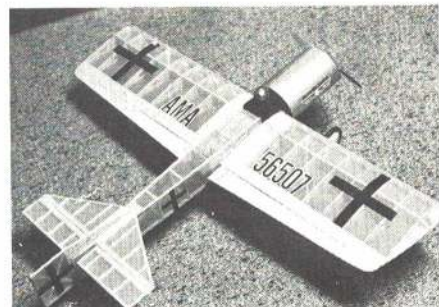
tubing, with heavy grease to act as a sealer, and then the lower unit is installed. The entire assembly is held to the firewall with two mounting bolts and two J bolts. A retaining cable, giving the appearance of a brake cable, is added by bolting to the firewall and soldering to the axle.

The platform-mounted wing gear relies on wire tension for shock absorption. Norval has mounted this assembly on a modified Smoothie he calls a Sky Stinger. It also features working lights!

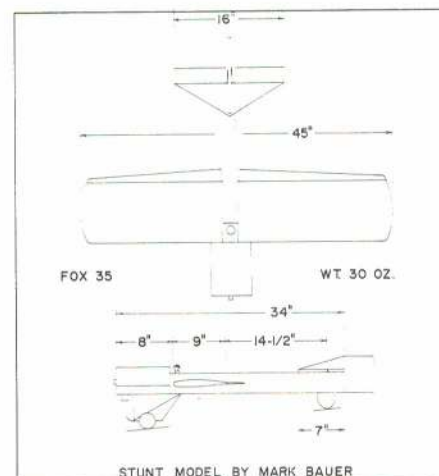
Do It With Two Engines: The noise of two engines is an intriguing sound. Michael Fisch, 14, presents a two-engine stunter of his own design. With its tricycle gear and unique appearance, it is a great interest builder in flying demonstrations.

Made from two Ringmasters or related profile kits and some additional balsa, Michael's model has conventional control, but the addition of throttle would enhance its demonstration abilities.

New Old-Time Stunt: For a new twist in unique stunt models, 13-year-old Mark Bauer presents his design, which is built around a Magician wing. The fuselage and tail surfaces are scratch-built and then covered with MonoKote. Even with a 45" span, Mark's method of construction results in a very light



Tired of modern idiom stunters? Mark Bauer's design turns history backward.



30 oz. Such a model adds interest to flying demonstrations. Mark didn't say so, but perhaps the cowl is made from a section of some form of aluminum cookware. This popular method has many practical applications, since it avoids difficult metal working.

Add To The Interest: This column is as interesting as its contributions, so let's hear from Stunt and Navy Carrier modelers. Write to John Blum, 2417 Glen Pl., Granite City, Ill. 62040.

**JOHN BLUM
SPECIALIST CORRESPONDENT**

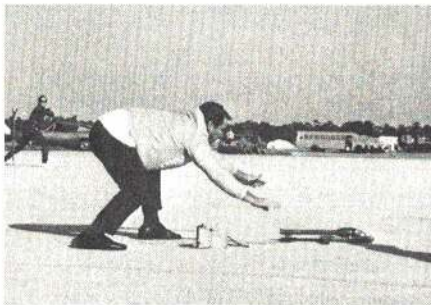
SPEED AND RACING

How About A NCLS? Johnnie Clemens, new AMA President, asked me to start the ball rolling to form a National Control Line Society, similar to the NFFS. Free fliers find the NFFS a great help to them with design symposiums, rules recommendations, FF newsletters, etc. Those interested in having such an organization should drop a post card to me at 960 Brenner Ave. N.W., Massillon, Ohio 44646. With enough response and enthusiasm, a meeting to get things under way could be held at this year's Nats.

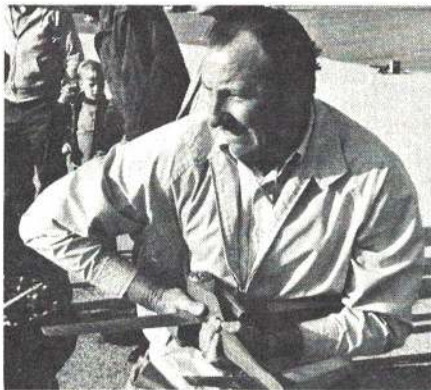
FAI, Cleveland 1971: Cleveland has been chosen officially as the site for the FAI CL Team selection, and preparations already are begun. The three-day meet, to be held over Labor Day weekend, will have press, radio, and TV coverage. Plans call for reduced rate motel accommodations, transportation to and from the flying site, test circles before official flying starts (eight of them), special awards for all finalists and trophies for the U.S. Team Members. Mark your calendar and come to Cleveland to compete or to root a favorite into the winners' circle!

Contributors, Now Hear This: If you have not been paid for your photos which have already been used in this column, please give me the magazine issue date and tell a little about the picture. We'll get that five-spot out to you pronto.

New Contestant Aids: I am putting together several items which should help contestants to get the word quickly during the heat of battle. The first is a rotating pylon which, by movable insert cards, will tell contestant placings in each event, down to tenth place. The second is a push-button-operated board which will flash the mph time in lighted numbers. It will be visible up to seventy-five ft. away and will include a warning light and horn to warn of rules infractions and three-minute time limits. The units will be used at the 1971 Nats. If reaction to them is good, drawings will be made available.



Above: Day and Andrews Speed team starts jet flight. Below: Bartley with pull test.



More On FAI Team Selection: Recently, I reported that fliers trying for points to qualify for final team selection (FAI CL) were required to pay the five-dollar FAI fee for each contest or trial. Not so, says Doc Jackson, this requirement has been dropped. The first time only the five dollars is paid for the FAI fee, the flier's license is stamped and from then on he's home free.

New Open B Record: Bill Wisniewski set a new Open B Record: 181.45 mph, back-up 180.00 mph. The engine was a new TWA 29 piped. Rumor has it that Bill is grooming son Rick for a place on the FAI Team. Rick already holds the Junior A record.

Rat Racers, Where Are You?: All kinds of information comes in on Speed, FAI, etc., but very little on the Ratters. Let's hear from you guys! Some of you are showing up in speed circles and are placing, so speak up.

JOHN SMITH
SPECIALIST CORRESPONDENT

RADIO CONTROL

SPORT AND PATTERN

Winter Reminiscence: As this column is being written (February), the action centers primarily in basements and workshops. No one in his right mind would venture out to fly with six inches of snow on the ground, wind blowing 15 to 20 knots and the temperature around 25 degrees—would he?

Well, the phone rang and it was Chuck Shade with words like, "Hey, Don, it's beautiful outside (the sun was shining), let's go fly. I've got a couple receivers that I want to get a cold weather check on." I had just



Frank Balletto is stuck on the Stik, shows his new low-wing Upside-down Stik.

finished an Ed Niles RC Combat Guillotine I wanted to check out for the Toledo bash, so I tossed everything into the car and off we went.

When it's cold, you prepare and fly in a hurry, so a few quick squirts of lighter fluid in the intake and five or six flips of the prop had the brand-new S.T. 19 roaring away. A quick check of the controls, a toss in the general direction of up, and the little bomb was airborne. A touch of up trim and it grooved along. Several flights later, interspersed with hand-warming sessions, I was convinced that the Guillotine, S.T. 19, Blue Max combo works just fine at 25 degrees—now, if the pilot worked only half as well!

Meanwhile, Chuck put in a couple of no-glitch flights on one receiver without a quiver, when suddenly it started to nibble now and then. A quick range check showed the range to be way down, and our immediate



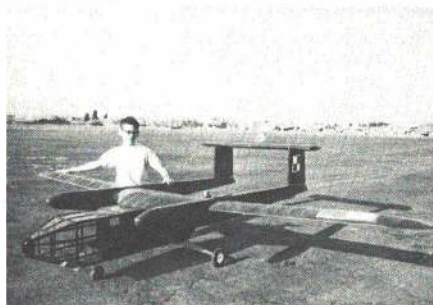
At Phan Rang AFB, Vietnam, plenty of international modeling takes place.

conclusion was that the receiver was temperature-sensitive. This is common when flying in cold temperatures, so it's wise to make a range check after the equipment has had a chance to stabilize.

Just to explore one more variable, Chuck decided to check the range with a warm 27.195 transmitter in the car. Result: the problem was a temperature-sensitive transmitter and not the receiver. This is unusual, but it can happen. So, in this kind of difficulty, don't blame the receiver and let it go at that. Check the complete rig.

Upside-Down Stik: Frank Balletto turned his talents to improving on the very fine Ugly Stik. He writes, "After learning to fly my Ugly Stik, I decided that it was time for a low wing plane. But as a beginner I wanted a plane as forgiving as the Stik and as easy to build. The answer—build the Ugly Stik upside down!" The result is a ship which "the beginner or pro can relax with and enjoy flying. The big wing lets the plane land so slowly it is hard to believe." It is also an attractive ship, judging by the color shots.

A fine builder, Frank sent some helpful notes on his Stik-conversion. With the fuselage flipped upside down, the wing saddle must be recut to take the contour of the top of the wing since it now sits on the bottom of the fuselage, at zero incidence. The kit's



The Groves/Snyder Polish Pidgeon has 11-ft. wing, one ST 71 and two TeeDee 049's.

fuselage bottom is made of 3/32" plywood front and 3/32" balsa rear. Using these pieces as guides, cut a new bottom from 1/4" balsa sheet. On the finished model, this becomes the top which can be rounded off and is thick enough for cutting a new tank hatch. The old hatch pieces are glued on and become the bottom of the tank compartment.

The fin and rudder can be used as is or reshaped as on Frank's model. The wing is built according to plans, with the addition of I.M. landing gear blocks epoxied to the rear of the bottom wing doubler between the W-2 rib and the second 1/8" rib. The ribs are beefed up with the plywood braces provided with the I.M. kit.

Frank reshaped the nose with scrap balsa and used a Tatone engine/nose gear mount to support a Max 60 Goldhead. The probable secret of this ship's successful transition to a higher performance design is the low wing

loading. Keeping the wing loading down makes any ship easier to handle, particularly when slowing down for landings.

Feedback: Cary Trestyn, who read of my problem in finding something suitable to mix epoxy on, responded by sending an envelope-size piece of polyethylene. Glue does not stick to the stuff and, when set, the residue can be popped loose by flexing the material. It leaves the original smooth surface. He says the stuff can be purchased for \$1.50 for a 5 x 3' piece. The 3 3/4 x 9" piece works just fine for all my five-minute epoxy making. Thanks, Cary.

Computer Magic: Computers for many are a mystical creation, to others they are a high-speed slide rule. Jim Lipschutz used his school computer to yield rib dimensions for tapered wings. It is a simple calculation, but the programming required is peculiar to the particular computer available. Several years ago we used a computer to plot the rib contours for an altitude airplane design. So see your local computer programmer for quick answers to laborious problems.

Handy Tool: Phil Gabler writes of the wonders of the Sears electric vibrator tool kit which sells for about twenty bucks. It comes complete with X-acto blades, saws, gouge, etc., and can be used to engrave, saw, chisel, gouge or carve. It can write your name on a transmitter, saw hardwood mounts, gouge and finish-sand wood blocks for wing fillets, etc. It sounds like something that no modeler can afford to be without.

DON LOWE
GENERAL CORRESPONDENT

GLIDERS AND FAI

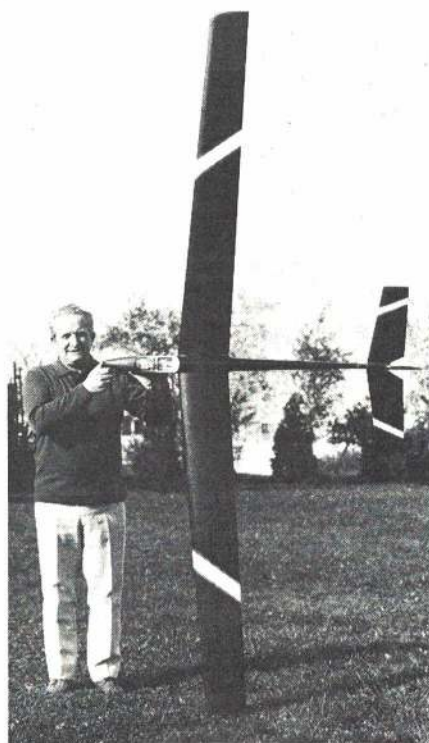
Nats Glider Meet?: At the successful informal glider meet held at the time of the 1970 Nats ("On the Scene," Feb. 1971 AAM), contestants expressed the hope that such an event would be repeated during the 1971 Nats, to be held at Glenview N.A.S. (July 26th-Aug. 1). RC gliding probably has been accepted as a provisional AMA competition event for 1972 (at this writing, the RC Contest Board's final vote was not known). Dave Burt says that SOAR has offered to run the meet, but location, rules and other matters are not final. However, it looks as though there will be a Nats RC Glider Meet.

Cirrus Successor: The great success of the Graupner Cirrus kit glider, both in competition and for sport flying, is undeniable. These sleek craft are seen flying everywhere. However, the Graupner concern has improved on the Cirrus, and the result is the new Cumulus.

The swept wing, a departure from the Cirrus, increases stability (not as much dihedral is required) and also moves the center of lift back a bit, so not so much nose weight is needed when light RC installations are used. The wingspan (110") is a little shorter than the Cirrus (118"), but the tip chord appears greater, so overall lift should be better. Wing root airfoil is similar to the Cirrus, but the tips are only about 8 1/2 percent thick.

Perhaps the most vital change is the new fuselage molded entirely of a special nylon formulation. Since nylon is difficult for the home builder to cement, the fuselage is supplied in finished form. It is assumed that arrangements have been made for the modeler to attach some parts, where vital. The bare fuselage appears to follow the Cirrus profile exactly, and the same style of molded canopy frame is utilized. The clear portion of the canopy is different.

This kit could be an ARF, since wings and tail surfaces all are of expanded foam, completely sheeted with 1.5 mm balsa at the factory. The balsa is not held on with contact cement (long exposure to sun weakens and



Fred Militky of the Graupner Company in Germany holds the new Cumulus ARF kit.

loosens such cement), but with an epoxy-like two-component glue, which stiffens and strengthens the wings.

Both stabilizer and rudder are fully pivoted, there is no fixed fin or stabilizer. The flying rudder should be a real help in attaining tight turns, since many large gliders are decidedly sluggish in turning. A kit for a power pod will be available, probably similar to that for the Cirrus and held on the same way, an attachment that has proven quite satisfactory.

Graupner's chief engineer says the Cumulus flies better than the Cirrus. Because of the thinner wing section toward the tips, the ship flies faster, but he emphasizes that it does have a wide speed range and handles beautifully at slow speed. Kit price and availability in the U.S. are not yet known, but it does seem that the Cumulus will be worth waiting for.

Where Are U.S. Kitters?: Why must U.S. modelers depend upon imported glider kits or spend time designing and debugging their own? The latter process may be real modeling, but many fliers won't take the time. Graupner and other German kits have been our mainstay, even though the U.S. has some of the best and most progressive model kit makers in the world. Some fine glider kits are made in the U.S. by small concerns but they are not widely distributed. Few of the larger kit makers appear interested in this field, although we hope to see more activity at the forthcoming RC shows.

Le Gray wonders, "Why in the world aren't manufacturers—as well as publishers—supporting sailplanes to even half the extent of RC cars? Can't commercial interests see the potential in gliders?" Le points out the amazing expansion of RC gliding in the San Francisco Bay area. His simple but attractive E Z Juan glider should be released by Midwest Products Co. soon.

Miskeet for Thermaling: The original Miskeet, designed by Harley Michaelis principally for slope soaring, was rugged throughout. Weighing close to 5 1/2 lb., the original plane

performed on a par with a Cirrus during recent slope tests.

Harley, who is now more interested in thermal flying, has a new Miskeet under construction, which should weigh no more than 4 1/2 lb. ready-to-fly. The wing spars are wood, with the usual D construction. Wings with fiberglass spars have no spar webs and are considerably more flexible than the all-wood wings. By omitting considerable fiberglass fuselage reinforcement, using less nose lead, dropping the nose wheel, and by other weight-saving measures, the lower weight can probably be reached for a wing loading of under 10 oz./sq. ft. (wing area is 7 sq. ft.). This should lead to fine thermal performance. Changes will be covered in the assembly hints which go with the semi-kit for the Miskeet, soon to be released by Fliteglass Models.

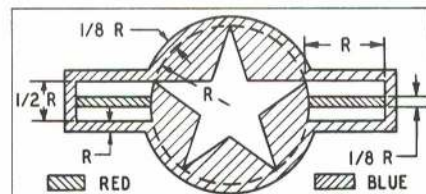
HOWARD McENTEE
SPECIALIST CORRESPONDENT

SCALE

Draw Your Own: When decals of the proper type or size are not available, it doesn't take a sign painter or artist to get good results on insignia and lettering. As an example, the official specifications for the USAF star and bar are illustrated.

Do a layout on paper first, checking the model plan with photos of the prototype for correct placement and proportions. Paint an oversize area white where the insignia will appear. Trace the outline onto the model with a soft pencil. Don't use a ballpoint pen—the ink will bleed through many layers of dope. Mask off the insignia area and spray the rest of the model. The edge between the two colors need not be exactly perfect.

Thin the blue and red dope slightly with anti-blush thinner to slow drying. Dip an ordinary mechanical-drawing ruling pen into the red paint and wipe the excess off the outside on a rag dampened with thinner. A line can be drawn just as though the pen were filled with ink, although it is sometimes a little more difficult to get the paint started at the beginning of a line. Mark on a finger first and immediately go to the model. Clean the pen between fillings by dipping in thinner.



Outline the red bar with a red dope line. At the ends, run over slightly into the area that will be blue. Fill in the red with a brush in the easy kid's-coloring-book technique—the line makes the edge sharp. Better yet, mask off, placing the tape edge in the middle of the line and spray. The line eliminates that fuzzy tape-edge look.

Duplicate the operation with the blue. For the circular blue edges a mechanical drawing compass pen is used just like the ruling pen. Scotch-tape a small piece of celluloid over the center to keep from punching a hole in the model's surface with the instrument point. The blue lines cover up the slightly irregular original separation between the white background and the color of the rest of the model, as well as the over-runs at the ends of the red bar.

The same techniques can be used for more complicated designs, always going from light to dark colors, outlining with a ruling pen and compass, using flexible rules and French curves. For lettering too small to conveniently manage, rub-on decals can be incorporated and made permanent with successive very light coats of sprayed clear. Results with this process are pleasing, permanent, fuel proof.

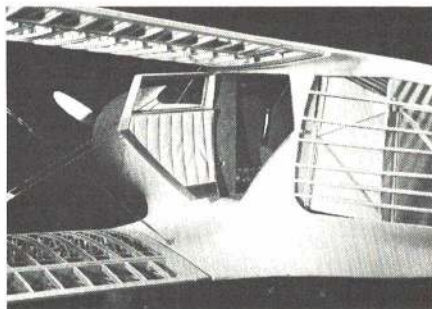
Backward, March!: Even though the Bremen and Cranfield World meets operated with an 11-lb. weight limit for RC scale, without fuel, the FAI has reverted to requiring fuel at weigh-in. Seemingly an example of rules for rules sake, thus protecting historical habits, in effect this specification makes it even more difficult to model complex types, driving sizes smaller and wing loadings higher. The 1972 U.S. Scale team selection at the 1971 Nats will have to use this new ruling.

Scale Data Sources: The Air Force Museum, Wright-Patterson Air Force Base, Ohio 45433, will lend tech orders and photos from their extensive collection for a 30-day period. Mainly limited to AF aircraft, the manuals contain much valuable information.

That Copy Problem: Modern, widely available photocopy machines give acceptable results with line drawings and print but generally render photos into blobs. The only way to get satisfactory results is to use a copy camera,



Magnificent Staggerwing Beechcraft by Ron Jones has scale retract gear system too.

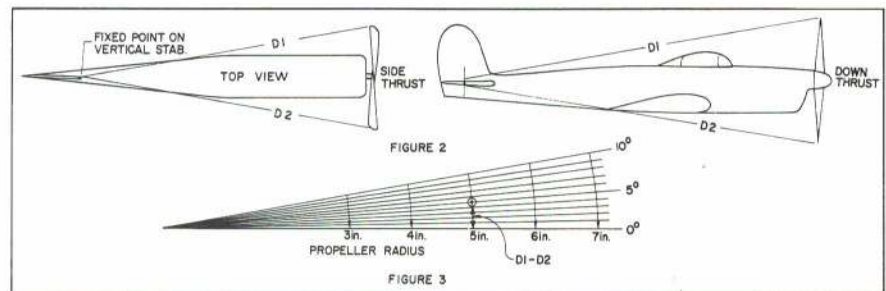
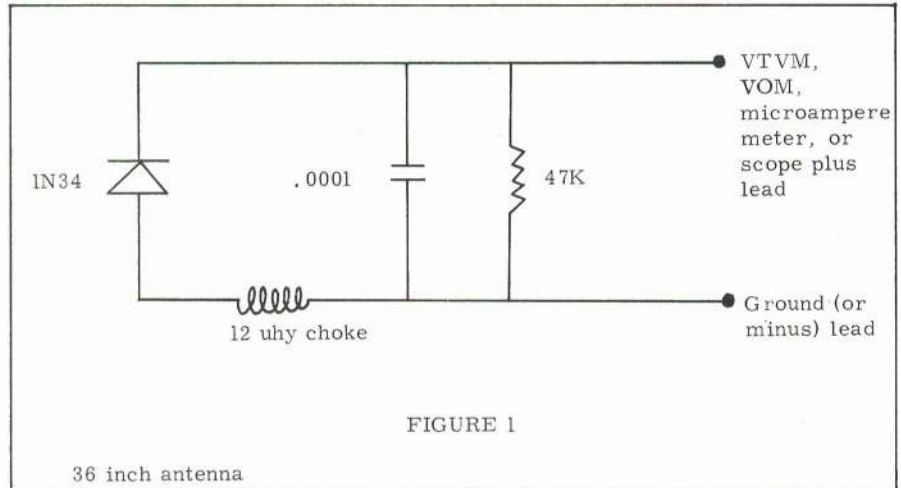


and literally take a photo of the photo. A special copy camera set up sounds expensive (and is) but excellent results can be had with any camera capable of getting close enough. An ordinary 35-mm reflex with a portrait attachment will work fine, on a tripod or clamped to a box. Keep the subject material perpendicular to the camera and positioned so as not to show light glare from glossy-surfaced pictures. This process is much cheaper than commercially done copy photos and is safer, as well, because valuable scale documents need not leave your hands.

CLAUDE McCULLOUGH
SPECIALIST CORRESPONDENT

ELECTRONICS, AERODYNAMICS

Checking transistors: Thomas Black attempted to check 2N2924 transistors using a VOM (as discussed in our March 1970 column), but found the transistors seemed to show "open" during the check. To prove his point, he included one of the transistors in his letter! When checked with my trusty Eico VTVM, it showed no problem—a good transistor. Since



his VOM might not be scaled for resistances as high as the reverse resistance of the transistor. I checked it on an older VOM, and this was found to be the case. Don't despair over a VOM which doesn't go to megohms. If the reading achieved in the opposite direction isn't also infinite (it should be quite low), the transistor is all right.

Tom suggests that transmitter output may be peaked by clipping the leads of a VTVM together then wrapping them around the transmitter antenna. Using the voltage scale, adjust transmitter output tuning coil or capacitor until maximum deflection of the indicator is reached. You must know what you are doing—tuning of the RF oscillator isn't permitted unless you have a 2nd class operator's license.

This method works, but a more accurate and reliable reading is obtained by using the demodulator shown here. Connect the VTVM (or a sufficiently sensitive VOM or a 500 micro-ampere meter) across the demodulator terminals and you have a field strength meter.

Of Interest To Beginners: One of Mike Corbet's questions is: when plans indicate down thrust and/or side thrust for the engine in degrees, how does the modeler estimate the correct amount? Experienced modelers usually "eyeball" it and come pretty close or take the coward's way out and measure the distance to some fixed point. A simple layout for the points to take measurements is given here.

The procedure is as follows. Mount the engine temporarily in place with one mounting hole drilled, usually the left rear corner, snug enough that it won't slip. Remove the glow plug. Measure the distance, D1, from a fixed point (straight pin) on the top of the rudder to the left tip of the prop. Now rotate the prop so that the same tip may be measured on the right, D2. This eliminates the possibility that the blades don't track uniformly.

The side thrust in degrees may be calculated trigonometrically, since the difference between D2 and D1, i.e., D1 minus D2 (for assumed right thrust) is a

trigonometric function of the propeller radius. D1 minus D2 equals propeller radius, R times the tangent of the desired side-thrust angle, which will be called A. As a formula:

$$D1 - D2 \approx R \text{ Tangent } A$$

Where A is in degrees and R is inches.

However, the preceding is cumbersome, so the diagram shown provides for direct measurement of D1 - D2. The example given is for 10-in. dia. prop wherein 5 degrees of thrust is required. Thus the measured distance D1 must be 7/16 in. greater than D2 for 5 degrees of side thrust. The engine must be twisted against the single mounting screw until D1 - D2 equals the proper distance. Then mark the other three mount holes and drill.

Down thrust may be determined similarly except that the fixed point is more difficult to find. However, a point on the stabilizer may be used without introducing too much error, provided that the stab is near the engine zero thrust line. Down thrust is achieved by shimming the rear mount points.

Car Radio for Two: From REVUP (official organ of ROAR) comes a way to get more service from one radio. Many car racers start with standard two-stick model plane configured radio systems and modify the stick assemblies to satisfy their needs. In most cases, just two functions are used: steering and throttle. This leaves two functions unused. It is suggested that these two unused functions may be utilized to control a second car, as follows.

Use the transmitter as usual to control the first car. Build a second control stick (or whatever arrangement is preferred) with two control potentiometers identical to those in the transmitter, usually 5000 ohms. Disconnect the wires from the two unused control pots in the existing transmitter and move them to a connector mounted on the transmitter. (I suggest that this be done through at least 10 microhenry chokes to avoid RF problems). Connect the auxiliary control box to the transmitter via a multi-wire cable such as flexible telephone cable. The new control pots now replace the unused functions.

Tune the second car receiver to the existing transmitter and plug the two servos into the two output functions controlled by the auxiliary control box. Now both cars operate from one transmitter. Costs are cut, and more cars may be operated.

