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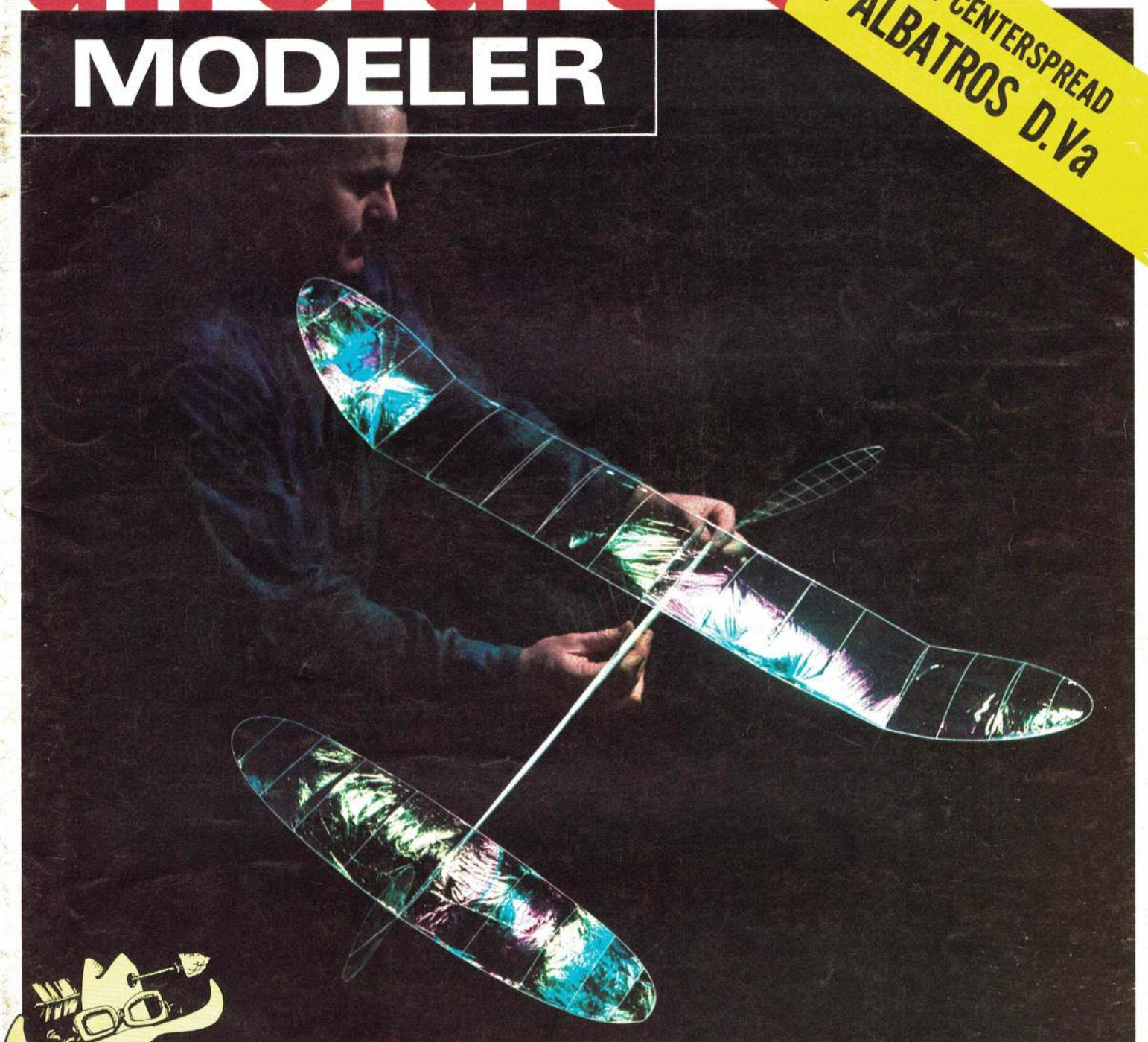
JUNE 1969

american aircraft MODELER

FULL-COLOR CENTERSPREAD
WW-I ALBATROS D.Va



A TENDERFOOT'S **BACKYARD FLYER** FOR RUBBER POWER

FUN FOR THE R/Cer **SKY SQUIRE COMPACTS** FOR 1/2A AND 09-19 POWER

AL RABE'S **SUPER** [redacted] **TER**

O.S. WANKEL

OS TO PRODUCE WANKEL ROTARY ENGINE

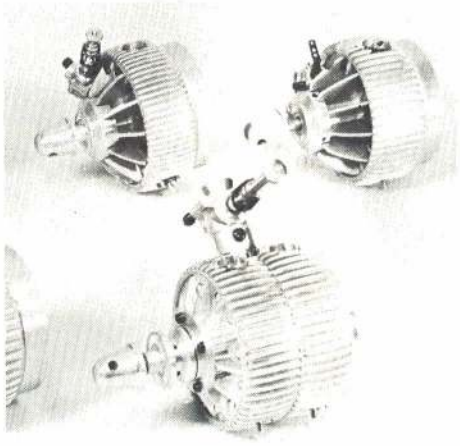
For the last year OS has been tooling up to make Wankel engines. The size that they have produced is a 30. You will see in the photo that they have put two of these together making a twin or a 60. This work has been done in conjunction with Graupner of Germany. The idea behind these engines basically is the absence of vibration and test models run very smooth. The arrangements for the sale of these engines in the United States have not been completed as this type of engine is patented and the decision regarding the distribution of these engines must be made by Graupner, Curtis Wright, OS and other people. However, in the early stages, World Engines is going to help OS publicize these engines. We might add that we hope to be the sales agency and service agency.