The above process is termed multiplexing. Carried to its theoretical limit, a car racing group could build one transmitter RF and encoder with the maximum number of channels feasible within the 5 KC band width permitted. Assuming a repetition rate of 16 frames per sec., up to 12 channels could readily be multiplexed, or enough for six operators per frequency. Given the five 27 MHz channels (no tampering with transmitter layout on the 72 MHz channels is permitted), up to 30 operators could run simultaneously. Quite a race! Consider also the possibility of a master set at the local field with three fliers simultaneously per RC slot. This would certainly reduce the wait to fly but might be tough on flying. It also would alleviate the problems in team racing wherein more than one flier is on the same frequency.

**FRED MARKS
SPECIALIST CORRESPONDENT**

PYLON RACING

Pylon Racing Circuit: The western New York racing circuit starts the 1971 season early. The first race will be at the ARC's field near Syracuse on May 23. The circuit continues at Lockport, N.Y., June 27; at Buffalo, July 11; back at Lockport, Aug. 8; at Buffalo again, Sept. 5; and concludes at Rochester, Sept. 18 and 19, in a really big two days of racing for the UPRC championship.

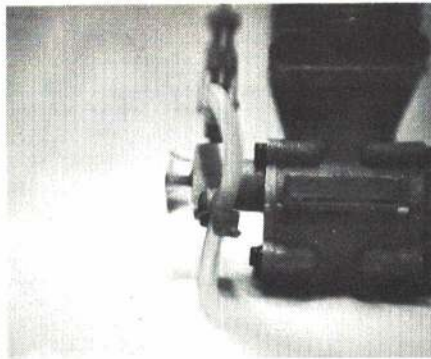
The UPRC is making a real effort to encourage newcomers to enter these racing events. One event is restricted to those who have not raced before or accumulated points in UPRC racing. Those in Western New York who have toyed with the thought of racing now have a chance to join in the fun. Contact UPRC at 49 Golden Court, Buffalo, N.Y. 14225. Phone: 716-633-6623.



Owen Penk, Montreal, Canada, with his well-detailed pylon racer. Looks big.

The Thunderbolt Is Back: If the Mustangs and Tiger Cats can do it, why not the old Jug? Fourteen-year-old Owen Penk has developed an extremely well-done version of the Thunderbolt. Congratulations, Owen, and good luck.

New Products: A sample of K&B's new fuel shutoff-valve for the 1971 racing season just arrived. The unit is extremely simple in operation and, therefore, should prove to be more dependable in ten laps of racing. Only



Need for idle or throttling is gone; only fuel shut-off required. See column.

one part, the actuating arm, could loosen in the air, rather than the several parts in the standard carburetor.

In operation, the actuator arm pinches off the pressure tube from the tank to the needle valve, thus providing a fuel cutoff. We recommend that fuel cutoff be used rather than fuel floodoff. K&B Manufacturing has encountered some cases of hydrostatic lock with floodoff. At 17 grand, this could be disastrous.

Good News for Quarter-Midget Fans: K&B hopes to have a new Pylon Racing 15 ready soon—so soon, in fact, hobby dealers may have them in stock now.

The Williams Brothers have added to their seemingly endless line another item—a nylon air-flow manifold which will pick up carburetor air, zing it around behind the firewall and throw it forward through the firewall and into the carburetor. It's an easy way out for those who string a lot of 3/8" air-transfer tubing around the fuel tank area.

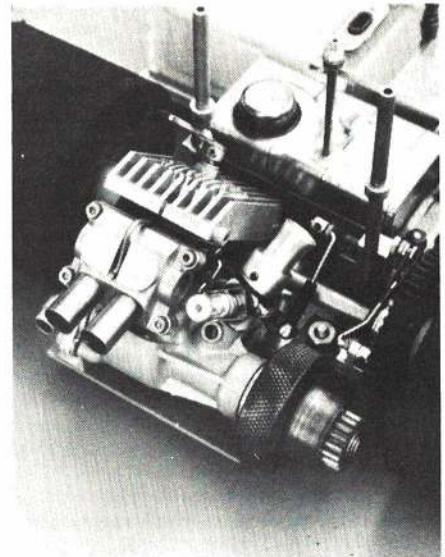
**BOB MORSE
SPECIALIST CORRESPONDENT**

RC CAR RACING

Big News in Cars: Jerobee Industries, York Center, Redmond, Wash. 98052, have released a completely assembled, ready-to-run 1/12 scale car costing less than \$90 with engine, radio and all components included. While this car does not conform to the 1971 ROAR national racing rules, it nevertheless represents an important milestone. It permits even the most broke or the least experienced beginners to start RC racing, and it requires less space (but a smoother surface) to race on. When the sheer number of these cars makes it necessary, ROAR no doubt will recognize them and make them a part of a regular national racing program.

Exciting Track News: California now has two permanent tracks where cars can be raced at any time.

Roy Moody's newest Formula car shows aerodynamics is important for RC cars.



A true rear-engined RC car, it uses many Associated components. Also is compact.

The world's first commercial track for RC cars is in Pomona, Calif. turns and spring-loaded crash barriers. Motor-driven starter wheels are available for the drivers, as well as an elevated platform which affords better visibility. The track is open every day from 10 a.m. to 5 p.m. Running or spectating costs are nominal, and a fully-equipped hobby shop on the premises is operated by John Thorpe.

The other track, painted by members of the Orange County RC Car Club on the parking lot of the famous Briggs Cunningham Automotive Museum, is located in Costa Mesa, at Red Hill and Baker Sts. This track measures 626 ft. to the lap and has 8 turns. Lines of the track are 8 in. wide, spaced 9 ft. near the drivers and 15 ft. on the back straight. White paint was used in the straights while yellow is used on the outside of each turn and red on the inside for easy identification. Races are held on the first Sunday of each month, but practicing can be done at any time, provided that the user cleans up the area afterwards and watches for oil spills (use cardboard or old carpeting).

Those who wish to paint their own race track should keep some basic considerations in mind. Lay out the track with tin can tops first to determine that it is comfortable to drive on and has good visibility. Next, chalk the lines on the surface, using a string compass in the turns (to ensure smooth curves) and then connect them with straight-line tangents.

For paint, use white vinyl stucco paint and roll it on with an 8-in. wide roller. Figure about a gallon of paint for every 120 ft. of track line. Low-cost but good quality paint can be purchased from Goodman Paint Co., 12316 E. Carson, Hawaiian Gardens, Calif. (213-420-1219) They will ship the paint, which costs less than \$3 a gallon.

Nationals in Washington: It is definite now—the 1971 Nationals will be held in Washington, D.C., July 3 and 4. Cars to be entered must conform to the new racing rules. They are available for 25 cents from ROAR, 2855 Velasco Lane, Costa Mesa, Calif. 92626.

New Racing Clubs: Contact Richard Bowman, 121 Tupper Cr., Apt. No. 6, Kitchener, Ontario, Canada; Lee Parker, 24 Green Lynne Dr., Levittown, Penna. 19057; Dean Schulman, 16 E. Broad St., Columbus, Ohio 43215.

**GEORGE SIPOSS
SPECIALIST CORRESPONDENT**

Fly it with small digital, Galloping Ghost, or go free flight! Any way, it flies slowly and looks real.

THE AIR WAR, during WW I, was waged on a month-to-month basis. From 1914 to 1918, an aircraft design was effective for about four months. A plane gradually built up to its peak of operation, stayed there for about four to six months, and then slowly declined into obsolescence.

In 1915, the German Fokkers, equipped with a machine gun which fired through the propeller, were knocking down Allied planes with ever-increasing regularity. A ship capable of combating them was desperately needed. The Sopwith Aircraft Co., Ltd., worked feverishly to replace their now-obsolete Sopwith 1 1/2 Strutter. Finally, in January 1916, the plane which was to become known as the Pup first flew. By February 6, 1916, acceptance papers were signed and production of this little jewel began.

The Pup, which spanned 26 1/2 ft., was a much smaller plane than the 1 1/2 Strutter. Using an 80-hp Le Rhone engine, its all-up weight was 787 lb. Later, performance was bettered with a 100-hp engine at only a slight increase in weight.

Early in March, the new planes started to reach the Front. Pilots in the English Sector, who were the first to receive the Pups, were jubilant over their performance. They were easy to fly as compared to the Camel, which had bad spin characteristics. This little Pup could take off with a run of only 100 ft. and came in for a landing at only 30 mph.

The plane got its nickname from the pilots who considered the Sopwith 1 1/2 Strutter

the Dad, and the new plane the Pup. The British brass thought that Pup was an undignified name and gave orders not to use it. But the order was never heeded.

The model of this jaunty and frisky little plane was designed with pulse proportional (Galloping Ghost) in mind. Wing loading comes to only 11.4 oz. per sq. ft., since the total weight is 24 oz.; total wing area, 394 sq. in. An Enya 09 RC engine does a respectable job of flying the plane in scale-like fashion.

The large control surfaces may cause some eye-popping at first, but only the inner holes on the Rand actuator and the outer holes on the control horns are used. Total throw is about a half an inch. Those who are brave can use full throw, put in a 15 engine, and get some real combat action.

The Pup is a fine fun flier. Its dimensions are not exact enough to win a scale contest but, when that tail lifts on the takeoff, and the ship gently lifts into the air, that's modeling at its best.

Construction

Fuselage: Cut out 2 parts of F5 from a firm grade of 1/8" sheet balsa. Lay out the remainder of the side view, using the balsa size indicated on the plan. Glue each joint well with white glue and let dry overnight. Make the other side view the same way.

Join the sides with the crossmembers. I usually sketch the top view on my building board and assemble the sides directly over it. Cut out F3, F4, and F5 and cement or glue to the fuselage. Next install the stringers.

Cut out the firewall. For an 09 engine, 1/8" ply will do, but 3/16" ply is more versatile and can be used with the larger engine. Use epoxy to fasten the firewall to the fuselage and let set overnight. The firewall must be exact in size.

Find a can, bottle, or anything the same diameter as the completed firewall for construction of the cowl. Details are covered on the plan. Note that two layers of balsa will form the ring. Seams on the two layers are staggered, but the grain must run the same way. Add the 1/4" balsa rings in front. Let dry, then carve and sand to shape. Silk is glued on the inside ring part of the cowl to add strength and rigidity. Do not glue any silk where the rear edge of the cowl fits on the firewall. It might make the fit too tight.

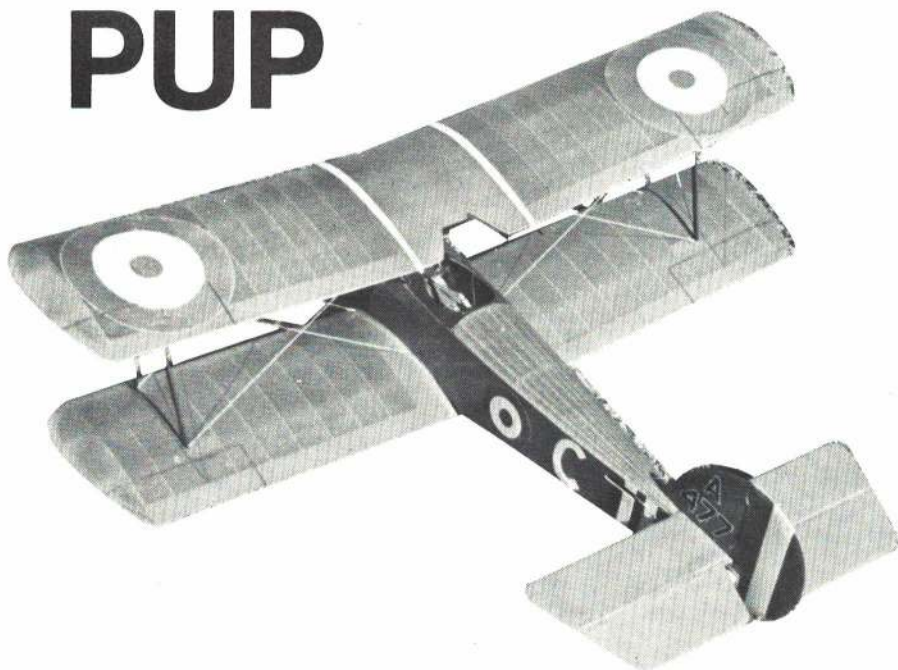
Carve and sand the side blocks behind the cowl, but do not glue them in place. Next carve the top of the fuselage in one piece and hollow it out to about 3/16" thickness. It fits in the space from the rear of the firewall to the rear of the cockpit.

Bend and shape the center section struts. Note the 1/32" music wire crossbracing. Solder all joints. Then line the inside of the fuselage in area F5 with 1/32" ply, using contact cement for adhesive.

Fit the landing gear mount to fuselage and

by JOE HANKES

SOPWITH PUP



epoxy well. Add the blocks in the corner to attach the mount to the firewall securely, since this area is one of great stress. Install the center section struts to fuselage using J bolts and epoxy well. Glue cowl blocks to fuselage side, then add the stringers. Make the tail skid as shown. A wire one would do, but this one duplicates the real one. Put a 1/8 x 1/4" strip inside the fuselage along F5 (on top of the fuselage) to act as a stiffener. The fuselage is then complete.

Stabilizer and Rudder: The stabilizer and rudder are cut from light C grain stock and all the edges rounded. Use hardwood for the elevators. Attach firmly, using epoxy only. I used heavy dacron thread to sew on the hinges, but any good hinges may be used. They must operate freely since pulse flying will not tolerate any stiffness.

Wings: The center section of the lower wing is built only from the leading edge to the rear spar, the rest is omitted. This section must key into the wing saddle accurately and its bottom is covered with 1/16" plywood. On the top wing, the center section is covered top and bottom with 1/16" balsa. I key the front of each rib into the leading edge about 3/32" because it adds considerable strength. When both wings are complete, sand thoroughly to make a smooth covering job.

Covering: For a more realistic effect, I used silk, which must be shrunk with water to draw it taut. However, any covering material desired may be used.

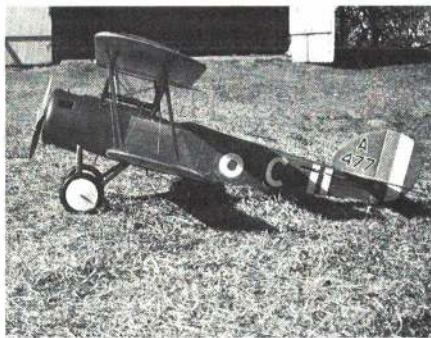
Doping: To keep the plane light, I used five coats of 50-50 butyrate dope clear. For a tinted coat, Rit dye can be blended into the dope as follows. Soak the yellow dye in a small amount of water and strain through a nylon stocking. Do the same with the cocoa brown dye. Then mix the two, using mostly yellow with the brown as a tint. Stir in an amount of denatured alcohol equal to the liquid tint. Mix with the dope and spray evenly over the clear dope finish. Colored dope could be used, but go easy on it to prevent excessive weight buildup near the tail.

The authentic color of the cowl and fuselage top is aluminum. Struts may be a clear finish such as that produced by an orange shellac. Paint on the roundels, or use decals. Squadron markings differed greatly, and any authentic color scheme may be used.

Assembly: Bend the 3/32" music wire landing gear as shown. Epoxy the lower wing onto the fuselage and let set overnight. Incidence must be 0 degrees. Jig up this assembly so that it lines up from the top, side, and front. Then J-bolt the landing gear in place. Fill in the bottom of the fuselage with 3/32" sheet balsa and dope to match the rest of the paint.

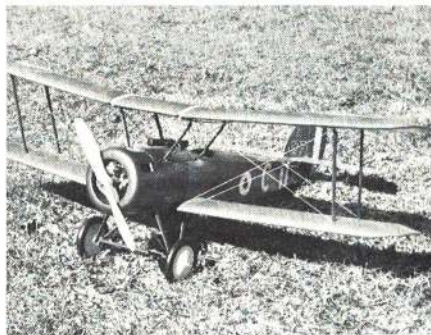
Cut and glue on the stabilizer platform, then the stab. When putting on the rudder and vertical fin, cut two notches into the top of the stabilizer. Make two corresponding notches on the vertical fin and cement in place. The vertical fin must be cut about 3/32" longer to allow for notching

Make the wing struts. Rubberband the



With reasonable nose and tail moments, the Pup has always been a modeling favorite.

While author made a built-up balsa cowl, an aluminum kitchen pan also might work.



upper wing into place, and install the struts and rigging. My rigging was elastic thread inked black and removable for flying.

Install the Tatone engine mount, centering the crankshaft on the center of the cowl. Cut out appropriate openings for the engine head and the exhaust. A small hole may be put in the bottom of the cowl for an oil drain. Make the opening around the engine head a little larger to insure adequate cooling. The two-oz. Veco tank lies horizontally behind the firewall above the radio equipment. Radio gear and its installation is up to the individual. I used a Controlaire 4 receiver, with a Rand pack and it operates flawlessly.

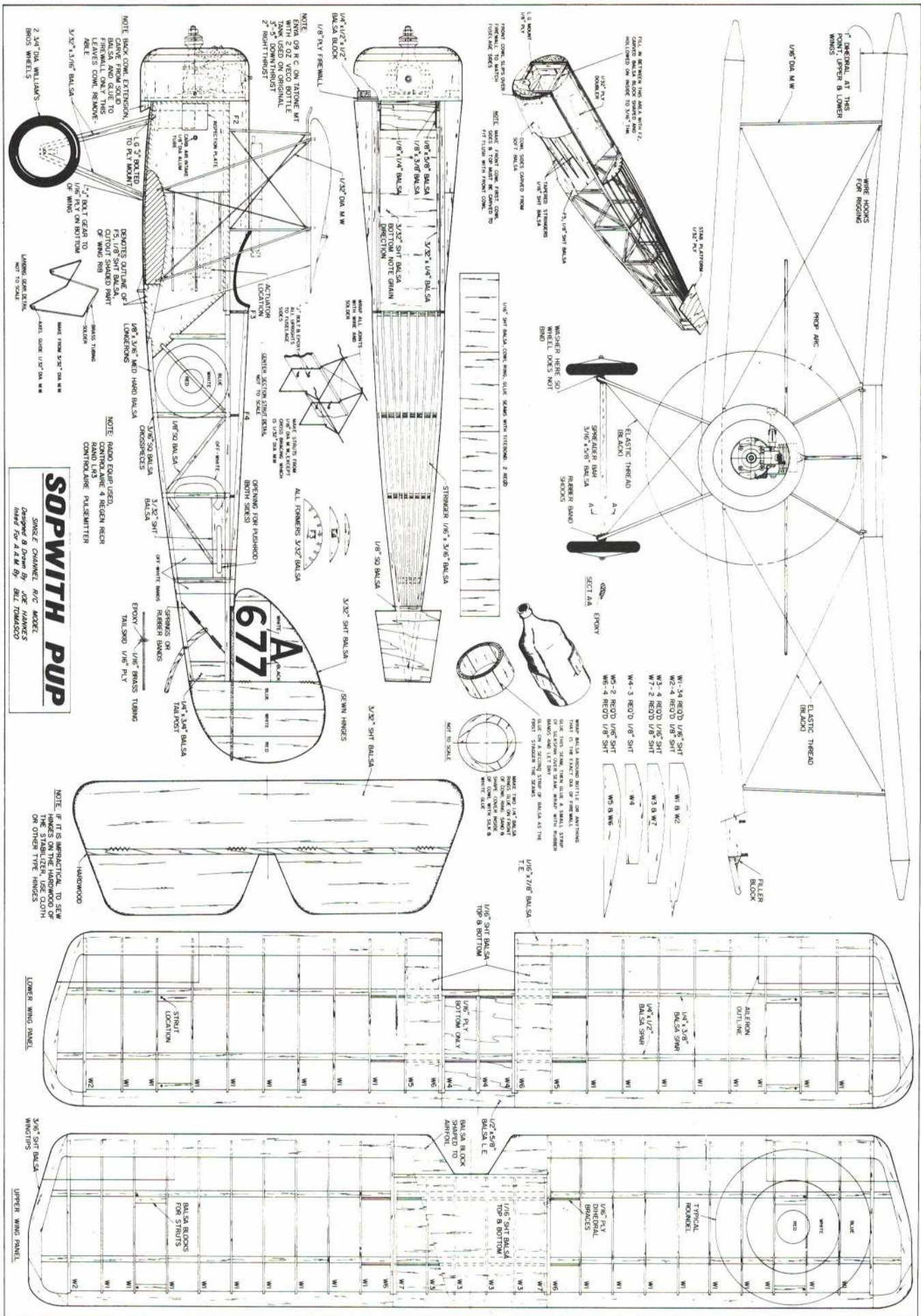
Carve and sand the spreader bar and groove out for the 3/32" music wire axle. Epoxy it in place. When set, rubberband the bar to the landing gear. Slip on the wheels and solder the retainers. The scale-size wheels are 2 3/4" (I used 3" because that is all that was available). The top of the fuselage from the firewall to the rear of the cockpit is fastened on the front by a music wire pin through the firewall into the balsa, and in the rear by a bolt to a crosspiece in the fuselage. The crosspiece is located near the front of the Rand actuator.

Flying

Check out the pulse system so that the elevators and rudder pulse are in neutral. Hang the airplane by a string located at the center of gravity and correct any wing heaviness. When the CG is within bounds, the Pup is ready to go.

With the Enya going full blast, I began the first flight by signalling for the release. I gave it a bit of forward stick and up came the tail. After almost 75 ft., the ship lifted and climbed out. Since it always wanted to turn left, a little more right thrust was needed. After about a minute of flight, I eased the ship onto the final and throttled down. With a little trim, in it came. There was a decided ballooning tendency on the flareout on landing. Take it easy on the control movements.

Biplane fans have a lot of enjoyment in store for them. If flying with three servos, use 3/32" wire on the center-section struts. No rigging or struts were used for flying; however, they could be if made light in weight.



SOPWITH PUP

SINCE CHANGE R/C MODELS
 FROM DAY TO DAY, THIS MODEL IS
 MADE FOR A.C.M. BY
 BILL TOMASCO

NOTE: IF IT IS IMPRACTICAL TO SEW
 HINGES ON THE HARDWOOD OF
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LOWER WING PANEL

UPPER WING PANEL

3/16" SHIT BALSAM
 WINGTIPS

WINGTIPS

WINGTIPS

WINGTIPS

WINGTIPS

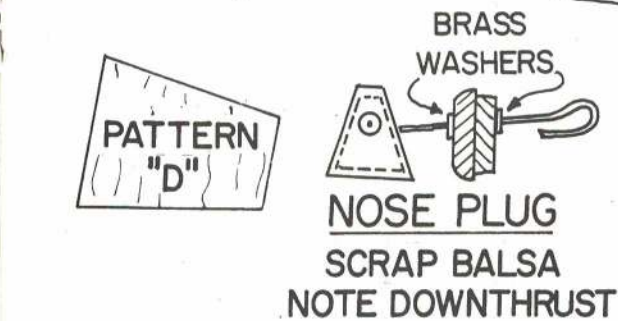
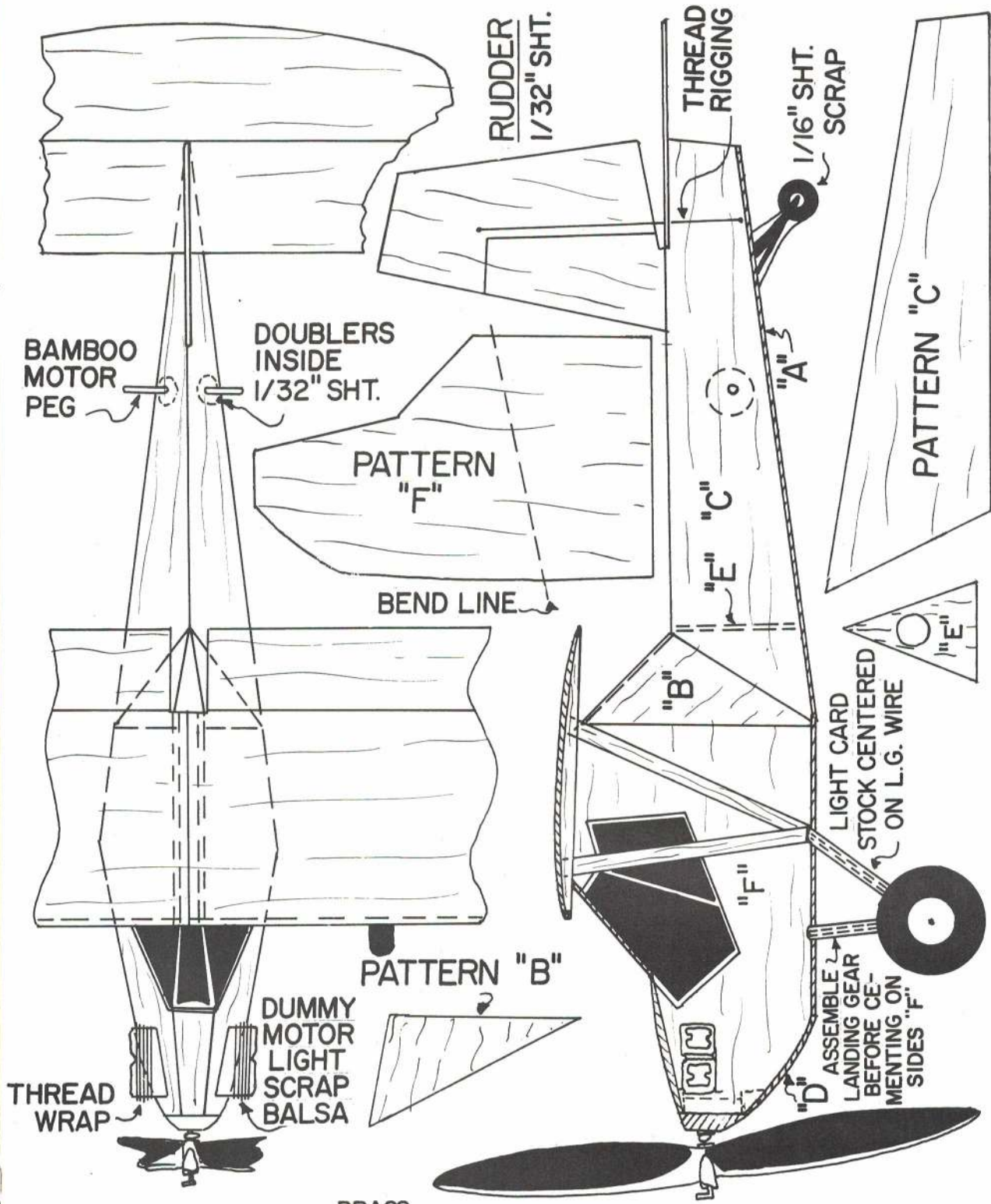
WINGTIPS

WINGTIPS

WINGTIPS

WINGTIPS

WINGTIPS



"SUPER DELUXE" PILOT ARF'S

There are various degrees of almost-ready-to-fly airplanes. Some are finished to a higher degree of almost ready to fly-ability than others. If you look at some of these Pilot airplanes, I am sure you will agree they have added an extra dimension into the art of preparing an almost-ready-to-fly model. To get a real nice job on the Cavalier, which is the flagship of the Pilot line, you should spend two evenings. This includes radio and engine installation. The other planes should finish up in an evening. Wherever possible, the aileron and rudder are on and hinged. The Cavalier and the Shell Fly "B" are superb low wing, high performance, airplanes. The high wing symmetrical section Sky Wagon with its long tail moment is an

especially fine acrobatic trainer. The Olympia and the Cessna Cardinal are excellent 3 channel beginner's models. The little Piper Cherokee, being a low winger, might frighten some beginners but, with the dihedral that this model has, it is a beautiful and docile 3 channel airplane. We would recommend a 60 size engine for the Cavalier, a 40 for the Shell Fly "B" and the Sky Wagon (or maybe a 35), and a 15 to 19 for the Olympia, Cherokee and Cardinal. Because of the extra effort that has gone into these Pilot kits they are a little more expensive, inch for inch, than many almost ready to fly models. For somebody who highly values his time, we think that even at the slightly increased price the extra finish is well worth the effort.

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Engine 60
R/C Mech. 4 Ch

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Wing Span 51.21"
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Wing Span 46.48"
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Wing Span 46.06"
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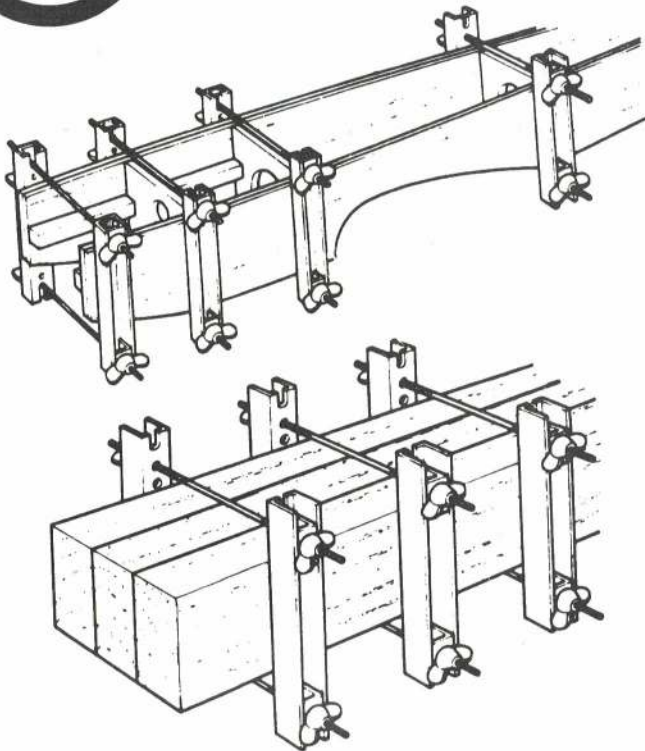


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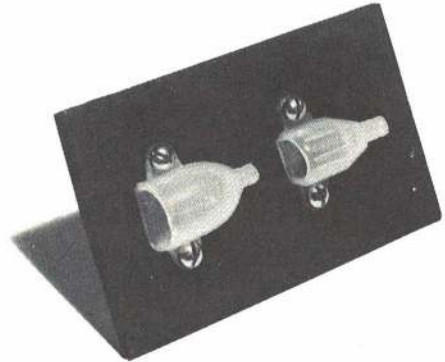


"H" CLAMPS

These clamps can be used in fuselage construction or many other ways in the workshop. This is something we have needed for a long time to keep fuselages square, etc. These are packed two in each package.

2.50 Catalog No. IM0068

RAM AIR FITTING



This is an air scoop package, contains two scoops to a package and comes complete with the wood screws necessary to mount them to the side of your fuselage. These air scoops act like a supercharger and the air rams into the scoop and then on into your fuel tank. You connect the vent line from your fuel tank to the back of the scoop. Our tests indicate that the real payoff on these air scoops is in the idle. They just seem to make the engine run a lot more solid than without them. It is something we have needed for a long time. Incidentally, there are two different sizes in each package, one large and one small.

.50 Catalog No. IM0065



GRIP TUBING

This large heat treat tubing is used to hold a push rod wire into a push rod dowel. The small size works very well with 1/4 inch dowel. The large size is recommended for use with 5/16 inch square balsa push rods. Another very clever idea from IM Products.

Push Rod Keeper Tubing, Small .99 Catalog No. IM0066
Push Rod Keeper Tubing, Large .99 Catalog No. IM0067



PILOTS

One of these pilots is 2 inch scale, the other is 1 1/2 inch scale. These pilots come in white plastic. We recommend that you use some sort of enamel to paint the pilots. The pilots seem to be made of a material similar to that which tanks are blow molded from. These are really sharp for open cockpit type aircraft. In order to form these pilots it was necessary to make them so that the legs come off. These can be put on permanently with a little plastic cement.

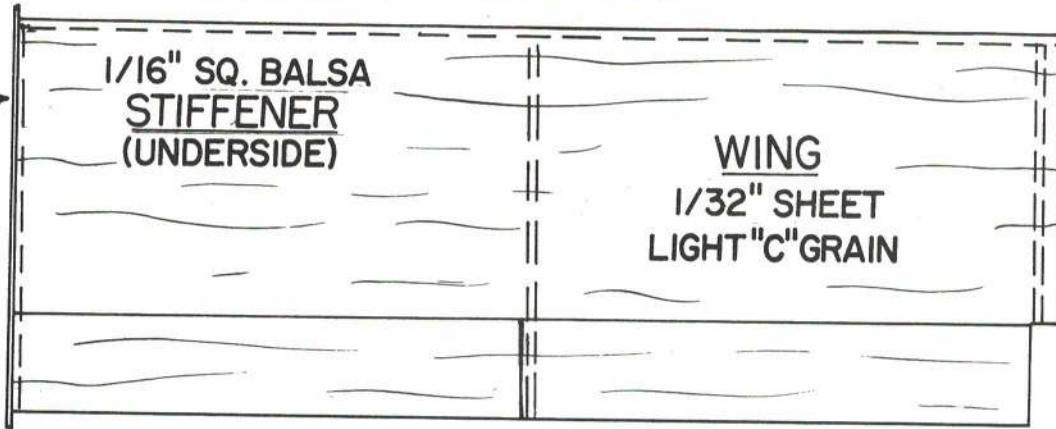
1 1/2 inch scale IM Pilot
2 inch scale IM Pilot

2.50 Catalog No. IM0069
2.95 Catalog No. IM0070

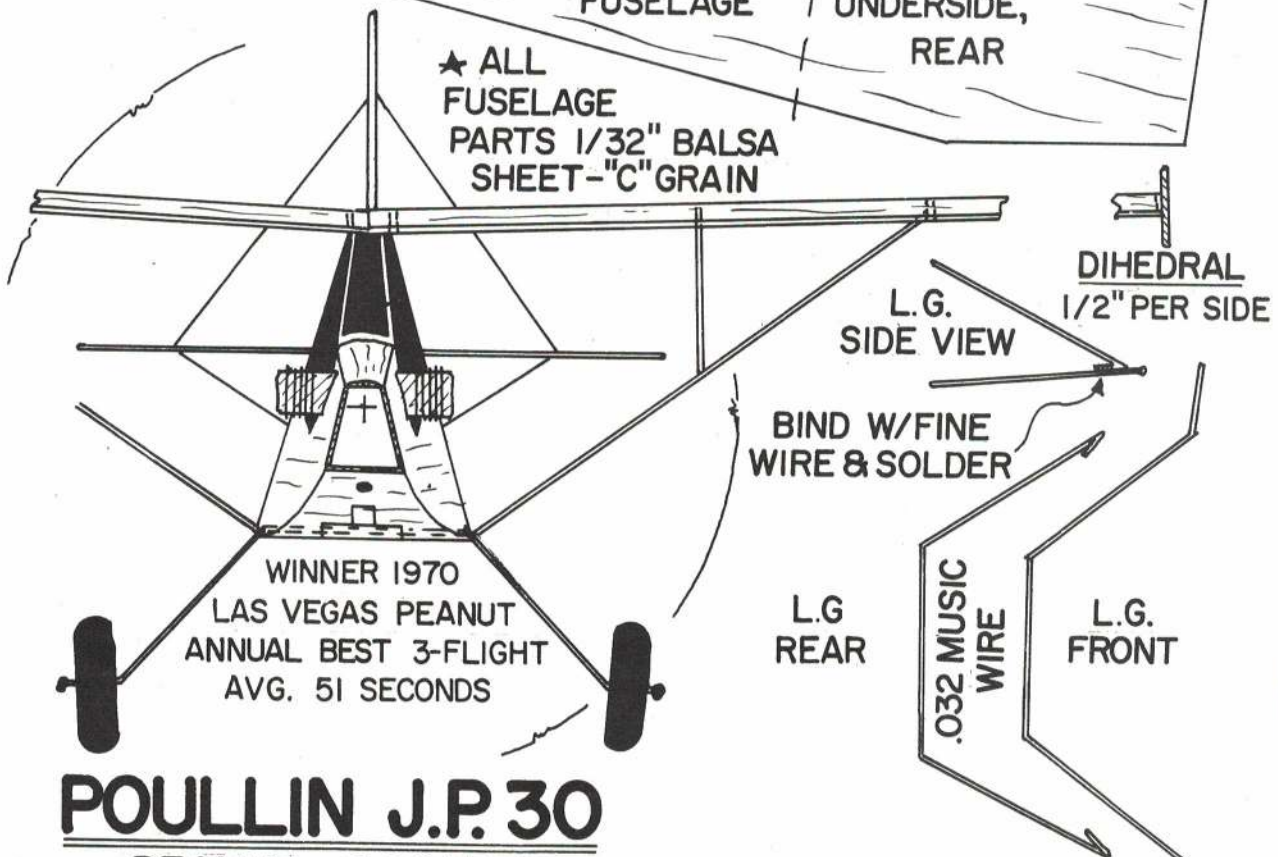


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BY BILL WARNER

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REDUIT D'AVION MARCH 1959

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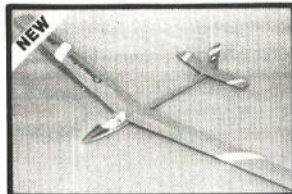


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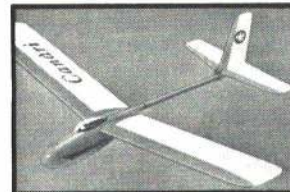
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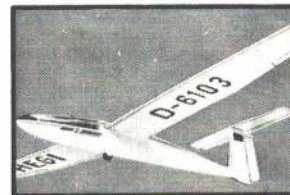
TWIN COMANCHE



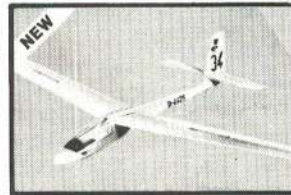
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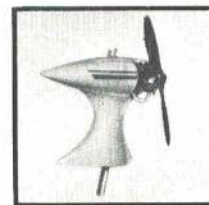
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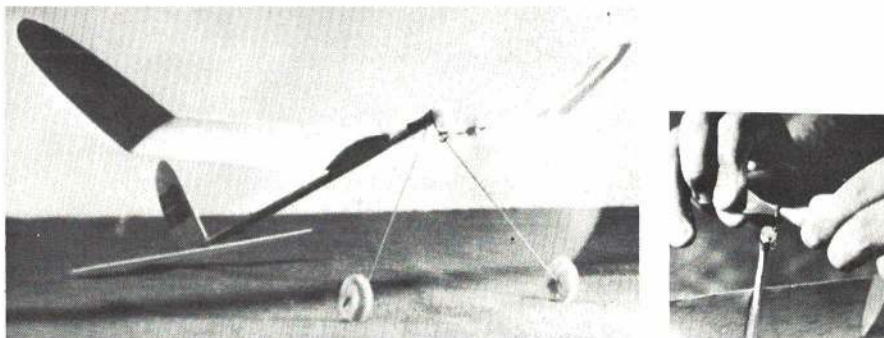
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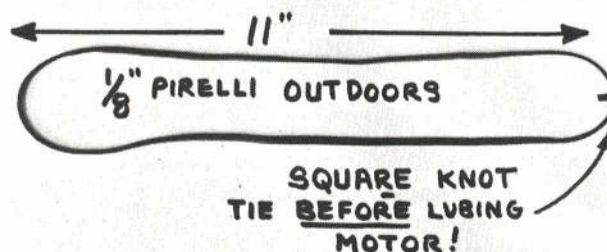
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Optimizing flight performance of a simple dimestore ready-to-fly plane is challenging fun.



Left: Twisting more pitch into propeller makes it run longer and slower. Lower: Your hobby shop should stock contest rubber. Prepare several motors as shown.



by BILL WARNER

SUPER SLEEK STREEK



MAKE SEVERAL IMPROVEMENTS to the readily-available Sleek Streek by North Pacific Products, and the result is a fast-climbing, fire breathing, high-performance model. During ten years of working with junior-high-age modelers, I have seen hundreds of Sleek Streeks built and flown. With care they can top a minute consistently, indoors or out. Many have flown out of sight at five minutes plus, while the best indoor times have run around two minutes, fifteen seconds!

Construction

Begin construction by sanding the wings, with a gentle touch, from the center towards the tip. A wing needs strength at its root but should be lighter at the tip to improve flying ability. However, tips should not be paper-thin, or else they may split or be too weak. A little airfoil may be sanded in or the curved shape on top of each wing emphasized in the direction of its natural curve.

Cut the wing tips off exactly where shown on the plan. Sanding the dihedral joints (where the wing changes direction) is probably the hardest job, so take your time. The trick is to sand a little bevel (angle) on each wing section, while keeping the wing curved in its airfoil shape. A sanding block and a couple of sanding fixture blocks (see plan) simplify this step. The fixture blocks hold the curve and the angle at the same time, while the wing pieces are sanded straight across the ends.

After sanding the correct bevel on each wing joint, spread a line of cement about the thickness of a fat pencil lead along the edges to be joined. Fit the joint together, rub in any extra cement which squeezes out, take apart and let dry to fill the pores in the wood. Repeat this operation a second time, but now

hold the parts together until dry. Holding the assembly is essential. Drying flat on the table will ruin the curved airfoil, which is necessary for top performance. To prevent warping or adding extra weight, wipe off any gobs of cement which are on the wing.

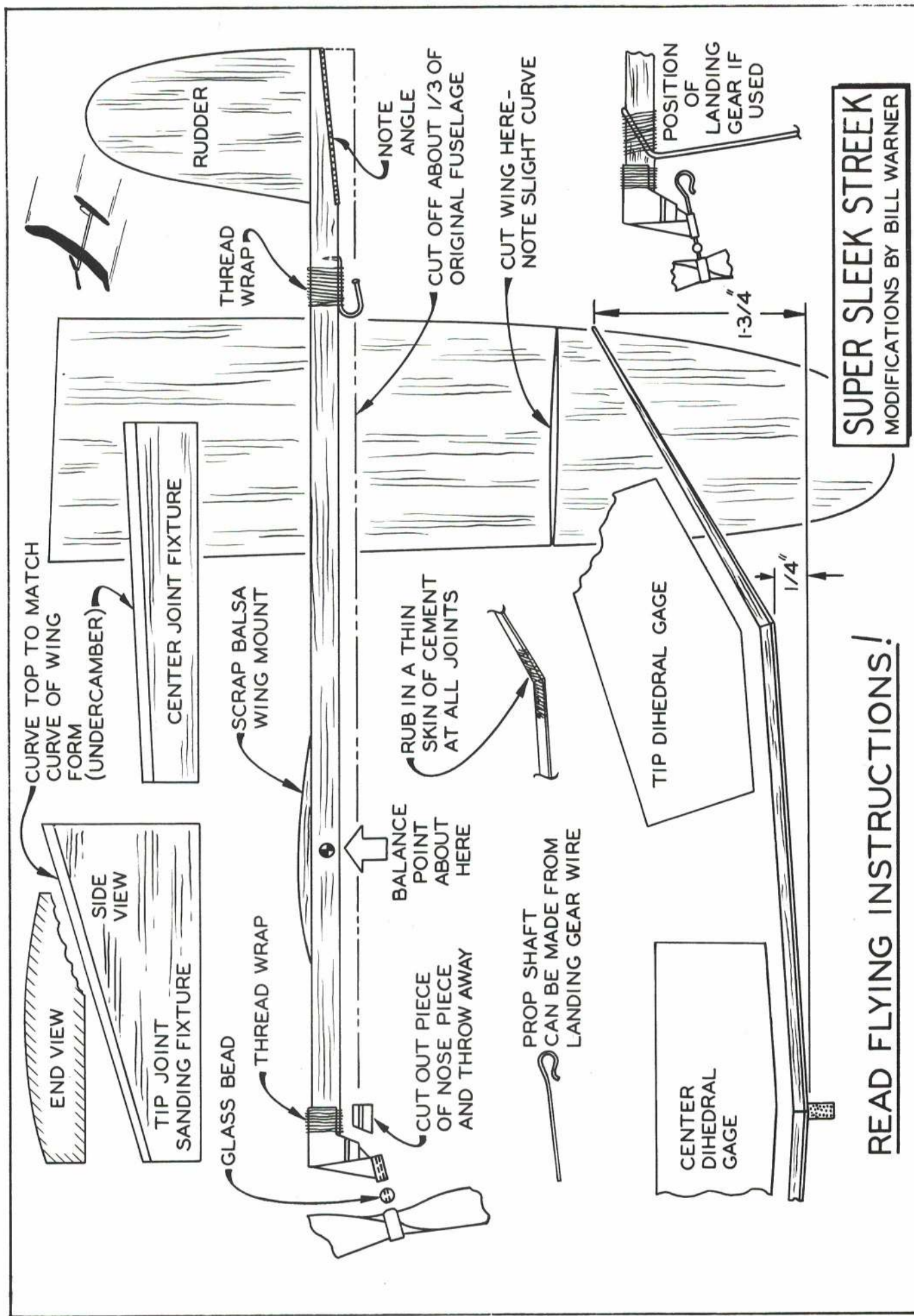
Pull the staple out of the fuselage (body) and cut down the bottom side to reduce weight (unless the fuselage balsa is very soft). Note the angle at the end of the fuselage where the stab will go later. Bend a pin for the rear motor hook and bind and cement it just in front of the stab position.

With a pair of pliers, take out the old prop shaft and throw it away. The new rubber motor would just climb out of the original hook. From the white plastic front-end part, cut out the piece (shown on the plan) to allow for rubber clearance. Cement the front end to the fuselage and bind with thread. Spread cement around it, rubbing into the thread wrapping.

Bend a new prop shaft out of 1/32" or smaller music wire. Round-nosed pliers are best, but needle-nosed will do. Practice on some softer wire first to get the hang of it. Assemble front end parts, using a glass bead between the front end and the prop. Bend the end of the shaft over at a right angle only when sure the prop is put on properly (at the prop's center is a little spiral ramp which faces front for free-wheeling when the rubber motor is out of winds).

Taper the stab and rudder slightly from the fuselage out to the tips and sand smooth. Cement these pieces onto the fuselage as shown. Then tie the rubber motor to be used and hang it between the prop hook and rear motor hook. Support the fuselage with a

(Continued on page 77)



getting started in RC

a layman's description of digital encoder.

by HOWARD McENTEE

ELEMENTARY DATA on how digital proportional systems work has been presented in past articles of this series, but some modelers have asked for a more detailed discussion (without being too technical) of the equipment they are using. This month, previous digital information will be combined with enough additional facts to show how these systems work, right through the receiver and servos to the control linkage.

This seems appropriate, since at least one single-control digital outfit is on the market, as well as many two- and three-control systems. To some extent, the latter have been taking over the jobs which until recently were handled by escapements, sequence-type servos, and even pulse propo equipment. Advocates of pulse propo feel such systems still have advantages over digital rigs (from personal experience, we have to agree). Pulse systems are bothered less by interference and

the pulser and tone modulator are omitted. The pulse setup seen in Part 27 is that utilized in the Heathkit GD-19 system, which is quite similar to that of most digital systems with five-control capability.

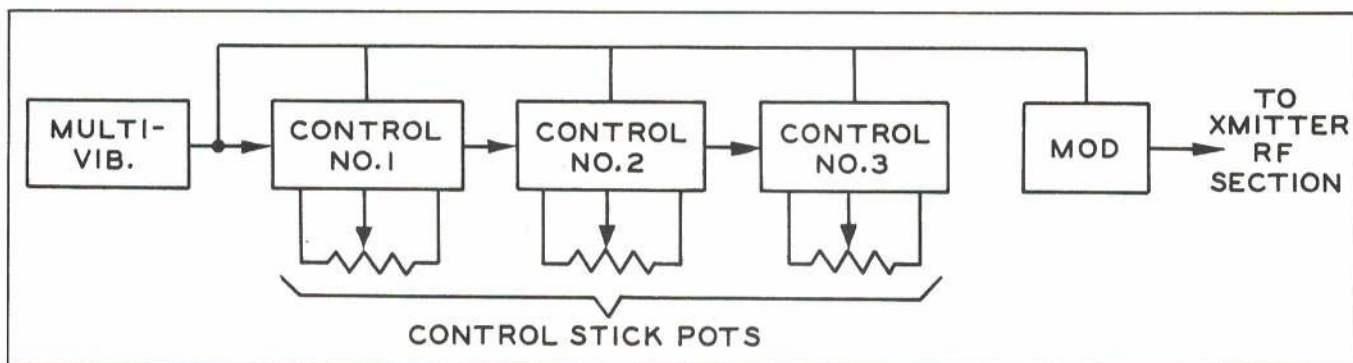
More detail of the encoder works is shown here. The box at far left comprises a free-running multivibrator, a form of oscillator circuit using two transistors which times the burst of each group of six pulses (discussed in Part 27). Actually, the multivibrator itself produces only one pulse out of each group of six—the lefthand one, sometimes called the frame-starting pulse or reference pulse. This is No. 1 in the series.

While all the other pulses (2 through 6) are shifted either to right or left by action of the control sticks, the reference pulse itself never shifts. The reference pulse goes both to the modulator and to the first box to its right

are the range pots, one for each control stick. Do not confuse these with trim adjustment levers, most of which work by mechanically shifting the body of the pot, while its shaft remains steady, held by the stick mechanism. Thus trim is essentially mechanical.

The range pots are the row of small trimming variable resistors seen on all decoder boards. They govern the actual distance a servo will move when the associated control stick is moved to full maximums. They must be set so that the servo does not jam at either end of its range, when maximum stick movement is given to one side and maximum trim to that side at the same time.

As the sketch indicates, each monostable timer (labeled Control No. 1, etc.), except that at far right, sends a pulse to the following timer. Each also sends a pulse to the modulator. The latter (in the Heath system)



are much simpler (far lower parts count), much lighter and more compact. A single-control (pulse rudder) plane system may weigh about half an ounce; digital cannot come close to this and probably won't for some time. However, digital has its advantages: precise powerful action to all controls, lower battery drain, and capability to handle half a dozen or more controls with absolutely no interaction. Let's look into how these advantages come about.

The interested reader should review the digital concept as described in Part 27 of this series (p. 17, Feb. 1970 AAM). A sketch of the pulses sent by a five-control digital transmitter was presented and will be referred to below. Where do these pulses come from and how are they used to move the controls? They are produced by an encoder in the transmitter. The string of pulses goes through a modulator, then to the RF circuitry of the transmitter. The RF section was described in Part 35 (p. 42, June 1970 AAM). To the left of the dotted line are the encoder and modulator; when these are in the transmitter,

(labeled Control No. 1). Here a single-transistor circuit produces the second pulse in the series of six. The control stick pot for No. 1 can shift this pulse to either side of neutral as desired by the operator. The stick pots are those varied when a control stick on the outside of the transmitter is moved. Heath calls each of the three control units shown monostable timers.

With controls in neutral, No. 1 times its single pulse output to exactly 1500 μ sec. from the moment it receives the reference pulse. No. 2 times its single pulse exactly 1500 μ sec. from the moment it gets its pulse input from No. 1, and so on down the string. Only three control circuits are shown, but the Heath GD-19 system has five. Others may go to as high as eight.

When first setting up a digital system like this, the actual position of the pot shafts in relation to the control stick is varied, so that there is the required 1500- μ sec. spacing between all pulses, after which the shafts are clamped tight to the stick mechanism. Not shown here (to avoid complicating the sketch)

includes another kind of multivibrator called a monostable whose function is to turn all the pulses it receives into pulses of exactly 350- μ sec. length—the desired time for the transmitter to be turned off. In the Heath system, the oscillator supply voltage is cut off for these periods, the power amplifier has nothing to amplify, and there is a brief zero RF output. No matter how the pulses are shifted by the control sticks, the modulator takes any pulses it receives and processes them to uniform 350 μ sec. width. This is a form of modulation, just as is that produced by the tone modulator in a pulse propo transmitter, although it is utilized far differently in the receivers of each type of system.

We have tried to present just enough of the digital basics so that those interested will know what goes on when they move a stick (or even when they don't), but not so much intricate detail that the non-technical types will be swamped. To those who couldn't care less, we'll get back to more general RC matters in another issue or two.

CARL GOLDBERG

CG

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.

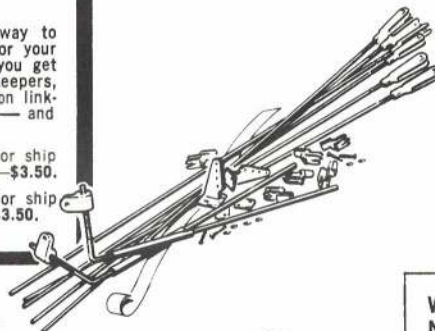


NEW—MAJOR R/C FITTINGS SETS

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.

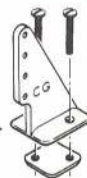
R/C Fittings Set No. 1 for ship with standard ailerons—\$3.50.