OS A FAVORITE FOR THE SMALL R/C ENTHUSIAST

You will notice that the new price list of OS engines to the right shows a modest price increase right straight through the line. This is the first price change on OS engines that we have made in years and it is long overdue. The prices of OS engines generally are still competitive. The quality and general overall workmanship on OS engines and on their radio equipment is extremely nice. Look these engines over carefully in your dealer's showcase. The small R/C engines like those pictured, the 10, 15 and 19 and also the light series 30 and 35 are extremely popular, particularly with the recent miniaturization in radio equipment.

OS-R/C EQUIPMENT WITH JEWELERS TOUCH

Shown in this picture is the new OS 2 channel radio equipment. This is basically laid out for rudder and motor control. The motor control lever on the left could be spring loaded so that it could be used for elevator. This equipment retails for $139.98. This is for digital proportional. OS also makes a more customized set in 3 channel for $199.98. The supply on these is tight and we are urging dealers to get their orders in well in advance on this 3 channel equipment. OS circuitry is for the most part conventional and straight forward. World Engines Service Experts have OS diagrams.



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VOLUME 68, NUMBER 6 JUNE 1969

COVER PHOTO: Dan Belieff built this Class D microfilm-covered model. Span is 36 in., weight 1½ grams. He logged 10 mins. under 20-ft. ceiling. Larger area needed for 30 mins. plus. Photo by Frank Pierce.

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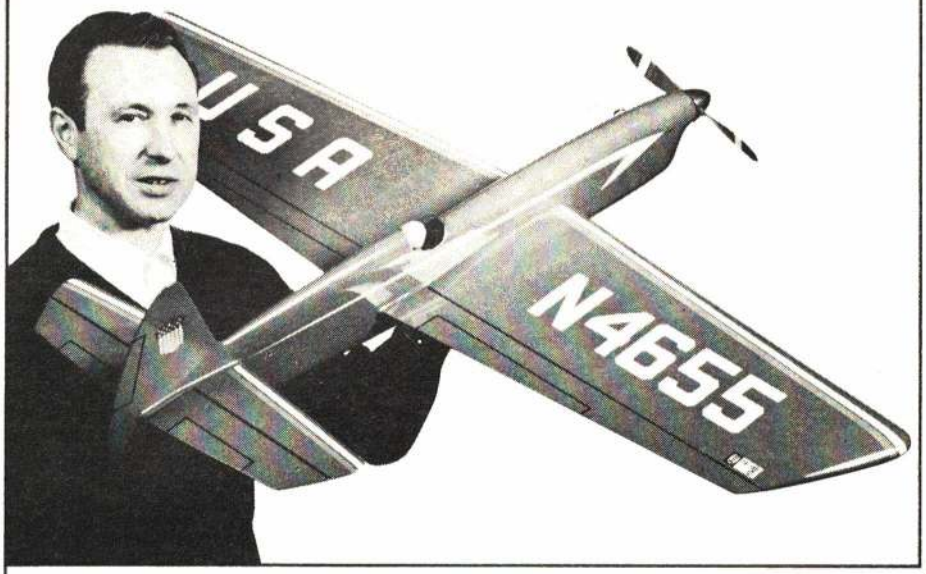

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STRAIGHT AND LEVEL

Serious claims that Whitehead may have been first to fly demand long overdue investigation.

GUSTAVE Whitehead, forgotten man of aviation, died a pauper in Fairfield, Conn. on October 10, 1927. Discredited and ridiculed for more than six decades Whitehead has been as effectively isolated from his place in history as the fictional "man in the iron mask" had been barred from the kingship of France.

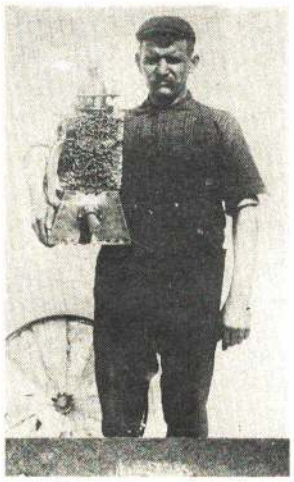
Whitehead's crime was that he might have been the true father of flight. Evidence that he had flown on August 14, 1901, more than two years before the Wrights — and he might have flown before then — was so strangely intolerable that, to this day, this demonstrated genius has been deprived of fair trial by eminent authorities. Actually, no one among the growing list of Whitehead supporters would detract from the Wright Brothers' great achievements. They merely want Whitehead claims accorded objective investigation. He was at least an authentic pioneer.

In the April 1, 1902 issue of the *American Inventor*, appeared a three-page article by Whitehead about his No. 22 airplane. Powered by a compression-ignition kerosene-fueled five-cylinder engine, it had been built in four months with the aid of 14 mechanics at a cost of $1,700. Similar, except for acetylene gas fuel, No. 21 — described in the November 1968 American Aircraft Modeler — reputedly made the first flight (over a half-mile claimed) at Fairfield, Conn., on August 14, 1901. In the *American Inventor*, Whitehead described several flights by No. 22, including one of almost seven miles duration, and another of 200-foot altitude during which full circling flight was achieved by steering and variable control of twin propellers. Water landings were made on its boat-like fuselage.