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



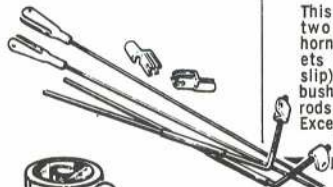
CONTROL HORNS

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.



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 BEARING

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



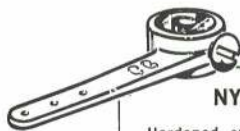
WIDE NYLON TAPE

This nylon reinforcing tape is extremely tough when applied with epoxy around the center when joining wing halves. 2½" wide x 5 ft. — 50¢



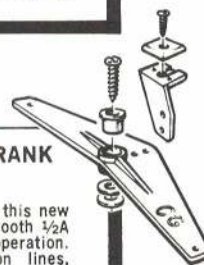
NYLON STEERING ARM

Hardened steel collar and screw — 75¢



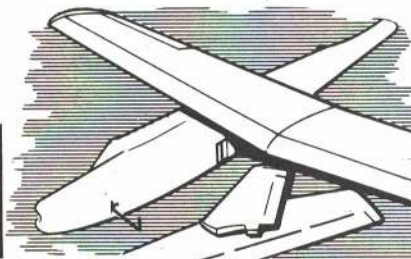
½A BELLCRANK and HORN

Made of nylon, this new set provides smooth ½A control line operation. Easy on dacron lines, too. 25¢.



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, nose gear, etc., \$8.95.

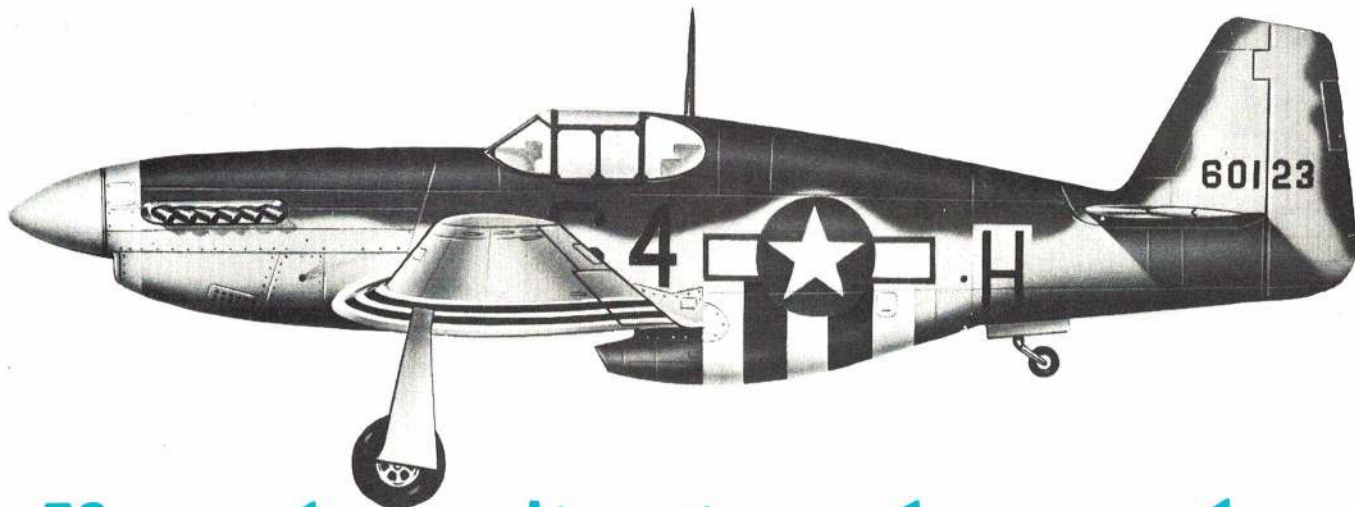


P. S. For best service, see your dealer for items you want. If not available, write direct; add 35 cents per item (75 cents outside U.S.). Minimum order \$1.00.

CARL GOLDBERG MODELS INC.
2545 W. Cermak Rd., Chicago, Ill. 60608
I am sending 20 cents for 8 pg. Illustrated Catalog with "Recommendations on Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

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CARL GOLDBERG MODELS INC.
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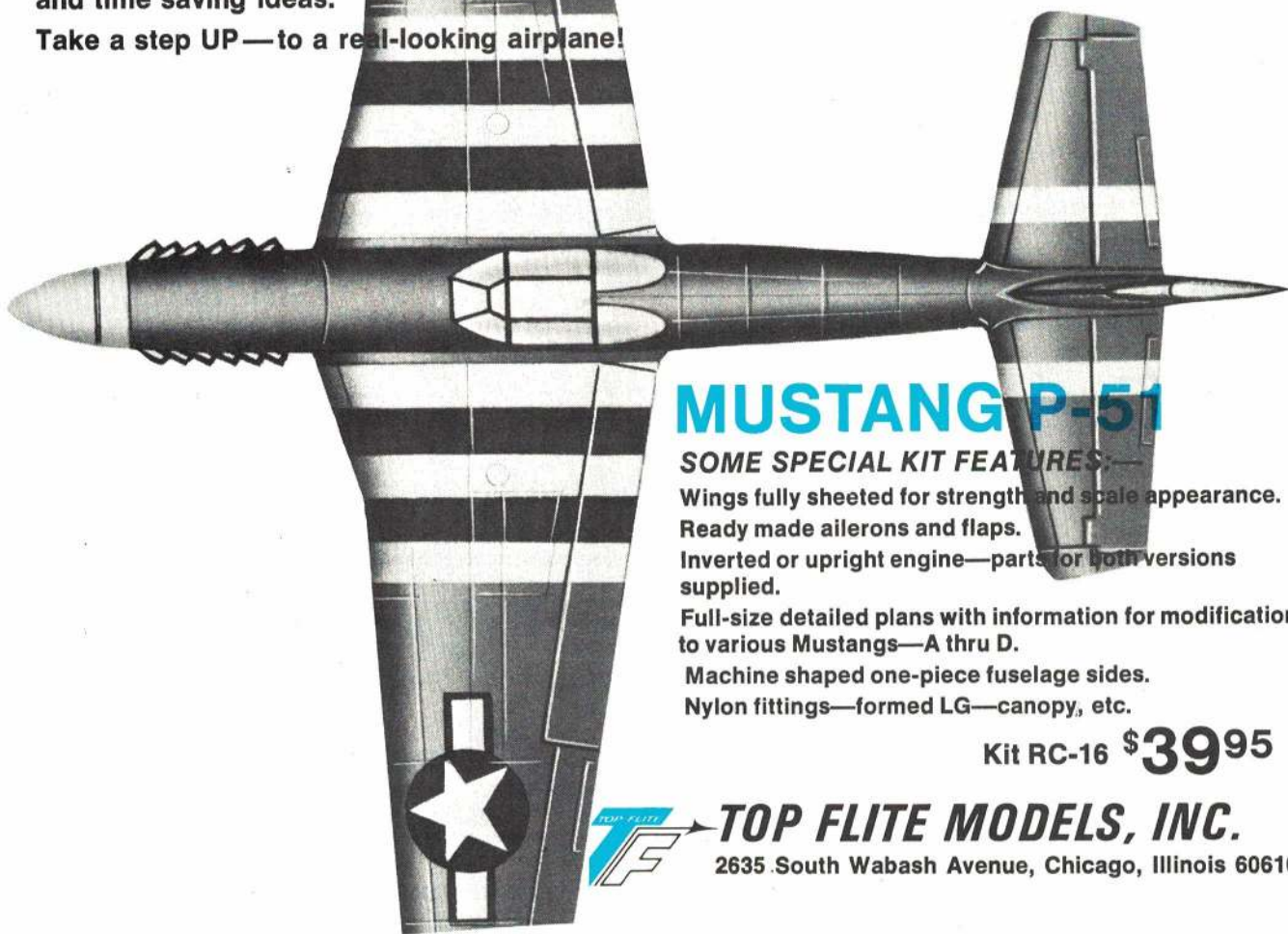
If you haven't yet made a scale model, there's no excuse—Now!

Our new Radio Controlled P-51 Mustang is a *Standoff Scale* model. You can build it in about the same time a Kwik-Fli takes, but when you're through, you've got a model that only a ruler can tell from a true scale plane.

This means that in the same building time of your next sport or pattern R'C, you could have instead *this Mustang* . . . an authentic-looking plane that flies like a sport model — no tricky handling.

Designed by Scale Champ Dave Platt, wing span is 60" for .40 to .60 engines and full house R'C. The flaps can be stationary or operable. And like all Top Flite kits, it has exciting new features and time saving ideas.

Take a step UP — to a real-looking airplane!



MUSTANG P-51

SOME SPECIAL KIT FEATURES:

- Wings fully sheeted for strength and scale appearance.
- Ready made ailerons and flaps.
- Inverted or upright engine—parts for both versions supplied.
- Full-size detailed plans with information for modification to various Mustangs—A thru D.
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- Nylon fittings—formed LG—canopy, etc.

Kit RC-16 \$39⁹⁵



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2635 South Wabash Avenue, Chicago, Illinois 60616



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

1970--AMA's Greatest Year--Aims at 1980

A year ago we celebrated a great occasion—the dumping of a financial deficit that has plagued AMA's operations for many years. The turnabout came about last year when AMA memberships reached an all time high (up to that point) of 27,000. Not only was the old deficit eliminated, but we came out a couple of thousand dollars in the black.

At a time when inflation was coming on strong, this was a great achievement. And a year ago it was hard to imagine topping the great progress of 1969. But in the AMA financial statement of that time, published in the June 1970 issue of American Aircraft Modeler, the trend was definitely up—with a still better year predicted to come.

That's how it turned out, but even more so than had been guessed. While the possibility of reaching the 30,000 member mark was indicated, nobody expected that we would go over 32,000. But we did! We actually increased membership about 5,000 over 1969's record year. In fact we ended up with double our membership of 1965.

When the books for 1970 were finally closed, AMA was at last in a strong financial position—not just barely in the black, but solidly so, with a \$30,000 surplus for the year's operations. We actually made more on interest (over \$4,200) than the amount with which we ended up in the black for 1969. It was all very timely, too, because we're now faced with some tremendous cost escalations.

This doesn't mean we're in danger of going broke, but rather that the big surplus won't go anywhere near as far as it might have just a year or two ago. Because everything is now costing so much, a good chunk of that surplus will evaporate in higher prices for postage, printing, personnel, programs and purchases.

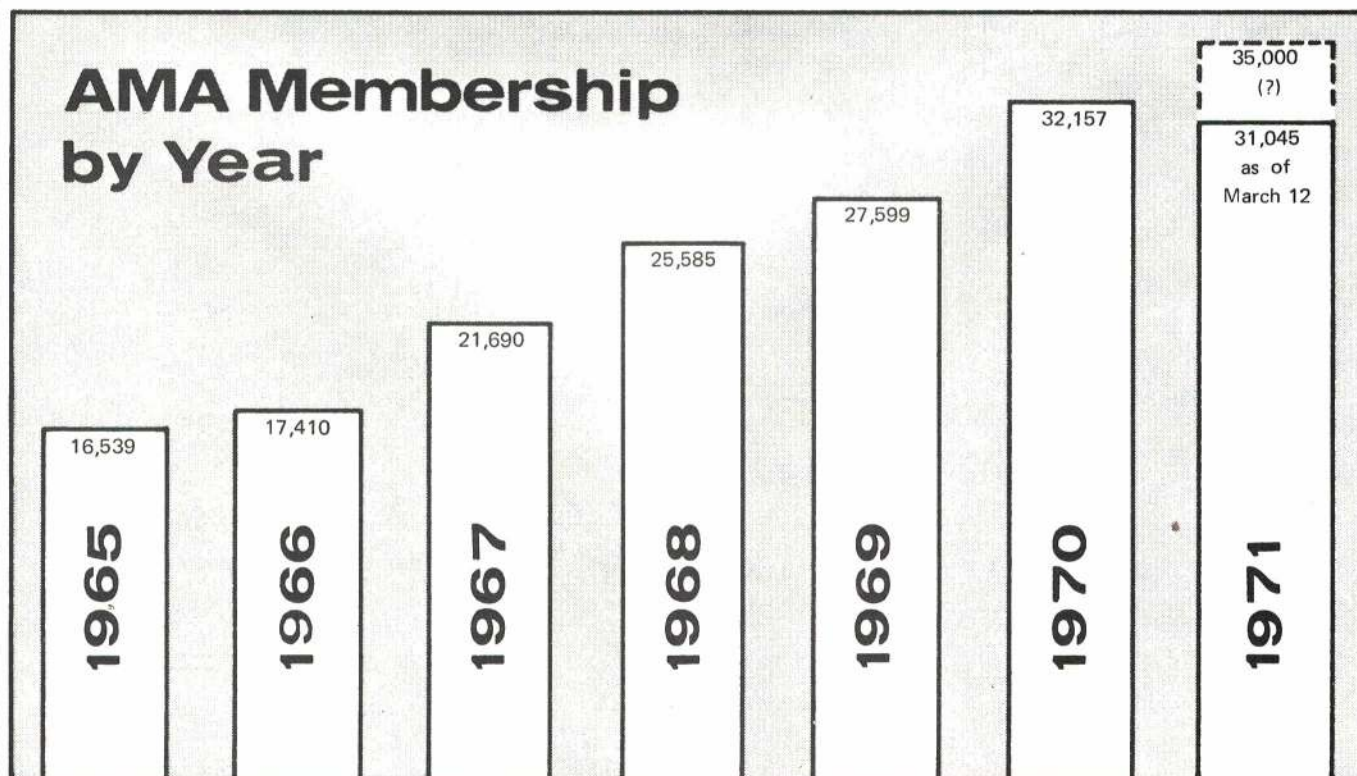
One program, for example, may get a huge increase in cost. This is the Nats (AMA's annual National Model Airplane Championships) which is faced with a major escalation. The Navy has hosted this event for over twenty years but with increasing difficulty since Vietnam has gotten to be a bigger problem. With

military budgets tightening continually, we reached the point this year where the 1970 event was faced with cancellation.

Not generally realized is that the Navy has spent at least \$15,000 in direct cash outlay for each Nats—beyond such cost factors as manhours and training interruptions. That much was spent alone on such things as tent and workbench rentals, portajohns, signs, supplies and hardware. In terms of PR and recruiting benefits returned, the Navy finally reached the point where such continued expenditures under current operating budgets could not be justified.

However, the Nats is still on for 1971, based on a revised concept which transfers much of the Navy's direct costs to AMA and/or other civilian support. In simplest terms this may mean that AMA has to come up with about \$15,000 more for the Nats operation, above the approximately \$30,000 we have been spending.

Note that the financial statement shows we spent about \$11,000 more than we took in for the Nats. However, the



expenses include about \$12,000 in apportionment of Headquarters staff salaries, so we actually came out a little better than break even on direct costs. With the new Nats financial situation, we're faced with the possibility of an operation costing almost \$50,000. That's big business and a measure of our growth that we can even think about such numbers!

In addition to the Nats cost increase possibility is another that involves the RC World Championships this coming September. Although this is planned to be a break even operation (even with thousands of dollars in donations) bad weather over the final weekend could lose a pile of money in spectator admissions and concession sales. With the possibility in view, a reserve fund will be necessary.

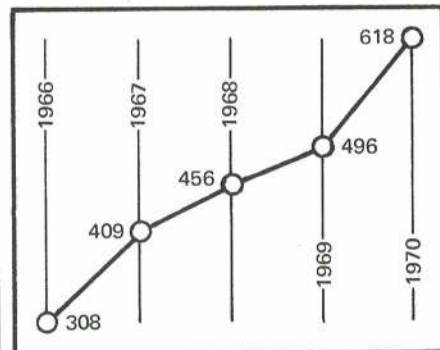
In other areas, there are plans for improved communications and PR, expanded charter club services, increased aid to Junior programs, more help on flying sites. A strong move in any one of these directions could require a big slice of the AMA finances. There's no question, therefore, about whether more will be spent—it's only a matter of deciding how much for what.

AMA's Executive Council, meeting in Toledo last February, had such decision-making as a primary agenda item. Prior to the meeting the basic preliminary budget for 1971, shown with the 1970 financial statement, indicated that still further growth of membership and operating surplus could be expected. In com-

AMA Budget Estimates—1971

(Includes Feb. Council Actions)

Income:	
Individual Memberships	
27,000 @ \$10	\$270,000
600 @ 5 (J/S w/mag)	3,000
8,000 @ 2 (J/S wo/mag)	16,000
Contest Sanctions	3,000
NAR Insurance	3,000
Mailing & Misc. Services	1,500
FAI Stamp Sales	2,000
Club Charter Fees	16,000
Non-Charter Meet Fees	800
Competition News Subs.	8,000
Total Income	\$323,300
Expenses:	
Salaries & Payroll Taxes	\$120,000
Rent	6,000
Telephone	3,000
Postage	15,000
Office Supplies, etc.	10,000
Public Relations Fee	6,000
Other PR	6,000
General Insurance	1,500
Legal & Audit	2,600
Membership Insurance	20,600
Membership Supplies, etc.	20,000
Model Aviation	83,500
NAA Affiliation Fee	3,000
FAI Expenses	5,000
Rule Books	4,000
Scholarship Program	2,700
HQ Incentive Program	3,000
Total Expenses	\$311,900
Excess of Estimated Receipts	
Over Estimated Expenses	\$ 11,400
(Nats & World Championships planned for break even operations.)	



Graph illustrates growth pattern of AMA chartered clubs—similar to membership growth.

parison with previous years when councils were concerned with survival of the organization in the face of deficit budgets, the challenge this year was exciting and different—money management to achieve the best balance of membership benefits for dollars allocated.

The results of the council meeting will be reported next month. Meanwhile it's fascinating to contemplate the fact that AMA is well on the way to again exceeding all previous records. In May of 1970, AMA had reached the 27,000 mem-

Financial Statement Note

*FAI Team Expenses: Scale Team \$610.65, CL Team \$1,411.50 Indoor Team 653.30, FF Team \$40.75, RC Team Selection \$84.80 surplus.

AMA Financial Statement

Year Ending Dec. 31, 1970

Balance Sheet

Assets

Current Assets:

Cash/Checking Account	\$ 90,734.33
Petty Cash	75.00
Cash/Savings Accounts	119,391.95

Accounts Receivable (owed us):

Nats Trophy Sponsorship	450.00
Misc. Accts. Receivable	1,093.24
National Assn. of Rocketry	699.56
Advances/Employees	806.46

Deferred Exp. (paid in advance):

Prepaid Insurance & Expenses	49,672.22
Supplies Inventory	2,439.04

Fixed Assets:

Furniture and Equipment	21,869.19
Less: Depreciation Reserve (9,915.05)	

Total Assets \$277,315.95

Liabilities and Net Worth

Current Liabilities (we owe):

Accounts Payable	\$ 6,492.33
Note Payable ('71 Ins.)	20,600.00

Deferred Income (service due):

Membership Dues/1971	182,989.50
Other	13,591.80

Program Entry Fees (in trust for team travel within U.S.):

Free Flight	11,654.65
Radio Control	2,748.73
Indoor	695.35
Control Line	236.25
Scale, General	81.85

Other Funds (also held in trust):

FCC Frequency Fund	2,090.97
Scholarship Fund	2,170.00
RC World Championships	1,218.25

Net Worth:

Surplus: From Dec. 31, 1969	2,494.00
Gain—12 months	30,252.26

Total Liabilities/Net Worth \$277,315.94

Expense Statement

Operating Expenses—by Department

Nationals	\$ 38,447.76
Membership	97,194.81
Magazine	101,115.50
Supply and Service	4,827.51
FAI Program	17,752.08
Contest Administration	9,760.00
Officer Services	3,805.37
General Administration	26,442.19
Total—All Departments	\$299,345.22

Operating Expenses—Detail

Salaries & Payroll Taxes	\$112,719.85
Rent	4,925.00
Telephone/Telegraph	2,618.06
Postage, General	13,379.89
Office Supplies	7,274.02
Public Relations, General	8,763.02
Travel/Trade Shows	365.88
Meetings	2,484.34
Insurance, General	1,638.63
Depreciation	1,713.33
Legal and Audit	1,189.25
Membership Supplies	12,462.25
Rule Books	3,867.60
Junior Programs	1,822.26
Insurance, Membership	20,725.00
Cost of Supplies Sold	1,782.51
Magazine, Purchase	67,076.73
Postage	8,195.77
FAI: Team Expenses*	2,631.40
Records (NAA Fees)	90.42
Franchise Fee	2,399.30
Miscellaneous	1,487.06
Uncollectible Accounts	241.20
Nats: Hobby Shop	2,620.33
Trophies	4,444.87
Officials' Fees	4,880.00
Travel/Officials, Staff	873.59
Helmets, Hats, Supplies	4,268.76
Appreciation Activities	850.15
Official Cars	1,554.75
Total	\$299,345.22

Income Statement

Operating Income—by Department

Nationals	\$ 27,355.38
Membership	106,664.20
Magazine	109,723.73
Supply and Service	4,881.40
FAI Programs	28,311.75
Contest Administration	15,172.00
Officer Services	7,737.00
General Administration	25,794.00
Total—All Departments	\$325,639.46

Operating Income—Detail

Membership Dues	\$257,943.00
Sanctions (AMA, FAI meets)	2,275.00
Sanctions (FAI Records)	674.00
FAI Stamp Sales	1,843.75
NAR Insurance	2,566.56
Supply & Serv./Subscriptions	4,881.40
Mailings services & serv. chgs.	2,932.40
Club Charter Fees	15,910.25
Non-Charter Meet Fees	770.72
Junior Programs	573.00
Competition News Subs.	7,914.00
Nats: Sponsorship	7,090.00
Hobby Shop	5,247.23
Entry Fees	15,018.15

Total Operating Income \$325,639.46
Less Operating Expense 299,345.22

Operating Gain \$ 26,294.24

Other Income:

Contributions/booster fund	291.67
Interest/savings accounts	4,266.35
Less: Interest Exp.	(600.00)

Net Gain—12 months, 1970 \$ 30,252.26

Respectfully submitted,

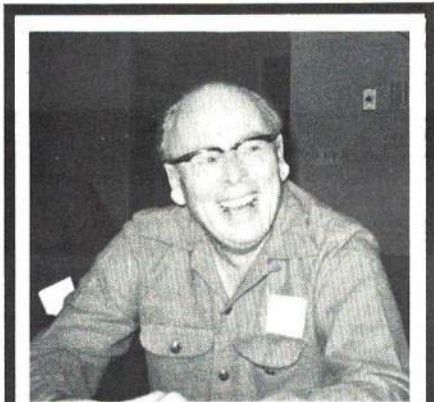
John Worth
John Worth, Executive Director

ber mark, on the way to a spectacular 32,000 total. This year the 27,000 mark was reached in February—three months earlier!

It's obvious that we're continuing the strong upward membership curve of recent years. And it appears that we're exceeding the pace needed to stay ahead of inflation. If so, the result should be a stronger and more dynamic national organization—able to do more and better for its members. By continuing that philosophy—to give membership more and better reasons for belonging—there is a reasonable potential of 100,000 members within sight. We doubled the membership in five years; we could triple it in ten.

Helping the situation is the fact that, while everything else is going up in price, there's no immediate need for a dues increase. AMA membership is thus a better bargain than ever, and is likely to stay that way due to a firm financial footing.

The budget calls for 35,000 members in 1971. Three times that will top the 100,000 mark. That's the foreseeable goal for 1980. If we can keep up the momentum throughout the seventies the way we've started this decade, we could have the greatest sport aviation activity in the world within ten years.



CHUCK BROADHURST

Charles H. Broadhurst, Jr., Age 49, passed away at his home in Sacramento, Calif., February 28th. Chuck was the current District X vice-president of the Academy of Model Aeronautics, current executive director of the National Free Flight Society, monthly free flight correspondent for American Aircraft Modeler magazine, past president of the Northern California Free Flight Council, and past president of the Capitol Condors Model Airplane Club.

Chuck's last official act for AMA was to meet with the other members of the AMA Executive Council at the group's winter meeting in Toledo. While there he wrote a statement in regard to his deep and devoted love for model aviation: "I feel very strongly in the need to maintain a strong national Academy of Model Aeronautics organization." These were probably his last words in a long career of writing and working on behalf of model aviation.

Air modeling suffers a deep loss at Chuck's passing . . . John Clemens, AMA President.

President's Memo

Enthusiasm. Looking back after two months in office as president, I see an entirely new look to the Academy of Model Aeronautics. It is an attractive look of Streamlining, Awareness and an Intense Speeding-Up. This may not be felt immediately at the membership level, but it is already very evident at officer and Headquarters level.

Executive Council. The AMA Executive Council, consisting of the president, eleven district vice-presidents, the secretary-treasurer and the executive director, met in an all day session on February 26th to establish the guidance for the organization during the first half of 1971. For the first time in AMA history all AMA representatives were in attendance. As president I had, by personal letter, urged the councilmen to come to the meeting with "their sleeves rolled up and enthusiastic smiles on their faces." Without exception they did exactly that. As a result we handled a very large agenda, and came away from the meeting with a firm dedication to work still harder.

Campaign Promises. I am most happy to report that the first proposition of my election campaign letter has been accomplished. AMA was sorely in need of guidelines for elected and appointed officers. Through some fine work on the part of District II Vice-President **Bill Boss** and Executive Director **John Worth**, and thoughts from the entire council, a "Guideline Book" has been established.



AMA President John Clemens

The book, about 1/2" thick, is already in use by the council members, greatly aiding the streamlining and intelligent handling of AMA's problems. Hooray for the "book"!

Back to Enthusiasm. At the Executive Council meeting, and just two days before he died, **Chuck Broadhurst**, the District X vice-president, said to me, "I'd like to put a name to your term of office and to this period in AMA's life. Let's call it 'The New Momentum!'" In Chuck's memory I hope the entire membership of AMA will help me establish The New Momentum!

John Clemens
AMA President

AMA News Bits

CL Organization Urged

AMA President **John Clemens** has suggested that Control Line flyers form an organization of common interest in similar fashion to the successful and very effective **National Miniature Pylon Racing Association**, **National Free Flight Society** and **National Indoor Model Airplane Society**. Clemens cited the disagreements attendant with the CL Contest Board's deliberations on line size requirements for various types of CL flying, in which it appeared that there were as many viewpoints as there were model flyers. He also noted the usually unified and consistent representation in AMA decision-making by NMPRA, NFFS and NIMAS. "In my opinion," Clemens said, "the answer to problems of this type can best be solved by the flyers themselves, or upon their recommendations to their chosen category leaders."