Interesting features included folding wings and tail, front wheels drivable by the engine, and rear wheels steerable, while on the ground. A pendulum device — widely used successfully years later on free-flight models in England — was intended, like an automatic pilot, to help maintain equilibrium. Concluding a matter-of-fact article — impressive to the present-day reader — Whitehead commented, "To describe the feeling of flying is almost impossible for, in fact, a man is more frightened than anything else." And, " . . . I do not care much in being advertised except in a good paper like yours. Such accounts may help others who are working along the same line."

What did bring Whitehead disastrously to public attention was a full-page article in the August 18, 1901 issue of the *Bridgeport Sunday Herald*. The editor stated that Whitehead was the first to solve the riddle of flight, and included the inventor's description of the flight. This claim plagued historians — and Orville Wright who stated ". . . design . . . is . . . enough to refute statements the machine flew." The Herald story was ignored, but articles about Whitehead's powered flights were carried in leading aeronautical magazines and journals. Recent tunnel and model tests prove #21 fully flight capable.

Eye-witnesses of Whitehead flights exist. Some have been interviewed, others ignored. Some, never questioned by indifferent authorities, have died. By far, the strangest story, concerns one, Louis Davarich, who had been associated with Whitehead in Pittsburgh *before* Whitehead moved to Connecticut. Interviewed by Stella Randolph in the 1930's, Davarich recalled how he *and* Whitehead flew an aircraft into a building, exploding the boiler of its steam engine. The statement was verified by Mrs. Whitehead. A present-day member of the Fairfield Police Department, and nephew of Mrs. Whitehead, saw the scars, which Davarich explained to him. Davarich is dead.



The late Gustave Whitehead stood with his lightweight two-cylinder air-cooled engine of 1902-3 at Blackman's Studio at 148 Fairfield Ave., Bridgeport, Conn. His easy stance contradicts opinions that his engines were heavy. By his side is the bicycle wheel, with blades inserted, which had been used while conducting early-type wind-tunnel tests in his Pine Street shop (which the Wrights visited in 1903). This again contradicts former views that he had not conducted extensive airfoil experiments in shop experiments.

Photo Courtesy, G. Whitehead family. © 1968 Stella Randolph.

In 1965, Lt. Col. Bob DelBuno, of the 9315th Air Force Reserve Squadron, interviewed Mrs. Davarich in Miami. The transcript shows she sat in the Pittsburgh aircraft which made a short hop. If true, she would have been the first powered-aircraft passenger.

Also interviewed by the Stoneham Papers in the mid-thirties, Mrs. Davarich, has again been located, thanks to a letter from her son to Major O'Dwyer (author of our November article) via a subsequent Randolph article in

Continued on page 71

Likes those easy plans

I have used your plans in the Feb. issue. Although I have not yet flown this plane, I think it is a success from its test glide.

Have finished building my Mini-Rod from the instructions and plans, and have test-glided the plane, and had a little trouble with balancing it. After a few simple cracks in the pylon, I have found the right point of balance. I cannot wait until a calm day comes so I can fly the plane.

Thanks for your easy-to-follow plans, and detailed instructions.

David S. Castner, Eighth Grade Student
Ambler, Pa.

No longer ten cents

Regarding the little Citabria article in the Feb. '69 issue, I had suggested the use of a North Pacific "Astro Gnat" prop for it.

Evidently the ten-cent Astro Gnat, which was available at the time I wrote the article, has been discontinued, or at least is not being stocked by most hobby dealers. (I always wondered how they could sell that plane for a dime!)

At any rate, the same 4⅛" diameter plastic prop is still available in the North Pacific "Skeeter" which sells for 15 cents . . . still a bargain.

Bill Hannan, Escondido, Calif.

Was Whitehead first?

The article in your Nov. '69 issue, "Did Whitehead Fly Before the Wrights?" was most interesting. So much so, that I found myself searching for more material on this subject. It certainly seems that there was and is proof that he did.

But the main concern, I feel, is why is it so many people feel that his plane had no controls with which to maneuver? I agree that his #21 did not, but he never claimed it did. Also, he never claimed anything other than nearly straight flight, banking slightly by shifting his weight to miss a group of trees. The ship he claimed to fly in a circle and turn as he pleased was #22. This ship was equipped with an elevator which could be controlled by the operator or automatically by his "automatic apparatus," which was a weighted-pendulum connected by a long rod to what he refers to as a small "aeroplane."

Of course, in the old days an aeroplane was a flat surface, and in this case, an elevator. If just speeding up and slowing down the motor wasn't enough to control the up and down motion of this ship, there was an elevator to help.

As for controlling the lateral or right and left movements of this ship, he often refers to a "rudder." However, I cannot see a rudder on this plane. Here again, in the old days, rudder often meant tail or elevator. So, it's highly possible that when he speaks of "turning the rudder," he may have in fact been referring to moving the whole tail section (some 12 ft. of it) to the right or left a little. This would for sure have some turning effect upon the ship, especially if he applied a little up elevator and drove one propeller faster than the other. It certainly seems to me that this would turn an aircraft of a design like his #22. Nowhere in any of his letters do I see any reference to turning his ships by pulling on the wires as Herr Leinert indicates he is doing with his models. The wires were there to "keep all the parts in their proper relations."

It must be remembered that his #22 was very light, was strong, and was a powerful ship. The wing ribs were made of steel tubing and covered with silk. The props were made of wood and covered with very thin aluminum sheeting, were 6 ft. long and had an area of 4 ft. each. The body was of wood and steel framing and was also covered with aluminum, and it weighed only 60 lbs. The motor was a five-cylinder 40- to 50-hp diesel engine. Probably the first diesel ever built. He called it a kerosene engine. It weighed only 120 lbs. and put out 40 to 50 hp at 800 rpm. It required a space of only 16 x 48 x 16". I believe this ship to be fully capable of powered and controlled flights.

However, still not satisfied with the performance of his craft, Whitehead designed and built still more planes. Numbers 23 and 24 were even better ships. Still, they looked just like the #21 and #22, but they had an elevator in the rear. The whole tail section was moved up or down by compressed air. Sort of an early "power steering," if you will. Also, the set or angle of each wing could be changed by the same method. So, he didn't have ailerons or wing warping — he just moved the whole wing a little.

Another first, I believe, on the #24 was variable-pitch props, which could be adjusted while in the air. Also, what is bound to be the beginning of instrumentation in aircraft, an "apparatus" for measuring the thrust of the propeller while flying. Not to mention the fact that the wings and tail would fold up along side of the ship for driving on the public streets. So, was this not also the first flying car?

All of these interesting facts and many more are contained in Miss Stella Randolph's book, *Before the Wrights Flew*. For most of them however, you must read the very small print in the back of the book. A good magnifying glass and a bright light are extremely helpful.

Another good book that may prove interesting is *Who Really Invented the Airplane*? by David C. Cooke. Both these fine books are available to anyone with a public library card.

Bill Campbell, Indianapolis R/C Modellers Club
Indianapolis, Ind.

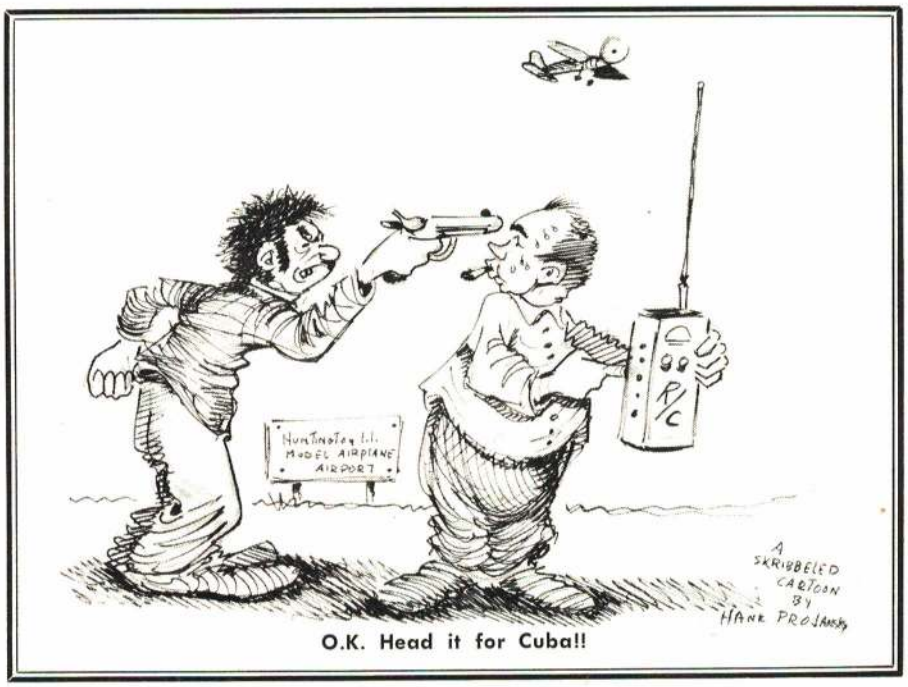
How about it?

I've been thinking about your magazine. It's great, but it needs something.

How about a section especially for the beginner R/Cer? A section with beginners writing in telling about their planes and equipment. You could also have a section for helpful hints, and things that can happen and how to prevent them, in the process of building planes.

I'm building a plane made by Midwest called Esquire. I've found a lot of problems confront the beginner. Some guys like to build their own planes and send the plans to you. So suppose you also do this with single-channel planes.

Howard McEntee said in his R/C primer: "Actually in some ways it takes a better flyer to do all this with just rudder than with rudder plus elevator or other controls, so rudder-only isn't to be sneered at." I agree with him because I have seen both rudder-only and multi-planes flown. There



O.K. Head it for Cuba!!

might be a few multi gentlemen building single-channel jobs.

I'm thirteen.

Geoffrey Richards, Cayucos, Calif.

The best are built from scratch

I have been a modeler for about three years. In all that time, I built about five kits, divided between two free-flights and three ukies. Now each time I was ready to fly a kit, something would go wrong. Either the wing would fall off, or after the specified engine was bolted on, it didn't have enough power, or kits that claimed to have the best die-cutting in the world, have their parts falling apart as soon as they are punched out.

In fact, the only plane of mine that ever flew was a hand-launch glider that I built from plans, and did it fly. It seems to me the only planes that ever fly are built from scratch. And most plans are too complicated for me.

What can I do? My telephone number is 914-SW3-5180, for any who would like to call and help me out. I'd appreciate it.

P. S. I'm thirteen years old.

Robert DiStasio, 94 St. Eleanora's Lane Yonkers, N. Y.

Thanks a million!

Three cheers for the 1969 AAM Annual. Those who find fault will have to work hard to find it.

Keep up the good work. I hope a 1970 AAM Annual is planned.

Robert Lonseth, Sylvania, Ohio

Picky-types

Boy oh boy — those guys that are nit-picky-nutty about the colors on scale aircraft are sure nutty. They argue about this color and that color not being right. You know — the colors on a model don't match some faded WW II aircraft. They run around scraping bits of paint of some junker that's been sitting in a scrap yard and claim, "this is it!" Who knows, but some joker mixed two or three or four cans of goop and thinner and who knows what together to get enough paint to use in the first place. These picky types have even been known to scrounge surplus dealers for old cans of paint.