Any AMA member interested in such a national CL organization should send a letter or postcard stating so to AMA HQ, indicating also if he feels qualified and desirous of being among the organizers. There must be strong and available leadership! AMA will put all those responding in touch with one another.

RC World Championships

International response regarding attending the **RC Aerobatic World Championships** at Doylestown, Pa., **September 15-19**, was tremendous back in February when this was written. Full teams were already acknowledged to be coming from Norway, France, Finland, Sweden, Ire-

land, Netherlands, England, Denmark and Austria; at least twenty teams are expected. And it also appeared that **Operation Friendlift**, to transport teams, officials and supporters from Europe, is living up to expectations—reservations already received from 16 countries: Norway, Italy, Austria, Germany, Belgium, England, Ireland, Netherlands, Denmark, Switzerland, France, Portugal, Finland, Sweden, Scotland and Spain. The whole world is looking at this innovation with the idea of applying it to other aeromodelling (and full scale) World Championships if AMA can prove it to be successful.

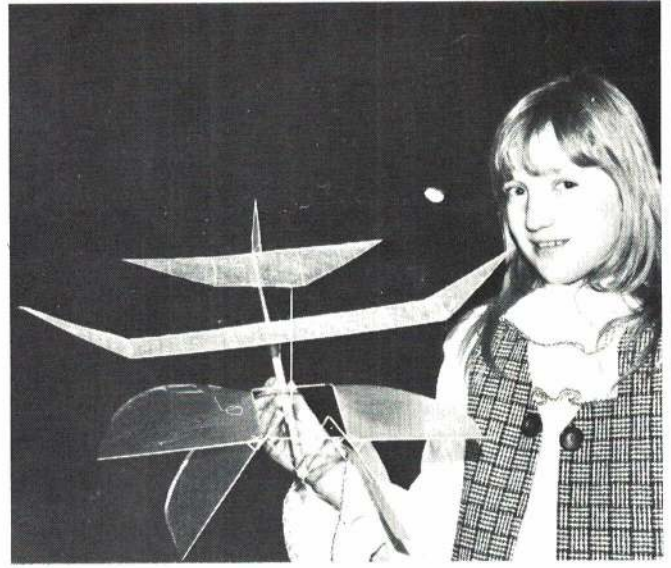
Paul Mantz Memorial Trophies



Winner of the Paul Mantz Memorial Flyer-of-the-Year Trophy for 1970 was **Bob Smith**, at left in photo above. The award is presented each year by the AMA chartered **BIRD Club** of Carson, Calif., to the member who has distin-



Off to new record of 7 minutes and 35 seconds in the Senior age class at Cleveland Record Trials is Dale Hacker's Indoor Rise-Off-Ground Stick model. Hacker held the Junior record in 1970.



Flapping and rotating wings run in the Johnson family. Susan set 30-second Ornithopter Junior record at January Trials in Cleveland where many new marks were set. Both photos by Charles Tracy.

guished himself in contests. At center is BIRD Club President Al Lowell. The Paul Mantz Junior Flyer-of-the-Year Trophy went to Chuck Hebstreit, right, who actually placed ninth in overall standings.

Runners-up for Flyer-of-the-Year were Terry Prather, Whit Stockwell, Joe Howard and Mike Barna. Like winner Bob Smith, all of the runners-up but one are 21 years of age or under. Previous winners have been Joe Bridi (three times) and John Greenshields. Previous Junior Flyer-of-the-Year award recipients were Debbie Hannon (twice) and Whit Stockwell. Thanks to Betty Stream for photo and info.

New RC Fields

A long time goal, a permanent flying site, has been achieved by the AMA chartered MARKS Club, San Bernardino, Calif. Thanks to the efforts of Chuck Beeman, the club now has a five-year lease (plus an option for five more years) from the Water Department. Two runways, taxiways and a pit area are planned, subject to city approval. The flying site comprises approximately 300 acres.

Back east the AMA chartered Tri-Cities Aeromodelers, Kingsport, Tenn., at long last have their own leased flying site with a runway 40 feet wide by 250 feet long. Various club members first shaped the runway with a road grader, spread two loads of fine rock, rolled the runway, then erected a two-strand barbed-wire fence to keep cows out. Members are to be commended for pitching in to do the work, also for making donations toward the expenses.

Akrostar Coupling Credits CL

Carrier Wave, newsletter of the AMA chartered McDonell RC Club in Missouri, recently had a report from Don Stauffer in which he told about a British magazine review of the unique Akrostar aircraft (full size) entered in the 1970 Aerobatic World Championships. "Among its unique features were coupled flaps and elevators," related Stauffer. "In the interview the designers credited the development of this control technique to model aircraft," first used on

CL Stunt models. "Another feature of the Akrostar was a coupling between flaps and ailerons. The flaps are differentially deflected when the ailerons are actuated, although to a lesser angle. The result is effectively full span ailerons." Concluding, Stauffer said, "Obviously the designers of this full scale aircraft are well up on model aircraft state of the art."

Fast-Slow RC Pylon

An interesting variation on RC Sport Pylon Racing was a part of a Fly for Fun contest put on by the AMA chartered Radio Control Club of Rochester (N.Y.). The idea, reported in the club's Airflow newsletter, was to time one full lap of the regular course at full speed, from a flying start, then to time another full lap at as slow a speed as the pilot desires, maintaining the same flight path as the fast lap. In the club's September meet, Jerry Drumheller took first place flying a Beachcomber. His fast lap of 17.8 seconds, coupled with a very slow lap of 81.8 seconds, gave a differential of 64 seconds to surpass the field by far.

Muffler Tethers

A simple method to prevent in-flight loss of a muffler which might vibrate loose is put forward by Rex Geivett in the newsletter of the AMA chartered San Jose Wavemaster RC Club (Calif.) Just attach the muffler to the engine with a safety wire (in addition to normal mounting)—requires only drilling a small hole in the body of the muffler through which a piece of wire can be passed, then securing the wire around the engine's cylinder. Could save a lot of searching time and possible loss of a good investment.

Complaint Cards

Making it easy for members of the AMA chartered DCRC Club (Washington, D.C., area) to complain is the purpose of the blue postcards provided at meetings by President Tom Carey. Obviously the intent is to give members another means of making known their desires to the president and Board of Directors—so necessary to maintain unity. With the club membership num-

bering 225 there just isn't enough time for all to be heard at a club meeting.

Where the Action Is

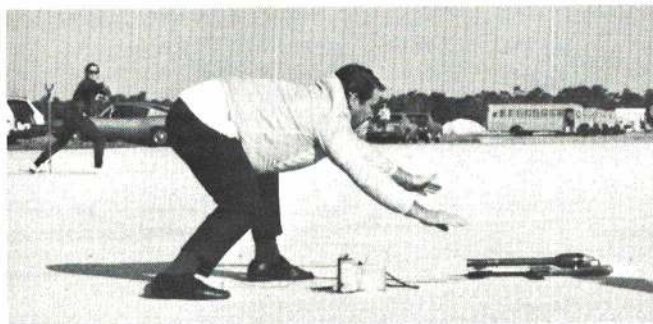
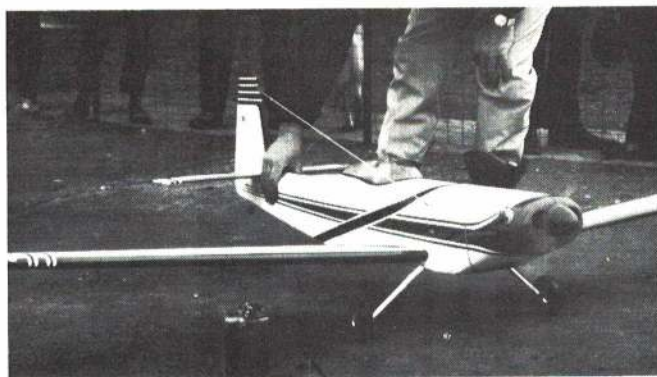
Could it be that "Where the Action Is" is with AMA? We took a look at the names of the columnists in this section of the April AAM and found, not to our surprise, that each one who deals with a model airplane subject is an AMA member, and nearly all have the AMA Contest Director rating. Three are AMA Vice-Presidents: Bill Boss, Dist. II; Chuck Broadhurst, Dist. X; Bob Stalick, Dist. XI. Three are AMA Associate Vice-Presidents: John Blum, Dist. VI; Bud Tenny, Dist. VIII; Bob Meuser, Dist. X. Claude McCullough is AMA Scale Contest Board Chairman, and Howard McEntee is a member of the AMA RC Frequency Committee. We don't think you will find a greater powerhouse of AMA officials anywhere.

Down In Laos

"I'm the only man in the Air Force who's had three of his own aircraft go down in Laos," SSgt. Edward T. Geiger (AMA 8301) was quoted in the Air Force Times. During his duty tour in Thailand Sgt. Geiger has managed to build a number of Free Flight models which he has flown from the town of Makhom Phanom on the Mekong River a short distance from his base. On three occasions a deceptive light ground wind switched direction at altitude, carrying the models across the river. "The last I saw," he said, "they were heading east over the Laotian border town of Thaktek."

FCC Club License

Amidst all the fuss about the increase in the cost of a Citizen's Band FCC license to \$20 from the previous \$8, there developed a happy situation for AMA clubs. This was the availability of club licenses as a substitute for individual licenses. This can be an excellent selling point for a modeler to join or stay in a club as evidenced by commentary in a number of club newsletters. The AMA chartered Tri-Cities Aeromodelers, Kingsport, Tenn., having obtained the club FCC license, points out to members (and potential joiners) that "the new FCC fee



Upper Left: Second place in Scale at the Long Island Assn. of MAC's Fall Indoor Meet was taken by Bruce Paillet's Pilatus Turbo-Porter built from enlarged Hannan plans. The association's next Indoor Meet is on May 2—see Contest Calendar. Jean Paillet photo. Left: Jet Speed model off for 10.9-second half mile at 17th King Orange Internationals at Jacksonville in January. Bob Day launches for Butch Andrews. Glenn Payne won Jet event. Mark Day photo. Above: Spinks Akro Master RC Scale Stunt model built by Aero Telemechanics President Bob Walker, West Chester, Ill., designed and photographed by Jack Burns—inspired by Feb. 1970 AAM article on the Spinks. Model is 1/5th full size, 72" span.

of \$20/5 years is almost equal to club dues," and that members get use of the club license at no extra charge. AMA clubs were sent details on obtaining club licenses last October.

1971 Rule Book

Rule books for 1971 should be in the hands of AMA members who joined or renewed earlier in the year. A mass bulk mailing of the books was made on March 10.

One difference members will notice this year as compared with the 1970 book is that a small dot has been placed adjacent to the beginning of a section or paragraph if that part of the book is either new or revised for 1971. It's an effort to make it easier for renewal members to follow what changes have been made to the rules. But despite using care in applying the dots, the system of placement is not infallible—members are cautioned to read chapters of interest in their entirety.

Membership Manual

Another difference in the 1971 rule book is the removal of most items not concerning competition rules—still the book is a big 80 pages. AMA members will receive the material which was omitted (insurance information, organizational procedures, etc.), plus much more information, in a separate **Membership Manual** being produced. It will include details of the AMA organizational structure, how to reach the person who can help with your problem, how to get your ideas considered for action. This manual will be a first attempt to spell out how AMA operates and who is responsible for what. It should be a great step forward in helping everyone understand how their national association functions, with the aim of encouraging more effective inputs from members and officers. The manual is a long needed item for better internal communications and PR, to help all of us understand how to get the most out of our organization.

Fox Valley Award

For the season just passed the **AMA chartered Rockford Aeromodelers** attained the highest point total among the

six Control Line clubs in northern Illinois affiliated with the **Fox Valley Model Aircraft Association**. Photo by **Wayne Morrison** shows FVMAA President **Howard Westerman**, left, presenting the High Point Trophy to the Rockford club, represented by **V. P. Art Johnson**.



Each FVMAA club holds at least one contest each year. On alternate years, the contests are restricted to FVMAA members. Points are awarded to each club according to amount of representation at contests as well as for placing in the events.

FAI RC Scale

According to a report in the **Scram Bulletin** of the **South Carolina Radio Aircraft Modelers**, this year's contest of the **AMA chartered Western Carolina RC Club** will have its RC Scale event run by FAI rules instead of AMA rules. In reality, of course, the rules established by the Federation Aeronatique Internationale are just as much "official AMA" as the rules established by AMA's own Contest Boards. Reasons stated by **Skip Williams** for going FAI are that, by these rules, each plane will have the same number of options for flight score, thereby providing the same possible maximum score for all entries; and that use of these rules may be of eventual assistance to U.S. RC Scale World Championship team members.

Many Talents—Yes

"A modeler must be a person of many talents," supposed **Glenn Schautz** when he related some of his feelings about getting his son started in Free Flight modeling. This was in the newsletter of the **AMA chartered Lansing Flying Aces** (Mich.). "Techniques you and I take for granted have to be learned fresh by a young guy—simple things like holding a knife so it cuts straight up and down, or cutting with a razor saw so that it doesn't cut too deep when notching ribs, etc.," he said. "A person doesn't realize the amount of technique he has developed in modeling until he starts a new, young modeler."

FF Records Ratio

Excellent results were obtained from the experiment with the record ratio system for the 1971 **AMA sanctioned Strat-O-Bats Misery Meet** at Ft. Lewis, Wash., in February, reports Contest Director **Bud Nelson**. He related that it provided the sought-after balance between model classes such as **FAI Power vs AMA Gas** and **A-1 Glider vs A-2 Glider**. "It also produced a definite handicap for Open flyers competing against Juniors and Seniors," he said. Four events were run by the ratio system: **FF Gas, Towline Glider, Rubber and HL Glider**. The only other event was **Old Timer Gas**, run by time target rules. Interestingly, Senior age AMA flyers produced the highest record ratios in each of the four events run in this manner.

Frequency Survey

The RC Frequency Survey conducted last fall by **Robert Aberle** of the **AMA chartered Long Island RC Society** pointed up the interesting fact that, in his club at the time, several of the 27 MHz channels were practically unused. All the 72 MHz channels had fairly heavy usage, except for 75.64, known to be a problem channel in the area. The low usage channels were 26.995, 27.095 and 27.195. Of the club's 53 members, 43 responded to the survey questionnaire.

The survey also hammered home the fact that very few club members are licensed to use six meter equipment,

pointing up the need for the club to train its members in Amateur Radio theory and code. The initial goal is for a number of club members to obtain their Technician Class License.

Help for Navajos

Among groups which have positively responded to an appeal to help impoverished young Navajo Indians in Arizona get started in model airplanes is the **AMA chartered Aero Telemechanics RC Club** in Riverside, Ill., plus other clubs in the **Chicagoland RC Association**. **Art Brown**, a teacher of the Indian boys at Many Farms Elementary School, Chinle, Ariz. 86503, previously explained that a small sampling of modeling had created a tremendous amount of interest among his group, but the school did not have money for supplies nor did the boys. Principally he was seeking discarded out-of-date kits, tools, engines, etc.

The association responded by sending over 40 pounds of modeling goods, including some older radio equipment, but sending inflammables such as fuel and dope was a problem. Telemechanic member **Bill Harlander** decided to do a good deed by constructing RC model skis to be sold among club members—proceeds to be donated to Art Brown for purchase of fuel and dope. According to club Secretary **Jack Burns**, \$21.50 was raised by this means.

Any RC'ers nearby to Chinle? Burns says that Art Brown isn't up on RC; maybe someone could stop by and help Art put all of this equipment to work.

Idaho CL Field Reinstated

The Control Line flying field provided by the City of Pocatello in 1955 was put to other use when the model club then in existence folded and the area was not sufficiently used by flyers. With the resurgence of the **Pocatello Glue Angels** the

city was persuaded to reopen and refurbish the area. According to a report in the club's **Balsa Sheet** newsletter by Senior Advisor **Al Culver**, **Mr. Knapp** of the City Parks and Recreation Department is to be particularly thanked.

Culver cautions the club that responsibility by each member is necessary if the facility is to continue being made available, particularly with respect to demonstrated need and use. It must be shown, he says, that city taxes are well spent. Among other things this means making maximum use by flying there at all times (instead of at possibly a nearer school yard), holding more contests, and always keeping the area neat and clean.

No More Lonesome Strangers

That's the purpose of a simple but ingenious plan announced by **Rodney Taylor**, president of the **AMA chartered San Fernando Valley RC Flyers** (Calif.). Here's how it works. At each monthly club meeting, one club member (different each month) will be appointed the "Lonesome Stranger". During the meeting, he will be called upon to identify himself, and he will also identify the fifth person who voluntarily shook his hand. If that fifth person can tell something about the Lonesome Stranger, such as his latest project, he will win a prize.

In this manner all members are encouraged to get acquainted with one another and to develop interest in each other's activities. "Start shaking hands and getting acquainted," said Taylor. "You may shake the hand of the Lonesome Stranger."

Watch the Altitude

Al L'Heureux's Supertigre 23-powered Flea-Fli Plus 10 is said to have plenty of power and speed at sea level when he is at home flying with fellow members of the **AMA chartered Southern**

Alameda County Radio Controllers (Calif.). But according to his report in the club's newsletter, he had all kinds of trouble when he flew the model from an airport in Lake County at about 3,000-foot altitude. Controls appeared to be mushy and slow acting, rolls were slow and difficult. Even a turn with ailerons and elevator was a most difficult maneuver. And the elevator proved to be nearly ineffective on the landing approach. In conclusion, L'Heureux says to beware of high altitudes and small wings. Reminds us of 1970 Nats entrant **James Wilmot**, from Denver, who had just the opposite problem. He installed soda straw spoilers at the wing root in an effort to kill excess lift.

Good Publicity

Did you know that company magazines and newsletters are anxious to report about wholesome activities of their employees? Obviously such reporting adds tremendously to the prestige of the activity. An excellent example of this is the December issue of **Men & Steel**, an employee magazine of the **Jones & Laughlin Steel Corporation**. The story titled "The Planes with the Grounded Pilots" was an outstanding four-page presentation, with many photographs, of the appeal and activity of RC model flying. Particularly featured were the **AMA chartered Greater Pittsburgh Aero Radio Control Society**, the new **Hillman Model Air Park**, and **ARCS** members who are **J & L** employees.

When your club seeks increased publicity, don't overlook contacting the people who put out the employee publications.

New NCRCS Chairman

Jim Sunday, a member of the **AMA chartered Pioneer RC Club**, was elected
Turn to page 62



Above left: Tom Dodgen, from Winsboro, Tex., flies an original design with modified New Orleans wing in Class B RC Pattern after "graduating" from Class A a year ago—Veco 61 engine, Orbit radio. Carl Summers photo. Above right: Dan Lutz, usually identified with RC Scale, still has FF interest. Rubber-powered Rearwin Speedster shown. Bill Hannan photo.



No other word but "huge" describes the trophy provided by the **Kyosho Corp.** for the high-point winner of the upcoming **West Coast Free Flight Championships**. It's 6-ft. tall!



Left: Manning the **AMA** booth at the **Toledo RC Conference** were (L-R) **Frank Ehling**, technical director, **Earl Denny**, office manager, and **Danny Harrah**, membership clerk. All were kept busy collecting dues and answering members' questions. Photograph by **Bill Boss**.

AMA News Extra

1973 FAI FREE FLIGHT TEAM SELECTION PROGRAM

According to AMA FF Team Program Administrator Dave Linstrum, the Qualifying Trials of the 1971-72 program, for selecting 1973 World Championship Free Flight Teams, will be identical with the Qualifying Trials of the previous FF program. However, word from the Team Selection Committee is that members are still sorting through the many proposals for changing the concept of the Semi-Finals and Team Finals, although the idea of financial assistance, from program entry fees, for travel of Semi-Finalists to a single country-wide Team Finals is in strong contention. It is thought that providing such assistance might alleviate the necessity for holding the Team Finals in a central U.S. location and also encourage more modelers to participate. Hopefully, Semi-Final and Team Final details can be announced next month. In the meanwhile, the following information is provided for registration and flying in the Qualifying Trials stage of the program; qualifying flights must be accomplished between April 4 and August 1, 1971.

Purpose. The program will select, through competition, 1973 FAI FF World Championship Teams consisting of three men each for Wakefield Rubber, FAI Power and Nordic A-2 Glider. The location of the 1973 FF World Championships has not yet been established.

Program Entry. Entry in the Qualifying Trials stage of the program is made in one of two ways:

1. In advance (preferable), by Senior and Open AMA members sending to AMA HQ (806 Fifteenth St., N.W., Washington, D.C. 20005) a program fee of \$4.00 for each event concerned. Entry is free for Junior members (but they must request entry from AMA HQ, and include a stamped, self-addressed return envelope). All program entry fees (and entry requests by Juniors) must be accompanied by the flyer's name, address, AMA number and type of event to be flown (specify Wake, Power and Nordic).

2. At an AMA Sanctioned FAI FF Qualifying Trial, by Senior and Open AMA members paying to the Contest Director a late program fee of \$5.00 for each event. There is no late fee for Juniors.

Eligibility. The program is open to any AMA member who has the current FAI stamp (obtainable from AMA HQ for \$1 if purchased when dues are paid, \$1.25 if purchased later). Program entry fees (see above) must be paid prior to flying; initial Qualifying Trials entry fee (either in advance to AMA HQ or on-site at an AMA Sanctioned FAI FF Qualifying Trials) entitles flyer to unlimited attempts at qualification.

How to Qualify. Qualification for the next competition stage of the program (the Semi-Final stage if previous nomenclature is retained) may be done at either a regularly scheduled AMA FF meet with FAI events or at an AMA Sanctioned FAI FF Qualifying Trials (see Contest Calendar for dates, locations). Note that qualifying at a regularly scheduled AMA meet requires advance program entry by mail to AMA HQ as on-site entry is not available; also, permission must be obtained in advance from the meet CD to fly seven flights. Qualifying and late program entry as per method number 2 will be permitted at the National Contest at Glenview N.A.S. Qualifying must be done between April 4 and August 1, 1971.

Qualifying Criteria. Qualifying performance needed to advance to the next stage of the program is a 7-flight (or less) total of 14 minutes or better, with model specifications and timing in accordance with FAI rules. When a flyer succeeds in qualifying, the meet Contest Director will certify to this by signing the flyer's Qualification Performance Affidavit. Affidavit forms are provided to the program entrant by AMA HQ when entry is in advance as per method number 1 or by the meet CD when entry is at a Qualifying Trials as per 2. Once qualified, the flyer (not the CD) will mail one copy of the Affidavit to the Program Administrator, one copy to AMA HQ, and keep the other as his receipt.

Rules. Model and flying specifications are in the 1971 AMA rule book, pages 62-66. The Qualifying Trials are run by the full seven flights provided by World Championship rules (not by the 3- or 5-flight option provided for AMA events). The flyoff procedure for FAI Power is new this year, calling for a reduction in engine run rather than (as previous) an increase in max time. Voucher processing will be used for Qualifying Trials; forms may be obtained with program entry, or vouchers from previous programs may be used. Vouchers are a convenience to meet CD's, not a guarantee that model meets the required specifications.

DISTRICT X VICE-PRESIDENT

Through a long distance telephone vote conducted by AMA President John Clemens, the AMA Executive Council has unanimously decided to appoint Alex Chisolm (1589 W. Celeste, Fresno, Calif. 93705) to fill the vacancy in the council left by the passing of District X Vice-President Chuck Broadhurst. Chisolm was runner-up to Broadhurst in the past election, and was already serving as associate vice-president for District X. His term in office will run through 1972.

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.

1971 chairman of the Northern California RC Society at a meeting and fly-in at Madera Airport. According to a report in *The Modulator* there were club representatives on hand from both Northern and Southern California to work out 1971 contest dates. One of the big ones, the West Coast RC Championships, is planned for September 4-5 under sponsorships of the Peninsula Channel Commanders and support of the San Jose Wavemasters, Fresno Radio Modelers and the Pioneers.

Cuban National Meet

With the present state of affairs we had no real knowledge of whether aeromodelling in Cuba is still flourishing as it was many years previous when teams were always present at the big Florida meets. We've still no way to judge the extent of the activity, but we now know that it is still very much alive with receipt of a program for the National Contest at Camaguey last December 3-9. The contest had an impressive array of events, although no RC events were scheduled. In Control Line there were Speed (two classes), Aerobatics, Combat (two classes), Team Racing and

Scale. In Free Flight there were A-2 Towline, Wakefield Rubber and FAI Power. The contest was not organized solely for modeling—held in conjunction were events for parachuting and full size soaring.

Photos Wanted

Most of the pictures printed in the "AMA News" section are contributions from AMA members. If you haven't seen photos of your kind of interest, likely none have been submitted. Do something about it—send in some pictures of your own.

All types are wanted: RC, CL, FF, Scale, Indoor, construction, gimmicks, sport flying or contests. All sizes of prints are useful, black-and-white or color, including Polaroid.

Submit only prints which need not be returned, and on the back of each (or in an accompanying note) print descriptive information about the models and modelers shown, also the name of the photographer. No payment possible, but full credit will be given for photographs used. Send to Publications Director, AMA Headquarters, 806 15th St., N.W., Washington, D.C. 20005.

CONTEST CALENDAR

Official Sanctioned Contest of the Academy of Model Aeronautics

May 1-2—Taft, Calif. (AA) SHOC Annual FF Meet. Site: Taft, J. Tischler CD, 1306 Kings Ct. Dr., Anaheim, Calif. 92804. Sponsor: Sky Hoppers of Orange County.

May 1-2—Arlington, Tex. (AA) Mother's Day FF Annual. Site: So. Arlington, M. Fedor CD, 1926 Balla Way, Grand Prairie, Tex. 75050. Sponsor: Cliff Cloud Climbers of Dallas.

May 1-2—Greensboro, N.C. (AA) 2nd Annual Greensboro RC Meet. Site: Greensboro, B.L. Johnson CD, 4139 Sheridan Rd., Greensboro, N.C. 27405. Sponsor: Greensboro Radio Modelers Club.

May 1-2—Dallas, Tex. (AA) 6th Annual Dallas RC Contest. Site: Samuels East Park, T. Brown CD, 930 Vinecrest, Richardson, Tex. 75080. Sponsor: Dallas RC Club.