But do you know that most don't realize an aircraft's colors appear different when in flight than when sitting on the ground? Ask them sometimes about skylight and how it adds blue to the shadows. And ask about the Kelvin temperature of sunlight and how it varies all over the globe — as much as a 1,000 degrees or more. Good grief!

Ralph E. Swingle, Amelia, Ohio

Bob Lien remembered

Unfortunately, it is my first official act as the new secretary of the Crescent City R/C Club to have to inform you of the passing of our fellow club member, Dr. Robert Lien. Bob suffered a fatal heart attack on Feb. 1, 1969.

All of those who had the pleasure of knowing and associating with Bob, can at least gain some solace from the knowledge that Bob was stricken while engaged in that which he most enjoyed, flying a high-performance R/C model airplane.

Many of us who knew him best often joked that Bob tolerated the practice of medicine so that he could do the important work of flying and building model airplanes. However, it was no joke with Bob. He was an ardent competitor and a complete modeler having designed several successful R/C aircraft.

Bob was always ready with a helping

hand for the tyro, and many of our club members have Bob Lien to thank for their flying skills today. Prior to his untimely death, Bob had been devoting much of his time to establishing a series of sessions designed to upgrade the flying skills of the club to contest performance.

We shall miss him and we extend our sincerest sympathies to his family and friends.

Oswin O'Brien, New Orleans, La.

Starting a modeler's library

I am only interested in R/C. I find it fantastic. That is why I am writing for a copy of "Getting Started in R/C." And I would like to know how I could get a subscription to AAM.

On Jan. 5, 1969, I went to a hobby shop and saw your magazine. I looked through it, and got it. Since then, and up till now, I have almost been glued to it. Since your subscription offer expired Dec. 31, 1968, I would like to know how I could get one.

I am going to make a copy of your "Getting Started In R/C" order form. I messed up the form you gave me a little.

I'm starting a modeler's library. Enclosed is $1.25 for one copy of "Getting Started in R/C."

Steven Wexler, Bronx State, N. Y.

Subscription rates for one, two, and three years are listed every month at the foot of the contents page. Yeah, Steve, R/C sure is fantastic. Ed.

More about flying aces

I have read your Feb. '69 issue and think it's great. I especially liked the story on Baron Manfred von Richthofen.

I would like to make a suggestion on your magazine. I think that you should have more stories of famous flying aces in future issues. I am sure many other people besides myself would find these interesting.

Do you have any suggestions on how I could start a model plane club among my friends? I would appreciate any advice you could give me.

Dave Brant, Salem, Oregon

Anyone interested in starting a model club should write John Worth, Exec. Dir. of the Academy of Model Aeronautics, 1239 Vermont Ave., N.W. Washington, D.C. 20005. AMA has special literature on the subject. Ed.

The longest wait

In the Nov. issue, you received a letter from David Forlime, Evington, Va., stating how mad he was at the slowness of manufacturers in sending out orders.

He stated that he had waited about four weeks for his R/C plane to arrive. I am unhappy to announce that the "I've-waited-the-longest-for-my-mail-order-plane-to-arrive" award has been stolen by myself. The new time is an unbelievable two months, two weeks, and four days.

My main complaint is that the first two planes that I ordered were advertised in ads in several magazines, but when I ordered them, they were found to be out of stock! Why someone would advertise a plane they haven't got is beyond me.

Another complaint is that I didn't even get a letter telling me that this item couldn't be had until I wrote the company inquiring as to why I hadn't received my plane. This was after six weeks of waiting.

I have now ordered another plane and have waited three weeks already.

The only thing I can't complain about is American Aircraft Modeler. At least it comes in on time. Keep up the good work.

Steve Manire, Hot Springs, Ark.

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1/32 x 6 x 36	10	12.50	9.38
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3/16 x 3 x 36	10	6.00	4.50
3/16 x 4 x 36	10	8.00	6.00
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BACKYARD FLYER

Although slightly more complicated than previous Tenderfoot models, this bird offers experience with light-weight construction for good long flights.

When he was 12 years old, the author designed this easy-to-build rubber job. It will out-perform most small kit models.

GARY HEEB

AFTER returning home from the 1966 Chicago Nationals, I decided to build a small rubber-powered model to fly around the backyard. Since my rubber-powered Wakefield "Stratowake" won second at the Nats, I scaled down, modified and simplified this basic design. The result is a small easily built rubber-powered model which Richard Anderson named the Backyard Flyer. This model was designed to be flown for fun in a small area. It is not a contest model but is a plane a beginner can learn and have fun with. And the model is not complicated with prop-carving and making a prop-hinge fold mechanism. But the main thing I had in mind when designing and building the Backyard Flyer was a model which I could fly in my backyard.

The first step is to build the wing and stab so that by the time the model is completed, any warps will be developed. Then they can be removed before first flight.

Select only choice straight-grained balsa wood; try to get the strongest wood possible. If you want a really strong model, use the next size larger wood. The extra weight will decrease the flight performance, but the model will survive many more crashes and rough landings. For the wing, I strongly recommend that you use spruce for the leading and trailing edges and the spar. Spruce has a little extra weight but will make a strong warp-free wing. Use Sig balsa and spruce for the best results.

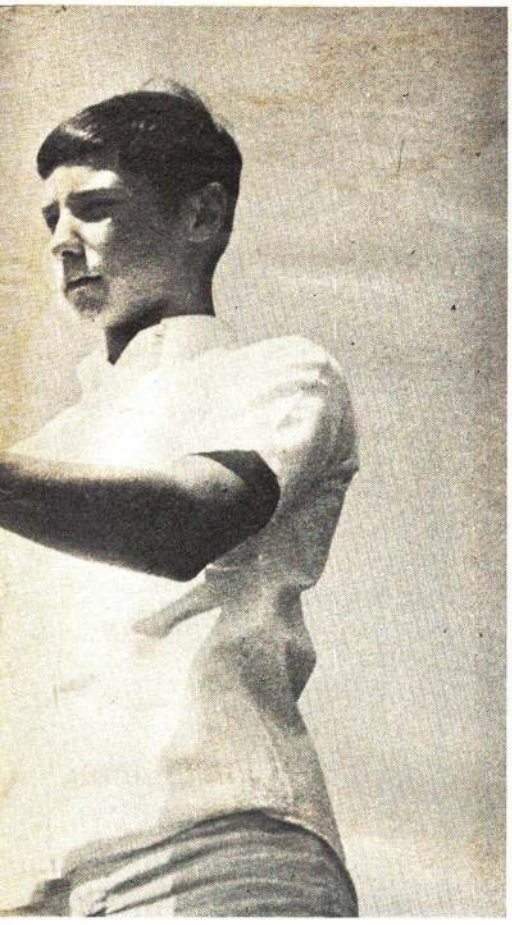
Make a hardwood or aluminum template of the wing rib including the spar notch and two pin holes. The pin holes assure that the template will stay in place when cutting out the ribs. It is very important to cut out all the ribs accurately; this will keep the same airfoil throughout the wing. Cut out ten ribs from very hard $\frac{1}{32}$ balsa sheet, using the template; make sure to notch the ribs carefully for the $\frac{3}{32}$ spar. Pin a $\frac{1}{8}$ sq. spruce leading and a $\frac{1}{16} \times \frac{3}{16}$ spruce trailing edge to the plan. Pin the wood down to the plan at the exact location. Do not stick pins through the wood but to edges, and use small weights to hold down the wood. Glue in the ribs, leaving out the ones at the dihedral joints. Glue small triangles to the tip ribs as shown in plan; add $\frac{3}{32}$ tip sheets to the outsides of the tip ribs.

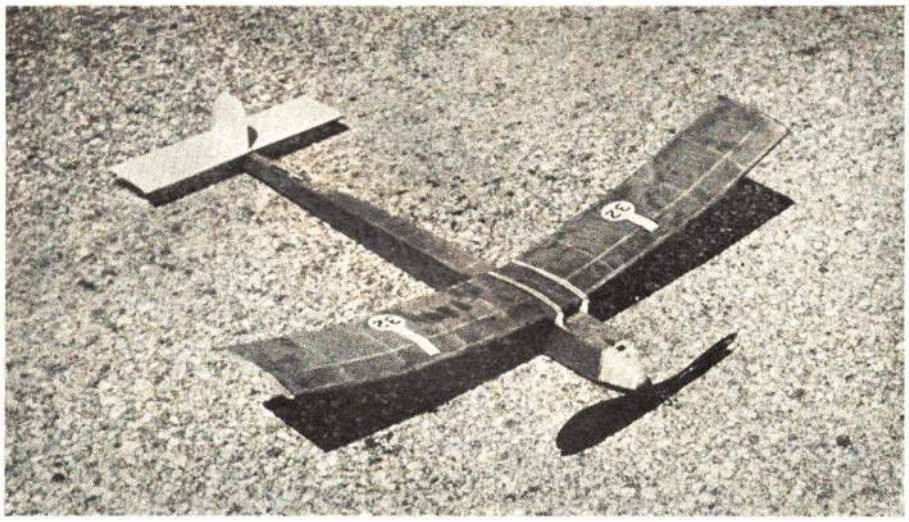
Cut the wing at the dihedral joints, bevel the leading and trailing edges to the proper dihedral angle. Prop the wing up to the correct dihedral measurement and cement; it is best to double cement before gluing the wing together. After the wing is throughly dry, glue in the remaining ribs. Next, cement a $\frac{3}{32}$ spruce spar in place, making sure that you have a good fitting glue joint at the dihedral break. Glue large gussets to the ribs at the dihedral joints. These gussets will greatly increase the strength of the wing and could be added to every rib if desired. Sand the leading edge to the proper airfoil shape; next sand the tips to the correct contour. Finish sanding the wing, making sure to smooth out any bumps or rough spots. Reglue all joints!