May 2—Washington Crossing, N.J. (B) Del. Valley Fed. of M.A.C. FF Bash I. Site: Washington Crossing State Park, T. Kerr CD, 7824 Lexington Ave., Philadelphia, Penn. 19152. Sponsor: Philadelphia Sky Pirates.

May 2—Lakehurst, N.J. (A) MMAC Pattern FF Contest. Site: Lakehurst N.A.S. R. Roane CD, 311 Beers St., Keyport, N.J. 07735. Sponsor: Monmouth Model Airplane Club.

May 2—Shawnee, Kans. Shawnee Mission Glider Meet. Site: Shawnee Mission Park, B. Drummond CD, 8115 Charlotte, Kansas City, Mo. 64131. Sponsor: Shawnee Mission RC.

May 2—Hicksville, L.I., N.Y. (AA) L.I.M.A.C. Indoor Championships-Cat. II. Site: Cantigue Park, J. Pallet CD, 30 Emerson Rd., Brookville, Glen Head, N.Y. 11545.

May 2—Tucson, Ariz. (AA) CCMAC Spring Invitational CL Meet. Site: Rodeo Park, T. Snow CD, 3408 N. 2nd Ave., Tucson, Ariz. 85705.

May 2—Hadley, Mass. Hampshire Showdown RC Air Races. Site: H.C.R.C. Flying Field, F. Mitchell CD, 290 Notre Dame St., Westfield, Mass. 01805. Sponsor: Hampshire County RC'ers.

May 2—Wichita, Kans. (AA) 4th Annual Wichitahawks Spring FF & CL Rally. Site: 13th & Webb Road, M. Tallman CD, 3014 Exchange, Wichita, Kans. 67217. Sponsor: Wichitahawks.

May 2—Council Bluffs, Iowa (AA) Midwestern Spring CL Warm-Up. Site: Iowa School for Deaf, D. Hutcheson CD, 317 Spencer Ave., Council Bluffs, Iowa 51501. Sponsor: Balsa Busters.

May 8-9—Winters, Calif. (AA) West Coast Invitational RC Meet. Site: Yolo County Airport, J. Graham CD, 606 Whitehall Cir., Fairfield, Calif. 94533. Sponsor: Yaca Valley Radio Controllers.

May 8-9—Baton Rouge, La. (AA) Baton Rouge RC 10th Annual RC Contest. Site: Club Field, Pecue Lane, H. Robert CD, 9243 Hampton Way, Baton Rouge, La. 70814.

May 8-9—Huntsville, Ala. (AA) 11th Annual Rocket City RC Meet. Site: Old Huntsville Airport, C. Scholefield CD, 2709 Briarwood Dr., S.E., Huntsville, Ala. 35801. Sponsor: Rocket City RC Club.

May 9—Van Nuys, Calif. (AA) Valley Circle Burners FAI CL Meet. Site: L.A. Model Airport, W. Netzeband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

May 9—Fort Worth, Tex. Fort Worth Thunderbirds RC Pylon Races. Site: T-Bird Field, J. Simpson CD, 5709 Wharton, Ft. Worth, Tex. 76133.

May 15-16—Jackson, Miss. (AA) Mississippi Model Airplane RC Championships. Site: Capitol City RC Field, J. McLellan CD, 12 Woodlawn, Yazoo City, Miss. 39194.

May 15-16—Jacksonville, Fla. (AAA) Rebel FF, CL & RC Rally 1971. Site: Imeson Airport, F. Carney CD, 1839 Loyola Dr., Jacksonville, Fla. 32218.

May 15-16—Pasadena, Tex. (AA) Third Annual Gulf Coast CL Championships. Site: Pasadena, R. Davis CD, 1305 Camden, Pasadena, Tex. 77502. Sponsor: Pasadena Model Airplane Pilots Assn.

May 16—Curles Neck, Va. (AA) Annual Spring FF Meet. Site: Curles Neck, D. Orr CD, 102 Bickford Dr., Hampton, Va. 23366. Sponsor: Brainbusters FF Model Club.

May 16—Downers Grove, Ill. (AA) 5th Annual AA CL Meet. Site: 39th & Fairview Park, R. Phillips CD, 4431 Stonewall Ave., Downers Grove, Ill. 60515. Sponsor: Treetown Modelairs.

May 16—W. Suffield, Conn. (AA) Nor-East RC Air Races '71. Site: NCRCC Field, A. Simmonds CD, 145 Irene Dr., RFD #4, Vernon, Conn. 06086. Sponsor: Northern Connecticut Radio Control Club.

May 16—Monmouth County, N.J. (A) 3rd Annual RC Soaring Meet. Site: To be announced, R. Sarpolus, CD, 32 Alameda Ct., Shrewsbury, N.J. 07701. Sponsor: Monmouth Model Airplane Club.

May 16—Portland, Ind. (AA) SWOFF Spring FF Fly-In. Site: Portland, R. Kluber CD, 2021 Lakeland Ave., Lakewood, Ohio 44107. Sponsor: Southwestern Ohio Free Flyers.

May 16—Valley Park, Mo. Signal Chasers Fly for Fun. Site: Buder Park, R. Underwood CD, 1409 Concord Oaks Dr., St. Louis, Mo. 63128. Sponsor: Signal Chasers Radio Control Club.

May 16—El Segundo, Calif. Northrops "RC Fun Scale" Meet. Site: Calif. E. L'Homme CD, 5006 W. 129th St., Hawthorne, Calif. 90250.

May 22-23—Hampton, Va. (AA) 7th Annual Southeastern Va. RC Meet. Site: Club Field, D. Holmes CD, P.O. Box 814, Grafton, Va. 23490. Sponsor: Southeastern Va. Radio Control Group.

May 22-23—Riverdale, Ill. 1971 Season RC Opener.

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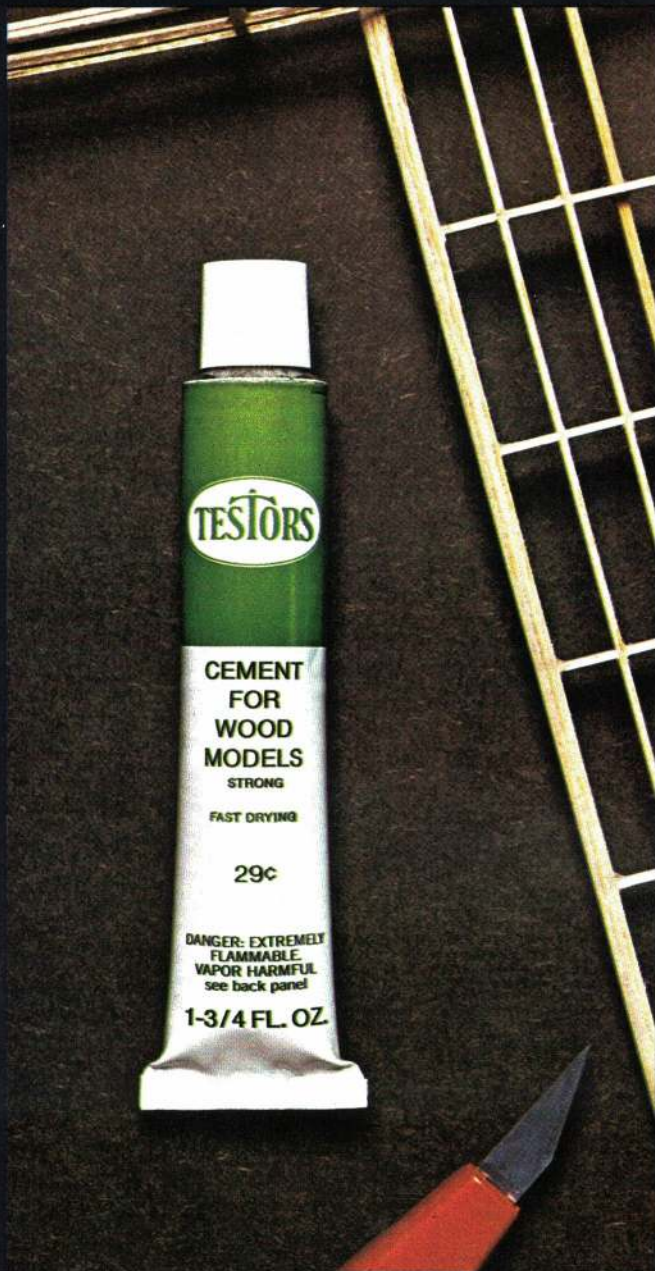


A highlight of the Annual Awards Nite and Spaghetti Dinner of the Greater Pittsburgh Aero Radio Control Society last January was the presentation of the Outstanding Achievement Award, above, to club member K. LeRoy Irvis (right), Majority Leader of the Pa. State House of Representatives. ARCS Secretary Alex dePouilloff made the presentation. Among those at the head table, below L-R, were AMA Executive Director John Worth, AMA President John Clemens and outgoing ARCS President (also AMA Associate VP) Ralph Pennetti. Clemens went to Pittsburgh after his first visit to AMA HQ following installation as president. Clyde Stacy photos.



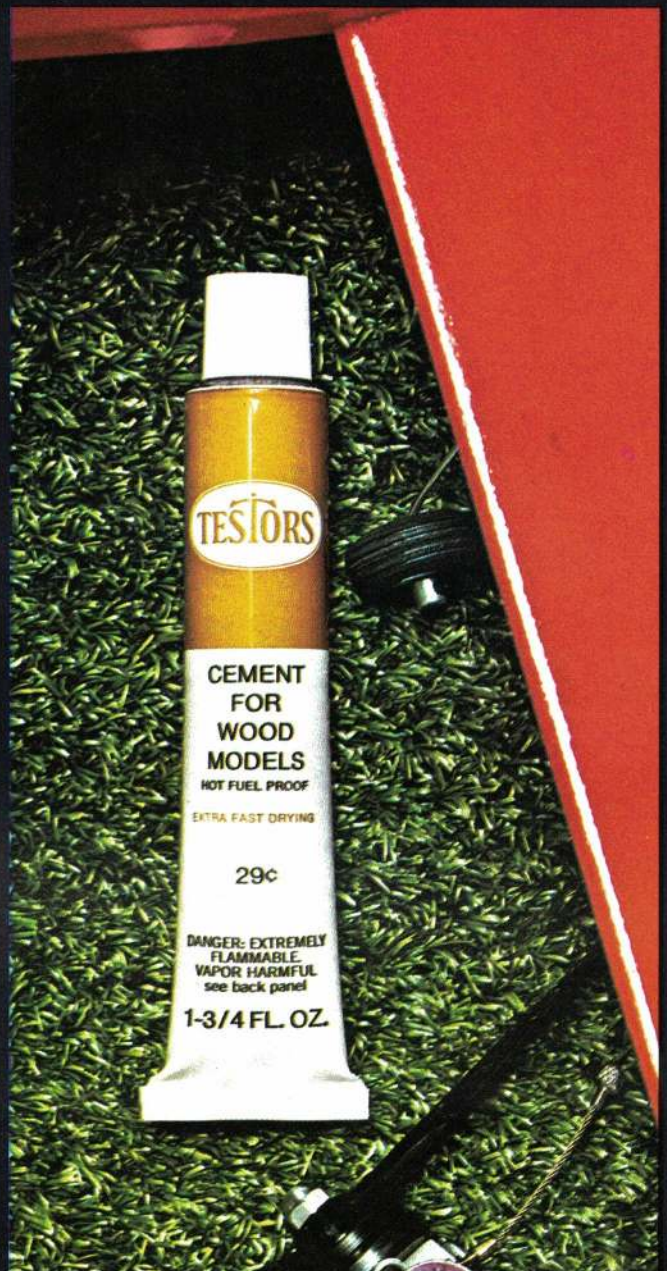
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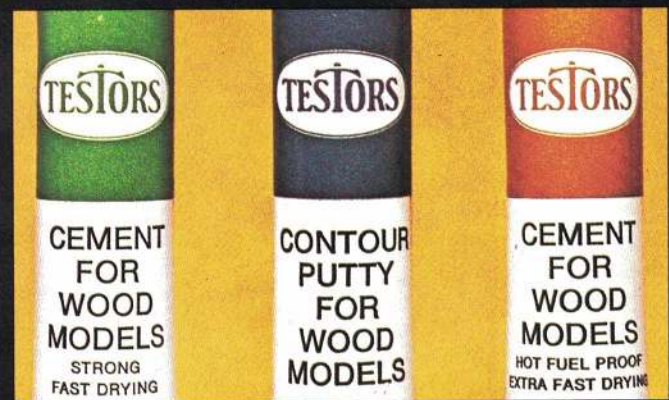
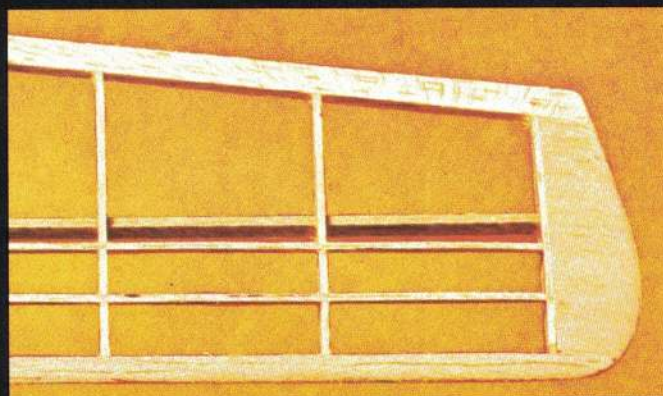
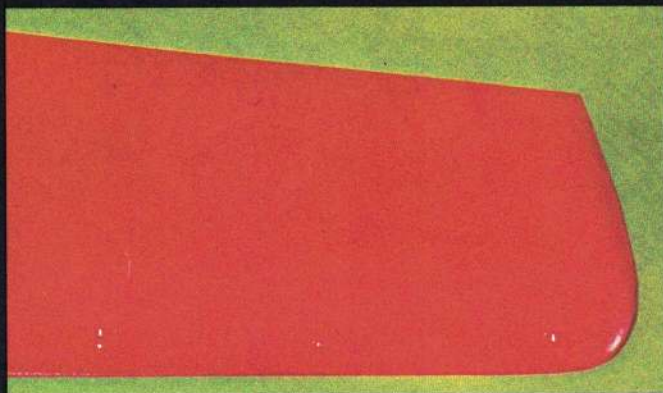
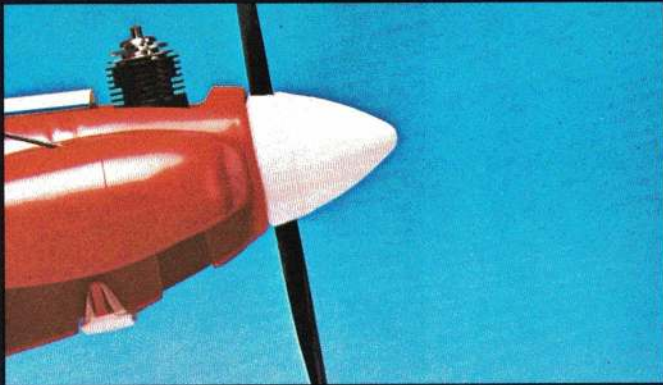
3 sizes, $\frac{5}{8}$, $1\frac{3}{4}$ and 4 oz. tubes; the Field Hand in 2 sizes, $\frac{5}{8}$ and $1\frac{3}{4}$ oz. tubes. Remember, Testors has been keeping championship models together on the bench and on the field for over 40 years. If you're an old pro, you know. If you're new on the scene, ask an old pro, or your hobby/model dealer.

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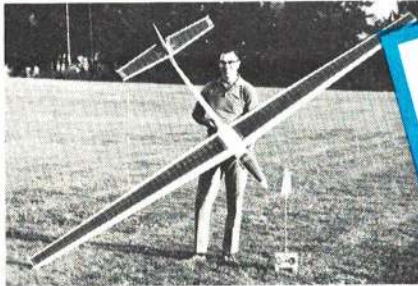


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MONOKOTE GETS LETTERS... LOTS AND LOTS OF LETTERS!

“I’ve never taken the opportunity to thank a manufacturer before, but I do want to express my opinion on your Super Monokote. I’ve just covered five new wings and stabs with it, and it is great!

Chuck Broadhurst
Sacramento, Calif.



The ship came in 250 ft. straight down in a radio failure and there was only a small tear on the underside of one panel.

Harley E. Michaelis
Walla Walla, Wash.

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Daniel Rossman
Wynnewood, Pa.

I have not “silked” a model since Monokote became available. First Monokote job was regular silver on an Antic, since then have covered 14 models of my own. 3 Bikes, 1 Tripe & 4 Kwik Fli were included in this total.

Don Johnson
Denver, Colorado

I’ve been showing it to everyone I know demonstrating how hard it is to damage and the ease with which it can be repaired. Believe me it’s all the ad says and more.

Winston Hockenberry
Waterbury Center, Vt.

I have found that Super Monokote works easier than any other covering that I have ever used. Super Monokote surprised me at how smoothly it covers curved areas like wing tips.

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MONOKOTE IS THE GREATEST!! I’ve experimented with most of “them” and always go back to Monokote.

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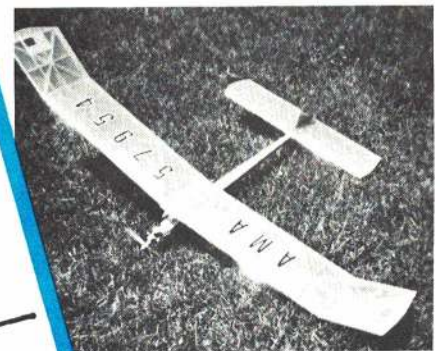


Even Naomi, my wife, loves Monokote because it is odorless, and also I have been able to stop getting paint all over my clothes. I am sold on this item and intend to trade in all of my paint brushes for a new “iron.”

Donald Rothbaum
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Marc Hoit
Michigan City, Ind.



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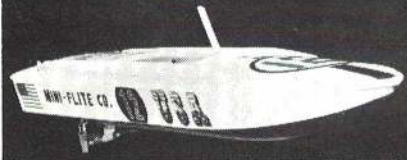
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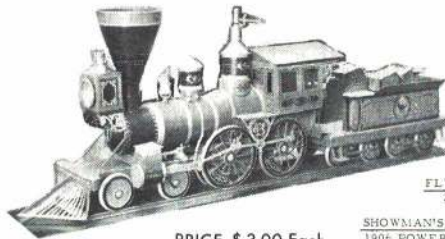
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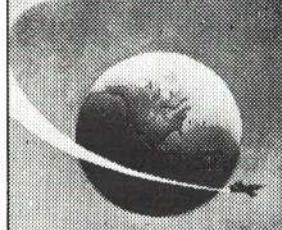
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Gambling for Peanuts

(continued from page 12)

neatly circumvented this problem. Any aircraft which, in the opinion of the judges, did not meet certain minimum standards, was automatically shifted into a separate Curtiss Robin class. This solution was so effective that a number of entrants voluntarily placed their models in that category. What hadn't been anticipated, however, was that certain individuals would stoop so low as to enter Sleek Streaks as Curtiss Robins!

The speed event nearly turned into a riot. Timing was for ten laps—which some of the models could not even complete, let alone fly at high speed. Then some of the Curtiss Robins were slightly reduced in span by wing-clipping. Launch techniques were improved as one thing led to another in the quest for more speed. Wings were finally reduced to the point where they could no longer cope with the propeller reaction, and the models simply rolled up the string, much to the chagrin of the next-in-line contestant, who had to wait with a fully wound motor, while the tether was unsnarled. Remarkably few models were damaged, particularly considering the cramped quarters literally filled with humans trying desperately to stay outside the flight circle and yet not sit on the model aircraft which were everywhere.

Conviviality and levity were the order of the day. Bob Haight "hexed" various models by placing the dreaded Black Peanut on them. Ken Hannan showed his disdain for witchcraft by simply placing the Peanut in the front

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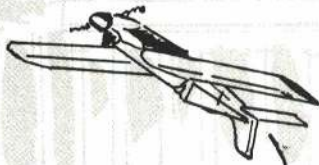


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cockpit of his Miles M. 18 and then flew it in a perfectly stable fashion. Peanut Payload anyone?

The Women's Lib movement received convincing support from Doris Haight, who placed second overall with her Waterman Racer, while Sherri Matson's Demoiselle took top honors in the Junior division.

This meet had the largest and most varied assortment of Peanuts ever gathered in one location. The event now has official AMA status and one of its main advantages seems to be the interesting (and unlikely!) subjects which can be constructed at low cost and in a short time. The Las Vegas meet included almost every known type of aircraft including sportplanes, homebuilts, fighters, seaplanes, and racers. Models ranged from pioneer types such as the Taube, Eastborne, and Rex Racer; WW I machines such as the DH-6 and B.E. 2; Golden-Agers such as the Bellanca Air Bus and Ryan M-1; WW II entries such as the Me-109 and FW Stosser, clear through the more modern Citabria, Volksplane and Akromaster.

Several experimental aircraft were on hand. Some featured carved foam fuselages (leftover RC wing cores). Of special interest was the electric free flight model powered by a motor from the new Mattel Sizzler toy car. Problems remain, but it looks to be a promising area to explore.

This contest served as a first-rate reminder that perhaps many of us take the hobby a bit too seriously and that, regardless of our particular interests, the real winners are those who have the most fun and the best memories.

Results (major events only) were as follows: Open class winners—(1) Bob Mickelsen, Parasol Taube; (2) Doris Haight, Waterman Racer; (3) Bill Hannan, Volksplane; and (4) Chuck West, B.E. 2. Junior class winners—(1) Sherri Matson, Demoiselle; (2) Ken Hannan, Miles M. 18; and (3) Jim Warner, Eastborne Monoplane. Curtiss Robin class—(1) Bill Warner, modified Sleek Streek; (2) Jim Warner, modified Sleek Streek; (3) Bob Mickelsen, Westland Fighter; and (4) Bill Hannan, Hannantique. Edselian award went to Bill Stroman.

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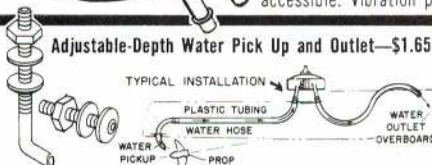
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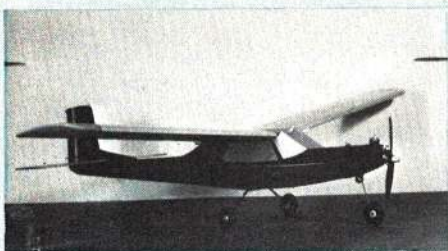
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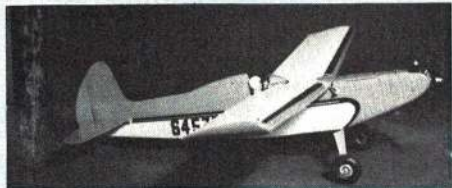
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Dear Friend:

The modeler above ought to be familiar to everyone who has been around model building for any length of time. He is George Aldrich, control line champ of many years, designer of planes for Top Flite, author of how to build articles for the model magazines, and now full time engine "Hotter—Upper" and hobby dealer- and R/C flyer.

George told us recently that he still enjoyed flying Rudder Only Pulse immensely although he is also accomplished on full house. As a matter of fact, he says, he taught a prominent Texan—who was reluctant to try his digital system—how to fly, using George's R/O ship. In the photo, George is holding a Dick's Dream.

Another extremely well-known modeler, Larry Leonard, told us he was having a ball with small ships, and that Rudder Only had been largely responsible.

If well known modelers, like George Aldrich and Larry Leonard, are having such a ball with just plain Pulse Rudder-Only—how about you? They are perfectly willing to help dignify the sport of Pulse R/O by allowing us to quote them and use their photographs. We believe this adds stature to Pulse R/O. Not only is it best for the beginner, but definitely it is fun for the experienced flyer.

Many of you asked about the foam wing glider that we pictured in this column recently. So many of you made inquiries, in fact, that we worked out something with the designer, Owen Kampen, which should be most welcome news.

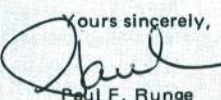
This glider is called the Ace-High. It uses one of our constant chord wing foam wing panels, and one of our taper sections to make a 64-70" polyhedral wing.

Walt Good and Maynard Hill were among those who saw it at Toledo, and suggested we move on kitting it as quickly as possible. Both said wing building was the biggest stumbling block to beginners' success in glider building. Both felt the Ace-High should provide a real solution.

We will be introducing a kit of the Ace-High. Watch this ad next month.

The Ace-High is a power pod job which, on a Golden Bee, goes up like a home-sick angel—then floats, and floats, and floats. Designed for Commander R/O Standard pulse.

Keep 'em pulsing!

Yours sincerely,

Paul F. Runge



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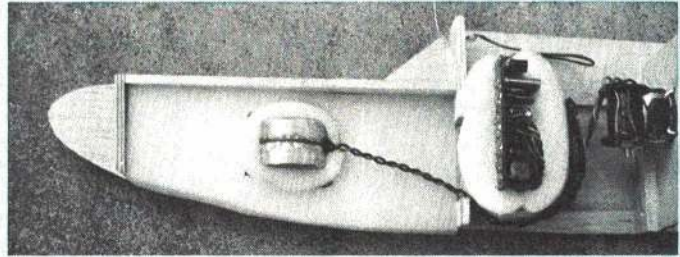
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Crusader

(continued from page 16)

leadouts are installed, assemble the wing. Using the foam packing blocks as a jig, set up the wing halves so that the center joint is aligned perfectly. Remove the wing halves from the jig, and let cure overnight. The center joint then is wrapped with fiberglass tape and epoxy and again left to cure overnight.

At this point, add the wing tip blocks which are made by tack gluing two 1 x 3 x 10" soft balsa blocks together. Tack glue the assembly to the wing and carve the tips to shape. Next, remove and hollow out the carved tips. Add a 3/4-oz. weight to the outboard tip and mount both tips permanently. Make flaps from 1/4" balsa

sheet, add hinges and control horns and install on the wing.

Tail Surfaces: Butt join as many pieces of 1/4" sheet balsa as needed for the fin and rudder and cut them out. Sand in the airfoil shape. Cut out the rudder and reglue it with the offset shown on the plan. The stabilizer and elevators are made from 3/8 x 3" sheet. Cut all the pieces to shape and tack glue them together. Using a sanding block, sand a taper from 3/8" at stabilizer root to 3/16" at the stabilizer and elevator tips. Next, sand in the airfoil shape shown on the plans. When all shaping is done, separate the elevator from the stabilizer and round off the elevator-stabilizer joint. Add the control horn and hinges to complete the assembly.