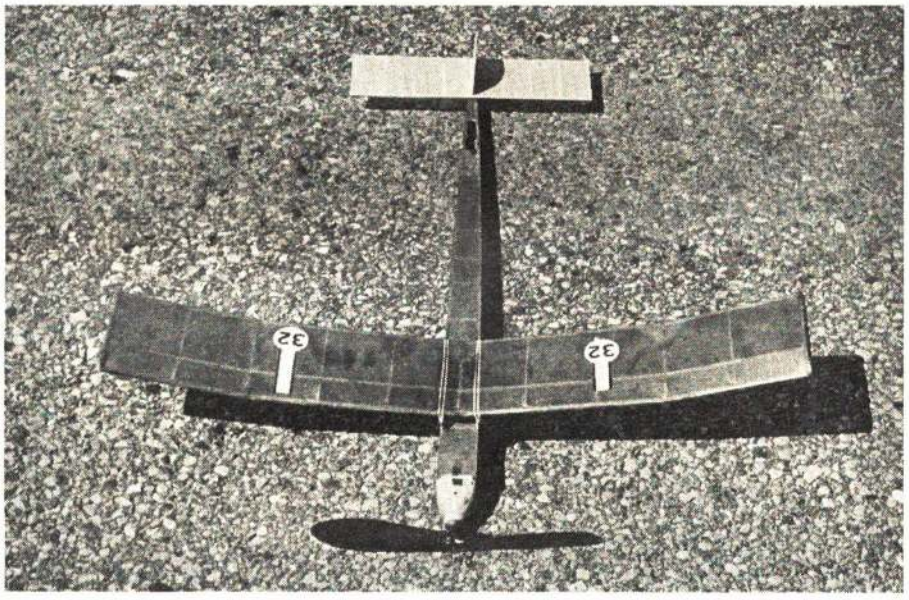
Use the wing rib template to make the stab ribs. Take the wing rib template and lay it on top of the stab rib shown on the drawing. After finding the same contour, mark the leading and trailing edge location on the template. Cut a sheet of $\frac{1}{16}$ balsa (with the grain running chordwise) to the exact length of the stab rib. Use the marked template and cut around the top edge, slide the template down the required distance and again slice around the top edge. After cutting out the ten required stab ribs, pin down the leading and trailing edges to the plan and glue the ribs in place. Go over the wing and stab frameworks lightly with sandpaper, smoothing out all the bumps and rough spots.

Predope the wing and stab outline surfaces. After the precoat is dry, dope the outlines of the wing and stab and cover, making sure the grain is running lengthwise. Let the dope dry thoroughly and lightly spray the wing with water. Thin down covering dope and add a few drops of castor oil. The castor oil will help prevent warping. Dope the wing with one very light coat. Do not water spray or dope the stab. If any warps appear, twist

Don't Forget: Tenderfoot Funtique Contest entry deadline is May 15th.







Plans show a built-up wing and tail with stronger, simpler all-wood fuselage. A Kaysun plastic 8″ dia. prop is powered by four strands of ¼″-wide flat rubber. Author tells how to get the most turns into the motor and adjust the plane for greater duration.

the wing over steam or a heat lamp in the opposite direction of the warp and hold for a few seconds and cool.

Make a paper template of the rudder, pin it down to a sheet of 1/16 balsa, and draw around it. Cut along the line and remove the rudder from the sheet. Sand and glue the rudder into the slot provided in the stab, making sure it is perfectly square with the stab.

Make a template of the fuselage (side-view), pin down the template to a sheet of 1/16 medium-hard balsa and mark its outline with a ball-point pen. Cut the fuselage side out, following the drawn lines; repeat the procedure making the opposite side. Take the two fuselage sides and add the 1/16 sheet rubber peg reinforcement. After letting the reinforcement peg sheets dry, drill a 3/16 hole for the rubber peg or tube. Glue the two sides together at the rear as shown in the plan.

After the rear joint is dry, place the fuselage between two parallel surfaces, such as two boards or two long aluminum angles, and glue the cross members to the body only at the parallel front part. Then glue in the remaining rear cross members. Add the top and bottom 1/32 sheets to the fuselage, trim the excess balsa off the fuselage and sand. If you want to do a good job on your fuselage, cover with tissue; this will increase the fuselage strength and will make the model look better. Pour a small amount of dope inside the fuselage, shake and pour it out. This will prevent rubber lube from soaking through the wood. Glue the stab on the fuselage, making sure it is on square. Double glue the stab joint and the fuselage seams.

Make the nose block by laminating ten pieces of 1/8 sheet balsa together. Glue the nose block hold-in piece, which fits inside the fuselage, to the rear of the laminations. Trace the body nose outline on the nose block, carve and sand to the correct shape. Drill the thrust-hole with plenty of down-thrust as shown on the plan. Glue the hardwood thrust-button in place. For extra strength, rub glue into the nose block. Purchase an 8″-diameter Kaysun plastic prop; if not available, use the next size smaller prop. Bend a piece of .045 wire to the shape shown in the plan. Be sure to bend the rubber hook, first, then put the wire through the nose block and add two washers. Finish the prop shaft by putting the prop in place and bending the winding hook.