Final Assembly: Use epoxy to attach the wing in the fuselage cutout already provided.

The wing must be square to the fuselage. While this is curing, bend the elevator pushrod to shape from 3/32" dia. music wire.

When the wing is permanently affixed to the fuselage, make the appropriate cutout in the fuselage to accept the stabilizer-elevator assembly (cut former F-5 at dotted lines). Attach the pushrod to the flap and control horns. Slide the stabilizer back and forth to get a zero-zero indication on flaps and elevator. Then glue in place. The remainder of the fuselage cutout is filled in. Replace part of former F-5 and cement the tail block in place.

Hollow out the engine cowl and cut in all necessary holes. Add cowl fasteners of your choice.

I used a jack for engine starting, since it provides a neat appearance, is convenient, and requires fewer holes in the cowl. The jack installation can be eliminated if desired. Top and bottom fuselage blocks, as well as the rudder-fin assembly and ventral fins, are permanently glued in place. The model is now ready for the final sanding.

Cockpit Canopy: Carefully draw the outline of the cockpit canopy on the nose section and cut along those lines. Remove the canopy area in one piece so that it can serve as the mold for forming a plexiglass canopy. Heat a piece of 1/16" plexiglass in an oven and, when pliable, draw it over the mold. Cut away excess plexiglass and fit the canopy to the model. Before installing the canopy permanently, add cockpit detail. For a free ready-made canopy, send me a photo of the Crusader in its final construction stages. Write: 384 Central Islip Blvd., Ronkonkoma, N.Y. 11779.

Finish: AeroGloss paints and plenty of rubbing were used to finish the plane. Details for color and markings came from *Profile Publication No. 90, Chance Vought F8A-E Crusader*. Lettering detail was done with Instatype dry transfer lettering.

Phantom

(continued from page 16)

After the control horn is properly fitted, carefully shape and assemble the flaps. For long life, use epoxy in this operation. Finally, hinge the flaps to the trailing edge and again check the wing for warps.

The main landing gear is bent to shape, J-bolted to the plywood platform and glued into place.

Assemble the fuselage main section (excluding scoops) in the conventional manner. Tack glue the top block and shape. Remove it and hollow it out. Join the main section to the wing, using fiberglass cloth and polyester resin. Check alignment. Shape and hinge the stab and elevator and add anhedra as shown on the plan. Reinforce the joint sparingly with fiberglass cloth and resin. The half horns must be fitted properly. Using one 3/32" section and two DuBro Kwik-Links, assemble the pushrods. Wrap the joint at 1/2" intervals with uncoated copper wire. Then solder it, using silver solder if possible. A good solder joint here is a must. Adjust pushrod ends and install them on the elevator. Install the other end of the pushrod on the flap control horn. Align and glue the stab to the fuselage.

The elevator and flaps must be neutral, and the controls must have free movement. Bend the axle section of nose landing gear wire. Join two sections with copper wire, wrap and solder. Slide copper or aluminum tubing over

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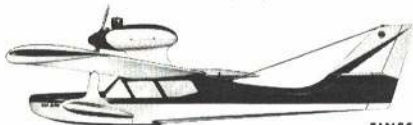
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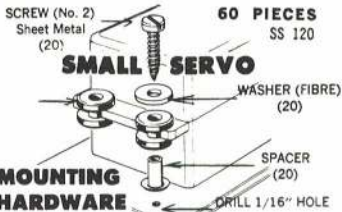
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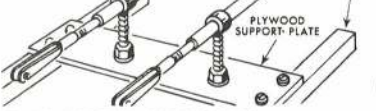
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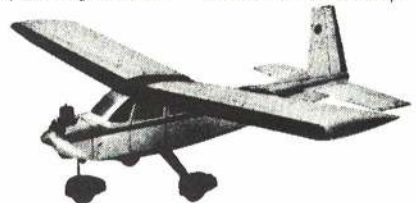
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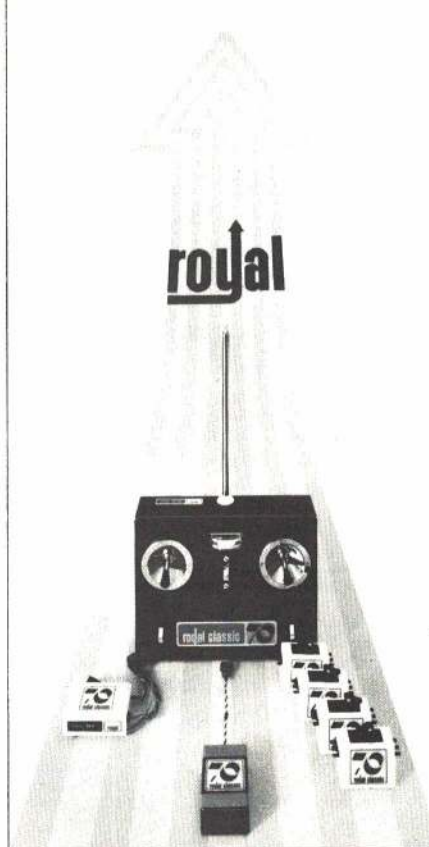
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the joint and make final bends. J-bolt the nose landing gear to plywood platform. Add all other necessary components, such as the nose landing gear, the tank, etc., to the fuselage main section. Now match the fuselage top block for rudder and stab and glue it to the fuselage. Shape the rudder and install. Glue air scoop bulkheads in place as shown on plan. Scoop sides are shaped, installed on the model and tack glued at the wing joint only. When dry, carefully bend scoop sides around the bulkheads. Add 1/4" sq. filler to scoop sides and 1/8" sq. to the main fuselage.

Fit and glue 3/16" thick sections to the top of scoop sides and fuselage. Glue and shape the 1/4" sheet fuselage bottom in place. Scoops are now fully contoured. Add all other details, such as fillets, spinner, etc.

Using a sanding block whenever possible, carefully and thoroughly sand the entire framework with fine sandpaper.

Much has been done with new finish and covering methods, but I still prefer the dope method. However, the choice is up to the modeler.

Brush on one coat of clear dope and sand lightly. Next, brush on two coats of a wood

filler consisting of one part talcum powder, one part AeroGloss filler coat, and one part thinner. Sand between each coat.

Cover the wing section with medium Silkspan. When the covering is tight, brush on five thinned coats of clear. Sand off any roughness. Silk-cover the entire nose, including the cowling. Then, add cockpit detail. The seats as well as instrument panels were made from pressed cardboard and epoxied into place. Mold the canopy from .040 acetate butyrate or plexiglass. Epoxy the canopy to the fuselage and add a 1/4" silk strip over the joint. Mask the canopy for painting.

Make up a filler consisting of one part thinner, one part talc, one part color finish, and one half part clear dope. Two coats of this filler are sprayed on, allowing at least one day for drying thoroughly. Sand between each coat. One coat of clear dope is sprayed on to seal off these coats.

By now the finish should be perfectly smooth and ready for color. Spray four to five coats of finish color but do not sand. Finally add the markings and AMA numbers, then spray on two final coats of clear. Allow the dope to dry for a least a few weeks before rubbing out.

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Finishing With Supercoat

BY MAXEY HESTER

After final sanding of the finished framework give it two coats of dope wherever you want the silk to adhere to the framework. Give these surfaces another final, light sanding. Remember that covering and paint won't cover up poor workmanship. Be sure all surfaces are smooth. Apply the silk wet but do not stretch too tightly, as it will only encourage warping later on. Pull the silk up just enough to get out all the slack and wrinkles. Point dope around the edges. This will soak through and adhere to the pre-doped framework. Let dry before trimming with a sharp double-edge (for thinness) razor blade. Check for any spots that are not stuck down and apply more dope.

Next give the entire airplane three coats of Supercoat Clear Dope. We recommend spraying if you have a spray gun. If you spray, reduce the dope at least fifty-fifty with Supercoat Thinner. If you brush, reduce the clear until it brushes easily and flows out nicely. The clear dope should fill the pores of the silk well. Next apply a fairly heavy coat of Sig Sanding Sealer. When dry, sand with No. 220 3M Tri-Mite paper. Be very careful over the ribs and the edges of the fuselage that you do not cut through the silk. Use care around stringers and any other projections, as these areas will sand through much faster than any open area.

Repeat the Sanding Sealer until you have a very smooth surface. It may be necessary to use a third coat. Low spots and rough areas can readily be seen by holding the model up to the light. If you have done a good job in preparing the surface, one or two coats of color will be sufficient. After the main color coat has been applied, mask off the pattern for the trim. After the masking tape has been applied, brush a thinned coat of clear dope along the edge of the masking tape. This will prevent the trim color from creeping under the edge of the tape. After the trim color has dried, spray a very light mist coat of clear over the entire airplane. When this has dried it can be followed by two or three fairly heavy coats of clear. The mist coat of clear forms a barrier between the wet, heavy coat of clear and the trim colors, so that the heavy coat of clear will not soften the trim colors and cause them to bleed and run. When the final coat of color has dried it can be wet sanded with No. 400 Wet-Or-Dry paper, being very careful not to sand through the clear coat. After sanding, buff with Sig Rubbing Compound, using a soft damp pad and generous amounts of rubbing compound. Use a brisk rubbing motion, rather than heavy pressure. When the surface has a smooth, glossy finish, wipe with a clean, dry cloth. Apply decals and a final coat of wax to seal the decals and protect the surface from dirt and grime.

Claude McCullough's Famous



YAK 18P

Featured in Color on the Cover of July, 1968 MODEL AIRPLANE NEWS

WINGSPAN 72½"



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FOR .60 ENGINES

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Repeat the Sanding Sealer until you have a very smooth surface. It may be necessary to use a third coat. Low spots and rough areas can readily be seen by holding the model up to the light. If you have done a good job in preparing the surface, one or two coats of color will be sufficient. After the main color coat has been applied, mask off the pattern for the trim. After the masking tape has been applied, brush a thinned coat of clear dope along the edge of the masking tape. This will prevent the trim color from creeping under the edge of the tape. After the trim color has dried, spray a very light mist coat of clear over the entire airplane. When this has dried it can be followed by two or three fairly heavy coats of clear. The mist coat of clear forms a barrier between the wet, heavy coat of clear and the trim colors, so that the heavy coat of clear will not soften the trim colors and cause them to bleed and run. When the final coat of color has dried it can be wet sanded with No. 400 Wet-Or-Dry paper, being very careful not to sand through the clear coat. After sanding, buff with Sig Rubbing Compound, using a soft damp pad and generous amounts of rubbing compound. Use a brisk rubbing motion, rather than heavy pressure. When the surface has a smooth, glossy finish, wipe with a clean, dry cloth. Apply decals and a final coat of wax to seal the decals and protect the surface from dirt and grime.



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FOR ENGINES .45 to .60

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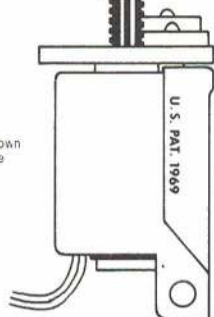
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Santana

(continued from page 32)

ribs. When dry, glue the 1/8" sq. spruce top spars in place. Cut all tip spars as shown and glue the top spar in the tip.

Epoxy 1/8" and 3/32" OD aluminum tubing into the W-0 wing ribs. While the wing is still pinned down, pin and glue the 1/32" balsa planking between the W-0 ribs.

When dry, unpin all the wing sections and

glue in the bottom 1/8" sq. balsa spars.

Cut all dihedral braces from 1/32" ply. Prop wing tips at 4 1/2" and glue in the angle, adding dihedral braces at the same time. When dry, cut six 45-degree angle gussets (see plan) and glue in at the required spots. Cut and glue diagonal braces from 1/16" sq. medium balsa. Set aside to dry.

Stab: Stab construction is basically identical to that of the wing. The stab trailing edge is cut from 3/32" sheet balsa and not

laminated. Stab ribs should be cut from soft 1/16" balsa or medium 1/32" balsa. The stab spar is glued in and then the 1/32" balsa webbing is added. Plank only the section of the bottom which is indicated on plans.

Fuselage: The front of the fuselage is a 1" dia. hardwood dowel, hollowed out to specifications. Fill the fuselage nose with melted lead or solder to the depth indicated.

An Estes rocket nose cone is used both for

(Continued on page 78)

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Super Sleek Streak

(Continued from page 50)

finger and mark the point where it balances. The curved wing-mounting pillow block is installed directly over the balance point. Rub a little glue "skin" on each wing's dihedral joint and let dry. Cement the wing to the mounting block and "glue skin" the joint after it has dried. Sight the wing from the top and from the rear while it is drying to make sure it does not get tilted or skewed in relation to the fuselage or the stab.

When the model is completely dry, sight under the wings from the front and from the rear to make sure there are no warps or twists. Warps can be removed by holding over steam and twisting in the opposite direction. The wings must have no warps if the Super Sleek Streak is to fly at high speed!

Flight Testing

Outdoors: Tie a 1/8" Pirelli rubber motor (square knot) and rub in a few drops of castor oil for lubrication. Oil the prop shaft also, with a light oil like 3-in-1. Pick a calm day and find the largest field around. Have a friend hold the prop while you stretch-wind the motor from the rear. Walk gradually toward the model. A hand drill with a wire hook is a handy winder. Use only 150 to 200 winds for the first hops. Gradually work up to a fully-wound motor when the model is flying well.

Holding the wound model as shown, release it into the breeze. Observe carefully exactly what the model does. Did it climb steeply? Spiral right or left? Did it dive all the way? To the right or left? Did it stall (climb steeply, then fall)? Did it loop?

Do not fly again without making a change

(unless the model made a smooth spiral climb up and a smooth glide down in about 20-ft. circles).

Making Corrections: To cure a loop or stall, check the wings for warps. Breathing on the wings and then bending them in the opposite direction will help. Re-check. If the wings are okay, try bending down the rear edge of the stab just a little. As a last resort, add a little modeling clay to the nose.

If the loop or stall was in straight flight, bend the rear of the rudder a little toward the desired direction for the plane's turn. (The SSS will fly in right or left circles). A little turn will help kill a stall. Be careful, because at high speed, too much rudder bend will spin the ship into the ground.

To cure a dive, make sure it is a true dive, and not the result of a bad roller-coaster stall effect. If it dives straight in all the way from release (assuming that the wings are not warped), bending the rear edge of the stab up a bit probably will cure it. Dives to the right or left usually are caused by warped wings or the rudder's being bent toward the inside of the circular flight (dive) path. Is the stab tilted as seen from the rear? SSS's almost never need clay on the tail to cure dives.

Indoors: The main difference for indoor flight is that less rubber is needed (3/32" Pirelli works well).

Sources for Materials: Rubber is available in fifty-cent packs from W. C. Hannan Graphics, P.O. Box A, Escondido, Calif. 92025. (A chain of No. 16 rubberbands will work, but not too well. Never use the too-powerful rubber that comes with the kit.) Nice 16:1 ratio winders can be purchased from Marlow Engineering, 6850 Vineland Ave., North Hollywood, Calif. 91605

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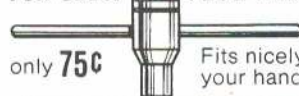
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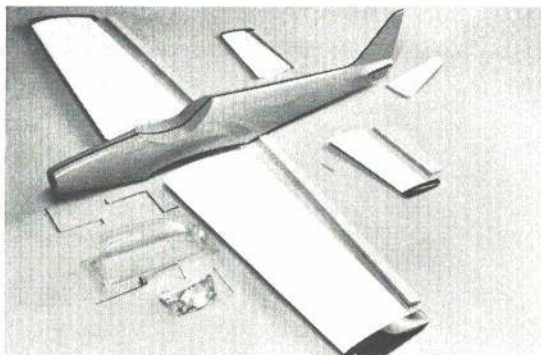
the nose of the Santana and to form a taper between the dowel and the fiberglass boom. A 1/4" dowel is used to connect the fiberglass boom to the front of the fuselage.

The pylon is made from two pieces of 1/16" ply with two ply formers and scrap balsa sandwiched between. Face ribs of 1/16" ply are glued onto the outside of the pylon. Holes are drilled through the top of the pylon to intersect with the wing wire holes. The wires are cut and inserted and epoxy is poured into the 1/4" holes to secure the wires. The pylon then is covered with 1/64" ply.

The 1/4 x 2" dowel is fitted to the fuselage and the boom epoxied to it. The nose cone is drilled through with a 5/16" drill. This fairing is then slid over the boom and epoxied into position (see plans).

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Wrap the fuselage with sandpaper and slide the pylon back and forth until a smooth fit and accurate position are achieved. It is essential that the pylon be at the correct angle in relationship to the rest of the fuselage. Epoxy the pylon to the fuselage.

All rear-end assembly (rudder, stab rest, etc.) is made from light balsa. The rudder is cut from 1/8" balsa sheet and sanded to a symmetrical airfoil shape. Use epoxy to attach the tail assembly to the boom. An F.A.I. Supply towhook is embedded into the fuselage.

Sanding and Covering: Trim down all leading and trailing edges with a razor-plane. Make up some 2 x 8 x 1/4" ply sanding blocks by gluing sandpaper ranging from 180 to 400 grit to the blocks with contact cement. Sand wing and stab surfaces to shape, using 400 sandpaper for a final finish.

Pre-dope all model surfaces with three coats of 50-50 thinned dope. The Santana is covered with colored Jap tissue, water-shrunk to a tight finish. Two coats of 50-50 thinned Sig Litecoat dope are put on the wing and then black tissue trim is added. The model gets six coats of dope, except for the stab which gets only four. Let each coat of dope dry overnight before the next is added.

Finishing Touches: After the doping is complete, epoxy on all hooks, aluminum plates and other small parts. Use 10-lb. test monofilament for auto-rudder and dethermalizer lines. The timer can be spring-loaded several ways but the best way is internally as on a Seelig Nordic timer. A nylon guitar string is used to trigger the auto-rudder and timer start. Remove all warps from the wing and stab by using the steam method. An F.A.I. Supply tow reel and line are the best bet for a tow winch.

Trimming and Flying: Test glide the Santana until a smooth, flat, right-hand glide is achieved. Test glide with the rudder in both positions, trying for a straight glide when the rudder is closed and a tight right glide when the rudder is open.

For first test flights, set the timer to dethermalize at 10 to 15 seconds. After a good, slightly right tow is achieved, start letting the timer run longer, adjusting for a good glide at the same time.

Santana will do over a minute in dead air but should be released in a thermal as often as possible.

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AMA Contest Calendar

(continued from page 62)

Site: Kickapoo Woods, H. Brazin CD, 4522 So. St. Louis, Chicago, Ill. 60632. Sponsor: Radio Control Club of Chicago.

May 22-23—Amarillo, Tex. ARKS Spring Fly-In. Site: Amarillo, B. Irwin CD, 3302 Lewis Ln., Amarillo, Tex. 79109. Sponsor: Amarillo Radio Control Society.

May 22-23—Council Bluffs, Iowa Cobra's First Annual RC Fun-Fly. Site: Club RC Field, H. Hough CD, 924 Avenue I, Council Bluffs, Iowa 51501. Sponsor: Cobra's Radio Control Club.

May 22-23—Lafayette, La. (AA) Third Annual Model Aviation RC Day. Site: Comeaux High School, J. Molan CD, P.O. Box 52344, Lafayette, La. 70501. Sponsor: Acadian Radio Control Club.

May 23—Tullahoma, Tenn. (A) 7th Annual Old Timer FF Meet. Site: Coffee Air Foiler Field, C. Tuthill CD, 101 Westwood, Tullahoma, Tenn. 37388. Sponsor: Coffee Air Foiler Model Club.

May 23—New Castle, Penn. P.O.R.K.S., Inc. 12th Annual Fun-Fly. Site: P.O.R.K.S. Field, Z. Allerton CD, 124 Richelieu Ave., New Castle, Penn. 16101. Sponsor: P.O.R.K.S. Inc.

May 23—E. Granby, Conn. (A) Sailplane RC Snow Gagger. Site: NCRCC Field, T. Gordon CD, 75 Brookhaven Dr., Glastonbury, Conn. 06033. Sponsor: Northern Conn. Radio Control Club.

May 23—Ohio City, Ohio SHOO Flyers MAC, Inc. Invitational Meet. Site: Club Field, D. Kraner CD, RR #1, Ohio City, Ohio 45874. Sponsor: SHOO Flyers MAC, Inc.

May 23—Syracuse, N.Y. United Pylon Racing Circuit: RC Meet. Site: Syracuse, R. Walder CD, 129 Westmoreland, Rochester, N.Y. 14620. Sponsor: Radio Control Club of Rochester.

May 23—Near Kerman, Calif. (A) Fresno Monthly FF Gas Meet. Site: Near Kerman, F. Gallo CD, 1725 Kehmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Exchange Club.

May 23—Gainesville, Ga. All South RC Airplane Water Carnival & Picnic. Site: Gainesville, L. Purdy CD, Oakwood, Gainesville, Ga. 30566.

May 29—Union, N.J. (AA) 17th Union CL Model Airplane Invitational. Site: Morrison Field, F. DeCicco D, 53 Broadview Ave., Maplewood, N.J. 07040.

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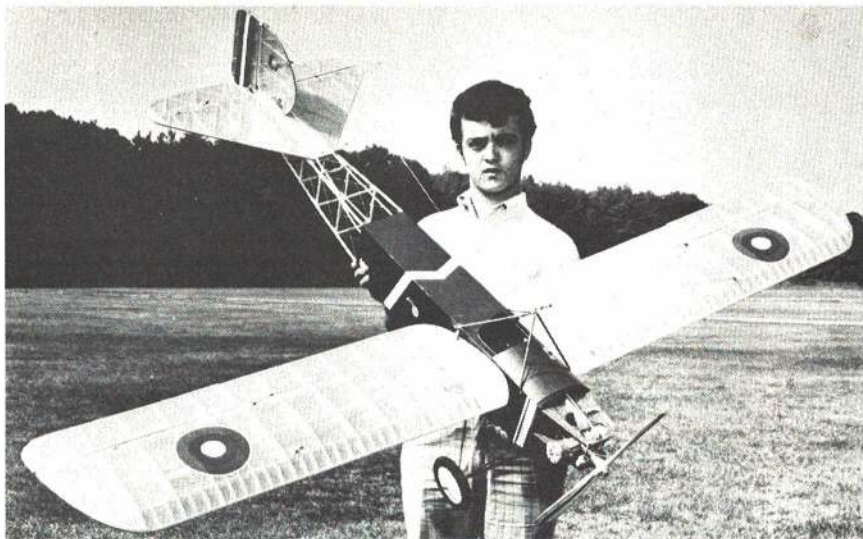
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May 29-30—Kingsville, Tex. (AAA) South Texas Navy Regional CL & RC Championships. Site: Kingsville N.A.S. J. Danbenspeck CD, Box 281, Bishop, Tex. 78343.

May 29-30—Shawnee, Kans. (AA) Shawnee Mission 1st Annual RC Meet. Site: Shawnee Park. B. Drummond CD, 9115 Charlotte, Kansas City, Mo. 64131. Sponsor: Shawnee Mission RC.

May 29-30—Ablene, Tex. (AA) Prop-Twisters Annual Memorial Day FF Contest. Site: Sea Bee Park. E. Thomas CD, 5349 Harwood, Abilene, Tex. 79605. Sponsor: Key City Prop Twisters.

May 29-30—Clarksdale, Miss. (AAA) Clarksdale Climbers 11th Annual FF (Cat. II) & RC Meet. Site: Fletcher Field. G. Pickel CD, 1631 Steen Dr., Clarksdale, Miss. 38614.

May 29-30—Schenectady, N.Y. (AA) Empire State RC Championships. Site: Schenectady County Airport. A. Sattler CD, 29 Waldorf Pl., Schenectady, N.Y. 12307.

May 30—Fiskdale, Mass. 6th Annual Spring Hydro Fun-Fly. Site: Brimfield Dam. J. Ross CD, 19 Sterling Dr., Dover, Mass. 02030. Sponsor: New England Radio Control Modelers, Inc.

May 30—Woodridge, Ill. (AA) First Annual Woodland Aero Modelers CL Meet. Site: Woodland Aero Field. O. Arnold CD, 2835 Grissom Ct., Woodridge,

Ill. 60515. Sponsor: Woodland Aero Modelers.

May 30—Chardon, Ohio (AA) C.R.C. "500" RC Pylon Races. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave., Euclid, Ohio 44132.

May 30—Oklahoma City, Okla. Central CL Championships. Site: Topping Park. R. Cloud CD, 4716 Judy Dr., Del City, Okla. 73115. Sponsor: Oklahoma City Controliners Model Club.

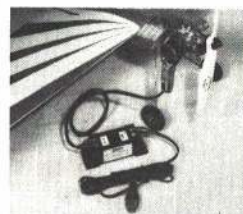
June 5-6—Spencerport, N.Y. (AA) 12th Annual N.Y. State RC Championships. Site: Spencerport. T. Salvemini, Sr., 6 Valley Ln., Avon, N.Y. 14414. Sponsor: Radio Control Club of Rochester, Inc.

June 5-6—Dahlgren, Va. (AA) National Capitol RC Tournament. Site: Naval Weapons Lab. B. Violett CD, 64 B. Rt. 1, Clarksburg, Md. 20754. Sponsor: DC/RC Club.

June 5-6—Lincoln, Neb. (AA) Lincoln Sky Knights 12th Annual Midwestern Open RC Meet. Site: Arrow Airport. R. Brimhall CD, 630 Broadview Dr., Lincoln, Neb. 68505.

June 5-6—Nashville, Tenn. (AAA) Mid-South 8th Annual RC Championships. Site: Percy Warner Park. B. Reuther CD, 218 Vaughns Gap Rd., Nashville, Tenn. 37205.

June 5-6—Cleveland, Ohio (AAA) The Cleveland Sport Race and 4th Annual "500" and FAI CL Team Selection. Site: Cleveland Model Flying Field.



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June 11-12-13—Monroe, N.C. 17th RCNC Invitational RC Meet. Site: Monroe RC Club. B. Helms CD, 800 Tyvola Rd., Charlotte, N.C. 28210.

June 12-13—Elk Grove, Ill. (AA) 10th Annual Chicagoland RC Contest. Site: Mile E of Rt. 53 on Higgins Road. D. Wehrhelm CD, 1841 W. Fletcher St., Chicago, Ill. 60657. Sponsor: Chicagoland Radio Control Modelers, Inc.

June 12-13—Houston, Tex. (AA) Houston RC Club Annual Contest. Site: Mabray Field. B. Striegler CD, 5831 McKnight, Houston, Tex. 77035. Sponsor: Houston Radio Control Club.

June 12-13—Oliville, Va. (AA) R.A.R.C. 11th Annual RC Contest. Site: RARC Field. C. Foreman, Jr. CD, RFD #4, Box 683, Mechanicsville, Va. 23111. Sponsor: Richmond Area Radio Control Club, Inc.

June 12-13—Erie, Penn. "Beginners Day". Site: Amco Field. M. Blue CD, 22 Hall Ave., Lake City, Penn. 16423. Sponsor: Erie Model Controllers.

June 12-13—Kansas City, Mo. (AA) Kansas City RC Annual Meet. Site: Lake Jacomo. B. Drummond CD, 9115 Charlotte, Kansas City, Mo. 64131. Sponsor: Kansas City Radio Control Association.

June 12-13—Fort Worth, Tex. (AAA) Texas State CL Model Airplane Championships. Site: Fort Worth Model Park. P. Davis CD, 1613 Carl, Fort Worth, Texas 76103. Sponsor: Cowtown Circle Burners Model Airplane Club.

June 13—Hadley, Mass. Hampshire County Thermal-Aires Meet. Site: H.C.R.C. Flying Field. J. Papageorge CD, 104 Rocky Hill Rd., Hadley, Mass. 01035. Sponsor: Hampshire County RC'ers.

June 13—Haymarket, Va. (AA) Third Annual FF Meet (Cat. II). Site: Snow Hill Farm. J. Clawson CD, 1846 Lushy Pl., Falls Church, Va. 22045. Sponsor: Fairfax Model Associates.

June 13—Chagrin Falls, Ohio (AA) 7th Annual E.M.A.A. Old Timer FF Contest. Site: Savage Road. Y. Didelot CD, 32997 Charmwood Oval, Solon, Ohio 44139. Sponsor: Erie Model Aircraft Assn.

June 13—Endicott, N.Y. (A) 6th Annual North-east RC Pylon Championships. Site: Tri-Cities Airport. R. Noll CD, 96 Pine Knoll Road, Endicott, N.Y. 13760. Sponsor: Aeroguidance Society, Inc.

June 13—Queens, N.Y. (AA) Forest Park M.A.C. Third Annual CL Contest. Site: Flushing Meadow Park. J. Drosch CD, 86-17 108th St., Richmond Hill, N.Y. 11418.

June 13—Van Nuys, Calif. (AA) Valley Circle Burners FAI CL Meet. Site: L.A. Model Airport. W. Netzband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

June 13—Lakewood, N.J. Novice Only RC Meet. Site: Lakehurst N.A.S. A. Schroeder CD, 18 Spencer Rd., Glen Ridge, N.J. 07028.

June 13—Harvey, Ill. (AA) Chicago Model Masters CL Model Meet. Site: Dixie Square Parking Lot. W. Webb CD, 15722 Vine Ave., Harvey, Ill. 60426. Sponsor: Chicago Model Masters.

June 13—Council Bluffs, Iowa (AAA) Eighth Annual CL Model Meet. Site: Iowa School for the Deaf. J. Dreier CD, 1918 Ave. B, Council Bluffs, Iowa 51501. Sponsor: Balsa Busters.

June 19-20—Des Moines, Iowa (AA) 2nd Annual RC Scale & Pylon Contest. Site: D. M. Modelaires Field. J. Bonanno CD, 201 S.E. Rose, Des Moines, Iowa 50315.

June 19-20—Denver, Colo. (AA) 13th Annual Mile Hi RC Meet. Site: Lowry AFB. H. Geller CD, 6920 E.



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June 6—Hadley, Mass. Hampshire Showdown Air RC Races. Site: H.C.R.C. Flying Field. R. Barkowski CD, 32 Lyman St., East Hampton, Mass. 01027. Sponsor: Hampshire County RC'ers.

June 6—Bristol, Conn. (AA) Hornets Model Classe CL Meet. Site: Edgewood School. J. Scott Jr. CD, 265 Witches Rock Rd., Bristol, Conn. 06010. Sponsor: Hornets Model Airplane Club.

June 6—Lancaster, Ohio FORKS 1/4 Midget RC Pylon Meet. Site: FORKS Field. J. Slater CD, 809 Forest Rose Ave., Lancaster, Ohio 43130. Sponsor: Fairfield Ohio Radio Control Society.

June 6—Little Rock, Ark. (B) 2nd Annual MARCS Fun-Fl. Site: Little Rock. F. Osborne CD, 18 Mohave, N. Little Rock, Ark. 72116. Sponsor: Mid-Arkansas Radio Control Society.

June 6—Wausau, Wis. 4th Annual Fun-Fly. Site: Club Field. K. Sparr CD, P.O. Box 441, Wausau, Wis. 54401. Sponsor: Wausau RC Sportsmen, Inc.

June 6—Elsinore, Calif. (A) Thermal Thumbers FF Meet (Cat. II). Site: Lake Elsinore. M. Keville CD, 5407 Pimenta Ave., Lakewood, Calif. 90712. Sponsor: Thermal Thumbers.

June 6—Mankato, Minn. (AAA) Mankato Modelers Regional CL Model Airplane Contest. Site: New Municipal Airport. J. Cattrysse CD, 806 Center St., N., Mankato, Minn. 56001.

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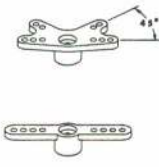


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June 19-20—San Jose, Calif. (AA) Wavemaster Annual RC Contest. Site: Wavemasters Field. K. Wilson CD, 728 Bolivar Dr., San Jose, Calif.

June 19-20—Dayton, Ohio (AA) Wright Brothers Memorial Annual RC Meet. Site: Wright Patterson Air Force Base. D. Lowe CD, 5936 Clar-Von Dr., Dayton, Ohio 45430. Sponsor: Western Ohio Radio Control Society.

June 19-20—Kent, Wash. (AAA) BMA Model Aeronautics Scholarship FF, RC, CL & Indoor Contest. Site: Boeing Space Center. J. Crosetto CD, 14800 SE 54th, Bellevue, Wash. 98008.

June 19-20—Olney, Md. (A) DC/RC-E.C.S.S. Soaring Meet. Site: Riggs' Field on Rt. 108. J. Stargel CD, 10625 Greenacres Dr., Silver Spring, Md. 20903. Sponsor: DC/RC Club.

June 19-20—Greenville, S. C. (AAA) South Eastern RC Championships. Site: WCRC Club Field. T. Neves CD, P.O. Box 19115, Greenville, S.C. 29603. Sponsor: Western Carolina Radio Control Club.

June 19-20—Fort Worth, Tex. National Fun-Fly RC Championships. Site: Fort Worth. B. Lutker CD, 6029 Walraven Cir., Fort Worth, Tex. 76133.

June 19-20—Dallas, Tex. (AA) Sun & Fun Annual FF Meet. Site: Mesquite Park. J. Murphy CD, 1305 Academy Dr., Arlington, Tex. 76010.

June 20—W. Suffield, Conn. (AA) Nor-East RC Air Races. Site: NCRCC Field. R. Granville CD, Fernwood Ln., Sonners, Conn. 06971. Sponsor: Northern Connecticut Radio Control Club.

June 20—Salem, N.H. (AA) Salem CL Model Airplane Fair. Site: Salem High School. R. Sherman CD, 408 River Rd., Tewksbury, Mass. 01876. Sponsor: Lawrence Air-Istrocrats.

June 20—Valley Park, Mo. Combat Cash Bash Meet. Site: Buder Park. G. Frost CD, 22 Glynn Dr., Florissant, Mo. 63031. Sponsor: Hot Heads MAC.

June 20—Ohio City, Ohio (B) SHOO Flyers RC Club Contest. Site: Club Field. D. Kraner CD, RR #1, Ohio City, Ohio 45874. Sponsor: SHOO Flyers MAC, Inc.

June 26-27—Marshall, Tex. (AAA) N.E. Texas FF & CL Model Airplane Championships. Site: Marshall Airport. T. Southern CD, 393 Eden Dr., #35, Longview, Tex. 75601. Sponsor: Northeast Texas Model Airplane Club.

June 26-27—Portville, N.Y. Southern Tier RC Fun Fly. Site: Route 395 So. B. Brown CD, 1255 High St., Bradford, Penn. 16701. Sponsor: Olean Model Airplane Club.

June 26-27—Wallops Isl., Va. (AA) MARKS Annual RC Meet. Site: Wallops Island. H. Jones CD, 59 Alghurth Ave., Baltimore, Md. 21204. Sponsor: Mid Atlantic Radio Control Society.

June 26-27—Wichita, Kans. (AAA) 11th Annual Midwestern FF, CL & RC Championships. Site: 13th

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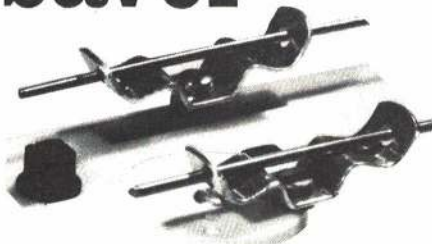


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June 27—Near Kerman, Calif. (A) Fresno Monthly FF Gas Meet. Site: Kerman, F. Gallo CD 1725 Kennore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

June 27—Valley Park, Mo. (AA) United States CL Model Aerobatic Championships. Site: Buder Park, T. Niebuhr CD, 1170 S. Florissant Rd., Florissant, Mo. 63031. Sponsor: **St. Louis Yellow Jackets.**

June 27—Hempstead, N.Y. (AA) Meroke 7th Annual RC Meet. Site: Mitchel Field, R. Geyer CD, 913 Washington St., Baldwin, N.Y. 11510. Sponsor: **Meroke Radio Club.**

June 27—Rockford, Ill. (AAA) Rockford Aeromodellers Annual CL Contest. Site: Riverdahl Park Model Airplane Field, A. Johnson CD, 1818 Oslo Dr., Rockford, Ill. 61108. Sponsor: **Rockford Aeromodellers.**

June 27—Cleveland, Ohio (AA) Flite-Masters 4th Annual CL Contest. Site: Cleveland Model Field, R. Kolthoff CD, 6408 Lawnwood Ave., Parma Hts., Ohio 44130. Sponsor: **Lakewood Flite Masters.**

June 27—Columbus, Ohio (AA) 6th Annual Eastland CL Championships. Site: Eastland Shopping Center, C. Hemmerly CD, 5607 Sandalwood Blvd., Columbus, Ohio 43229. Sponsor: **Capital City Controllers.**

June 27—York, Penn. (AA) York Line Tamers Annual CL Roundup. Site: Caterpillar Tractor Co. R. Denues CD, 2560 Sunset Ln., York, Penn. 17404. Sponsor: **York Line Tamers.**

June 27—Lockport, N.Y. United Pylon RC Racing Circuit. Site: Lockport, H. DeBolt CD, 49 Colden Ct., Cheektowaga, N.Y. 14225. Sponsor: **Niagara County Model RC Club.**

July 3-4—Lexington, Ky. (AAA) Mid-America CL & RC Championships. Site: Kearny Field, L. McFarland CD, P.O. Box 8177, Lexington, Ky. 40593. Sponsor: **Lexington Model Airplane Club.**

July 3-4—Orange, Mass. (AAA) 1971 Yankee FF Championships. Site: Ft. Devens, R. Harlan CD, 15 Happy Hollow Rd., Wayland, Mass. 01778.

July 3-4—Springfield, Mo. (AA) Springfield RC Club Contest. Site: Springfield RC Club Flying Field, G. Langston CD, 1300 W. Locust, Springfield, Mo. 65803.

July 3-4—Baton Rouge, La. (AA) Bayou State CL Championships. Site: F.S.U. Forestry Bldg. G. Cleveland CD, 540 Gebelin St., Baton Rouge, La. 70802.

July 4—Mentor, Ohio (AA) Fourth of July RC Races. Site: Club Field, Tyler Blvd. B. Penko CD, 21151 Westport Ave., Euclid, Ohio 44123.

July 9-10-11—Spokane, Wash. (AAA) Spokane CL & RC Internats. Site: Spokane Int'l Airport, R. Hepker CD, 142 ADW, Spokane Int'l. Airport, Spokane, Wash. 99219.

July 10-11—Chesapeake, Va. (AA) TRE 5th Annual AA RC Meet. Site: Fentress Air Field, M. Woolard CD, 301 Haledon Rd., Chesapeake, Va. 23320.

July 10-11—Oklahoma City, Okla. (AAA) Sooner State FF & CL Model Aviation Championships. Site: 128th & N. Western, M. McGee CD, 1805 N. Tulsa, Oklahoma City, Okla. 73107. Sponsor: **Oklahoma City Exchange Club.**

July 10-11—Oaks Corners, N.Y. Sky-Rovers RC Hobo Meet. Site: Club Field, Hayes Road, H. Ford CD, 11 Stephens St., Clifton Springs, N.Y. 14432. Sponsor: **Sky-Rovers Finger Lakes RC Club.**

July 10-11—Davenport, Iowa (AA) Davenport RC Society 3rd Annual RC Meet. Site: Scott County Park, C. Fox CD, 1841 W. 4th St., Davenport, Iowa 52802.

July 11—Elsinore, Calif. (A) San Valeers Sun & Fun FF Meet (Cat. I). Site: Lake Elsinore, T. Hutchinson CD, 880 A Magnolia, Pasadena, Calif. 91106. Sponsor: **San Valeers.**

July 11—Westminster, Md. Westminster Aero Modelers CL Meet. Site: Westminster Shopping Center, R. Pease CD, 65 E. Main St., Westminster, Md. 21157. Sponsor: **Westminster Aero Modelers.**

July 11—Canton, Ohio (AA) 11th Annual Canton RC Meet. Site: Canton Club Field, J. Yarger CD, 1100 Browning Ave., North Canton, Ohio 44720.

July 11—Van Nuys, Calif. (AA) Valley Circle Burners FAI CL Meet. Site: L. A. Model Airport, W. Netzeband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

July 11—Buffalo, N.Y. United Pylon RC Racing Circuit. Site: Buffalo, H. DeBolt CD, 49 Colden Ct., Cheektowaga, N.Y. 14225. Sponsor: **Erie County Model Aircraft Assn.**

July 17-18—Abilene, Tex. (AA) Prop Twisters 3rd Annual CL Contest. Site: City Airport, E. Thomas CD, 5349 Harwood, Abilene, Tex. 79605. Sponsor: **Key City Prop Twisters.**

July 17-18—Menomonee Falls, Wisc. (AA) 1st Annual Pre-Nats RC Warmup. Site: Aero Park Airport, F. Morrissey CD, 14100 West Park Ave., New Berlin, Wisc. 53151. Sponsor: **Milwaukee Flying Electronics, Inc.**

July 18—Ohio City, Ohio (A) SHOO Flyers RC Club Contest. Site: Club Field, D. Kraner CD, RR #1, Ohio City, Ohio 45874. Sponsor: **SHOO Flyers MAC, Inc.**

July 18—Newark, Ohio Licking County 5th Annual RC Club Meet. Site: Nethers Farm, A. Dupler CD, Box 186, Millersport, Ohio 43046.

July 18—W. Suffield, Conn. (AA) Nor-East RC Air Races '71. Site: Club Field, G. Sawn CD, 6 Audrey Ln., Enfield, Conn. 06082. Sponsor: **Northern Connecticut Radio Control Club.**

July 18—Davenport, Iowa (AA) 14th Annual CL Model Airplane Meet. Site: Davenport Airport, D. Mariet CD, 3009 Westmar, Bettendorf, Iowa 52722.

July 25—Near Kerman, Calif. (A) Fresno Monthly FF Gas Meet. Site: Near Kerman, F. Gallo CD, 1725 Kennore Dr., W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**



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July 31-Aug. 1—Pocatello, Idaho (AA) Pocatello Glue Angels FF & CL Invitational Site: Pocatello, E. Culver CD, 231 Fairbanks, Pocatello, Idaho 83201.
July 26-Aug. 1—Glenview Naval Air Station, Ill. (AAAA) National Model Airplane Championships. Traditional Events. For Nats entry blank send pre-addressed and stamped envelope to: Academy of Model Aeronautics, 806 Fifteenth Street, N.W., Washington, D.C. 20005.

REVIEW: THE VONCE A/3

by EUSLESS YARVIN

THE OTHER DAY while rummaging through my local hobby dealer's shelves (Sister Sadie's Edsl sales and model supplies), I found a new kit that must of been part of the first new shipment of kits that Sister Sadie has gotten in many years (remember that without Edsl sales she has no money to buy kits) and in this shipment I found a new kit of interest to the whole modeling community. The kit is called the Vonce and it is an A/3 free flight (Ha!) model kit.

The new kit changed my whole line of thought on model airplane building and

model airplanes. I think that if you've been thinking of taking up basket weaving, building these kits will convince you that it's much better than model building (I no longer build model airplanes).

The kit itself—I feel that this is one of the most revolutionary kits ever offered because it features many ideas that have been incorporated in high performance sailplanes including water ballast, chamber-changing flaps and tail parachute. The kit uses a combination of many materials to form a unique composite structure which utilizes a standard fiberglass boom, ultra-soft foam nose which includes the water ballast unit, super-soft ultra-light balsa LE and TE on the wing with cloth hinges on the chamber changing flaps. The ribs are made out some wood by-product that is either flakeboard, masonite or some other related material.

The wing spars are built up from 1/16" square strips into a geodetic framework as are the flaps. After construction of the wing is completed in the normal way and the

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auto-flap sensors are installed the intire wing is covered with a planking of thick Gabbon plywood to reduce waiviness on the laminar airfoil (a Worstone SX-660), the advantage of this type of covering was proven with the Slingsby Skylark sailplane and so the kit manufacturer, Vonce of America, must of thought that it was justified.

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The flaps work in anti-conjunction with a 28-ft. tail parachute which is also self-framing with a retractable frammissistis. This device is really amazing to watch and you readers out there who have experience with frammissistisses can tell what a sight this really is. Water ballast—as you already may or may not know already—water ballast is used to ballast water and change in this case the balance of the plane in the Vonce a special divice called a Jobbie senses the balance and changes it in flight by adding and subtracting water from the ballast chamber in the front of the aircraft.

Conclusion: I think that this is a very useful kit for all model builders to build and fly and will be on the model building scene for a very long time. As a matter of fact it'll probably be around until a new law of nature

is found or kangaroo's stOP eating kumquats

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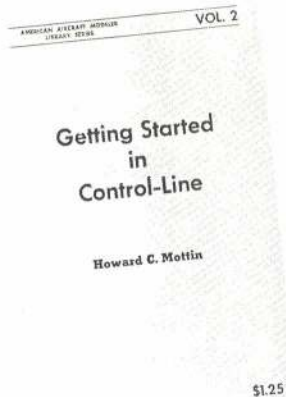
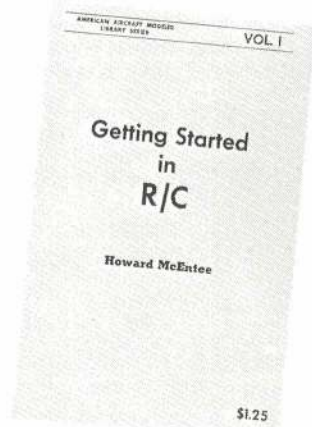
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The system then was installed and flight-tested in the Canyon Plastic Schweizer 1-26 foam plastic glider. The model is constructed of molded foam plastic with reinforcing aluminum tube spars molded into the wing. To provide attachment and load bearing, these spars mate with aluminum tubes molded into the fuselage.

The kit purchaser must epoxy only the tail surfaces together and to the fuselage, cut loose and hinge the elevator and rudder, and install the equipment, pushrods, and control horns. Then the glider will be almost ready to fly. At this point a decision must be made as to whether the glider will be flown one or all of the three ways. For a slope-soarer, simply add the desired color trim by tape, enamel or polyurethane varnish, or use sticky MonoKote.

However, if the glider is to be flown from tow line (it requires a good fast tower with lots of stamina, because it's a little heavier than the average Nordic!), hi-start, or off a winch, then a tow hook must be added. A stiff coat hanger was bent to conform with the nose shape, extending all the way from the tip of the nose to the point at which the hook was bent directly below the leading edge of the wing. A plywood insert was mounted to foam at that point and a prong bent at each end of the hanger wire for insertion

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about one inch into the foam. This assembly was thoroughly epoxied and proved to be quite durable as a combination skid and towhook. The location given was just right for hi-start operation and probably would work for the other two types of operation, although we didn't have the opportunity to check.

The kit comes with two canopies. One may be modified to accept a power pod. I would suggest a 3/16" plywood upright braced by 1/8" side formers faired with carved foam or balsa. A 10 engine is quite adequate. The canopy is restrained by 1/8" dowel and rubber bands. By using the two canopies interchangeably and installing the tow hook, the bird may be flown any of the three ways.

Installation of the equipment is unique. The fuselage is molded to accept the KPS-9 servos as a press fit. Similar pockets are provided for the battery and receiver. Channels are molded for plugs and wiring. An open space accepts the slide-switch which must be restrained by 1/16" double-sided servo-mount tape. By using wedges of styrofoam, the servo pockets were adapted to the Digiace servos. With all equipment installed, about 2 oz. of lead was added to a pocket provided to bring the CG to the location specified. Tubing is molded into the fuselage for pushrods to the tail surfaces. The pushrods were formed of 3/64" music wire with connection to the control horns via Du-Bro Kwik-Links.

Our bird was trimmed with sticky MonoKote and readied for flying in a total of about three hours. We used a slow-setting epoxy and let it harden overnight because penetration of the foam is better. By using five-minute epoxy, the job could be completed in three consecutive hours.

For flying, we used an excellent hi-start system developed by local glider expert, Ray Smith. First, the glider was given a few hand tosses to check alignment and trim. It wanted to turn to the right, but a few degrees of left rudder corrected this in the hand glides.

Pull-up on the hi-start was steep and straight as an arrow to about 200 ft. up. However, as soon as she was off the hi-start and slowed for a good floating glide, a rapid right turn was encountered. It could be corrected only by nosing over sufficiently to build airflow over the rudder, thus increasing the sink-rate unnecessarily. A careful check of wing alignment, which is fixed by the tubes molded into the fuselage, showed a difference of almost 1/4" in the leading edge position. Correcting this had us stumped for a minute, but the tool box yielded a rod the size of the wing spars. It was inserted into the offending misaligned tubes in the fuselage, and they were forced down (or up as necessary) to align the wings. Balsa was inserted to shim the tube to the new position, thus removing the wing twist. This assembly was latter epoxied permanently, and the ship provided many satisfying flights.

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Blue Ribbon Review

(continued from previous page)

This is an excellent glider for getting into the air quickly at a reasonable price, good for the beginner, and just plain fun to fly. A careful check of alignment should be made prior to flying, but any misalignment may be corrected readily. Don't expect to achieve fantastic soaring capability, the wing loading is a little high and a flat-bottomed airfoil is used.

The Digiace set and the Canyon Schweizer glider are both good performers. A few minor criticisms: the servo thrust should be somewhat higher to overcome potential pushrod drag. However, this simply means using more care in pushrod installation. The friction device for the throttle stick should be slightly stiffer. As for the glider, the manufacturer needs to be a bit more careful in jiggling the fuselage receptacles and wing spars to produce an error-free product.

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Colt 35—Alan Schwemmer's Class I winner. A docile flyer on a throttled-down 35, it lets the novice shoot touch-and-goes all day. Fly it full bore for aerobatic fun. (A pic of the above is enclosed too.)

Sunliner 365—Harry Murphy designed this FF with plenty of wing area to tame the hot 049 and 051 engines. He built it light yet strong for high performance.

Papa Taca IX—highly efficient design by Walt Perkins. Retractable landing gear cuts down on the frontal area; adds speed and laps. Lightweight too for acceleration.

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Neutrino—not an ordinary delta, this RC was engineered by Dave Youngblood. Fantastically stable and strange appearing, it matches a regular multi ship's performance. Power it with a 45.

Band Wagon—for the flyer about to try Wakefield FF. Brian Donn set out to design a simple yet sturdy model. It's easy to adjust too. Best of all the prop assembly need not give you nightmares.

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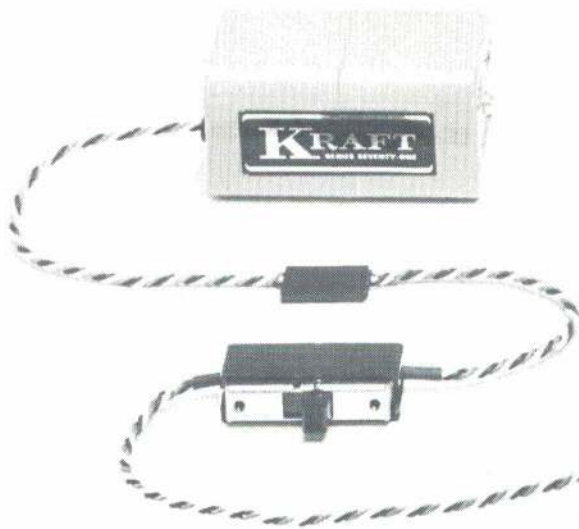
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Height- $1\frac{5}{16}$ Width- $1\frac{21}{32}$ Length- $2\frac{31}{32}$

Designed for economical, convenient Dry
Battery operation (batteries not furnished)

KRAFT
SYSTEMS, INC.

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World's Largest Manufacturer of Proportional R/C Equipment

Three for Fun!

Fun flying is in! The vast majority of RC'ers are Sunday fliers (You're right, Ken Willard). People like you, who just fly for the fun of it and could care less about all of the equipment needed for a full house competition airplane or they're people who fly gliders, sail boats or race cars. So, we've designed a brand new 3-channel system that provides the same year-in, year-out reliability and built-in MRC quality as our famous F-710 5-channel, a system designed to put digital proportional in the price range of the Sunday flier without the extra servos and paraphernalia he really doesn't need. The same precision *two axis* sticks.

We've used the same basic electronics . . . high power transmitter, integrated circuits and high resolution servos . . . that made our 710 famous.

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If you're a Sunday flier or feel that you really only need 3-channels, stop in at your dealer and take a look at the new MRC F-713. We think that you'll agree that it's Three for Fun.

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Extra Servos \$30. each.



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