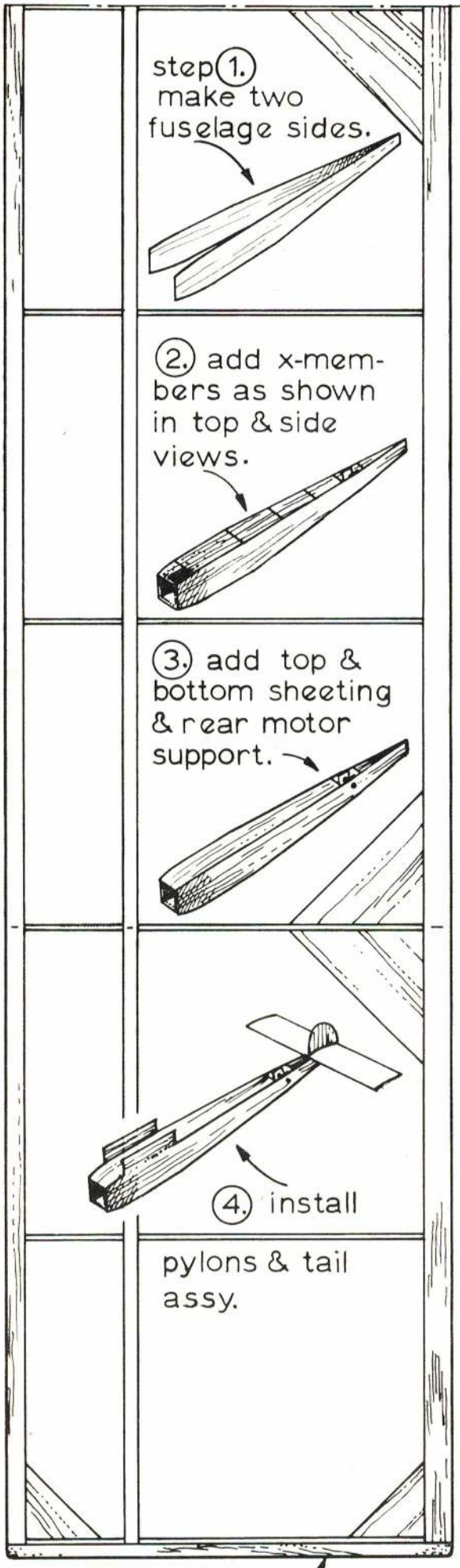
Make up a motor of ¼″ flat rubber, four strands about 12″ long. Wash the motor, then lubricate with model rubber lubricant or a few drops of an oil base shampoo. Place the motor inside the body, hooking it to the rear peg and the prop shaft hook. Place the body on a round pencil on a flat surface, run the body back and forth over the pencil until the balance point is found; mark this spot on the body. Cut the plyons out of 1/8-sheet hard balsa, and be sure to make them with the front edge higher than the rear as shown on the plan (this will be 2 degrees positive incidence). Glue the pylons to the fuselage with their rear edges about 1″ behind the balance mark. Reinforce the pylon-body joints with extra glue and tissue paper. The Backyard Flyer is now completed and ready for its first flight.

Hold the wing on the pylons with rubber bands, but not too tight. If the bands are too tight, the wing may be damaged on hard landings; the wing must be able to shift somewhat on impact.

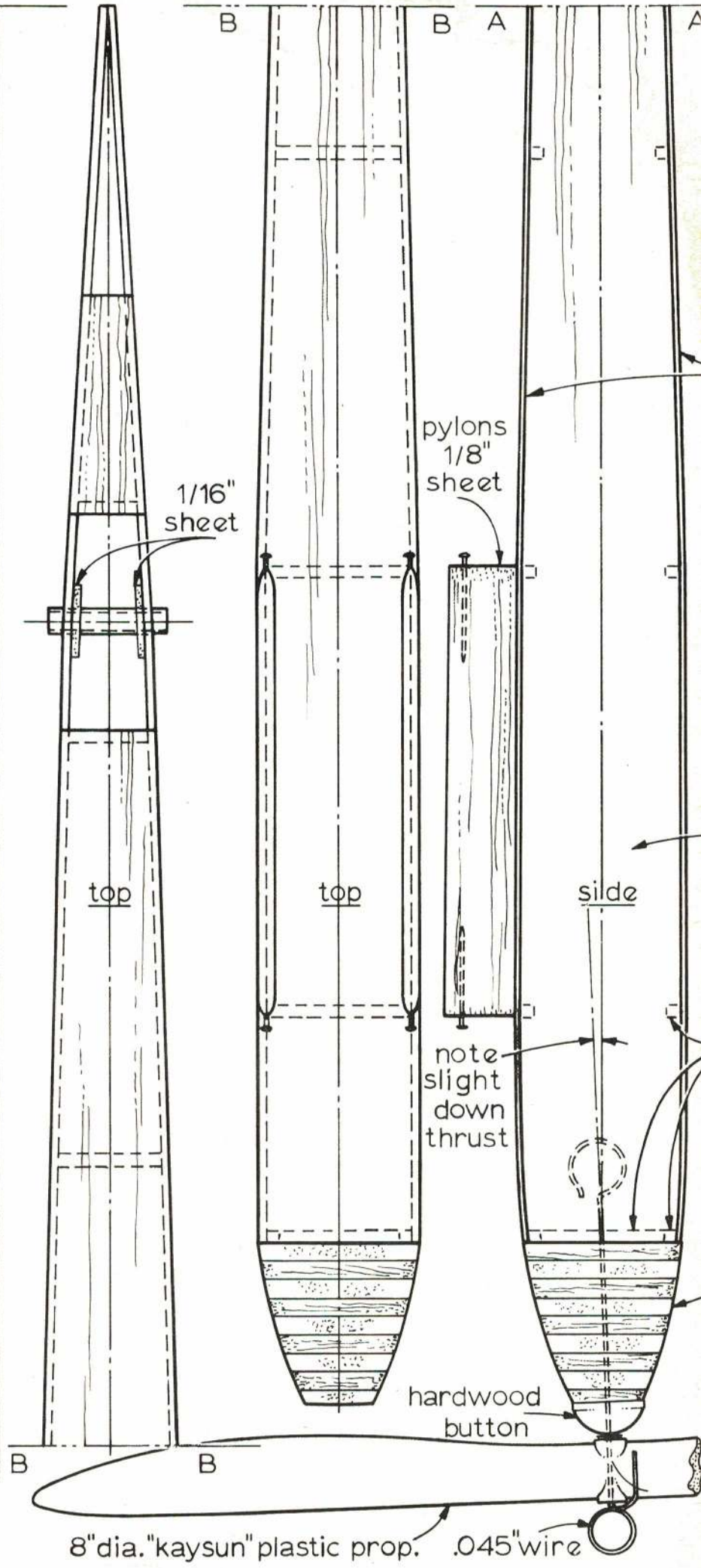
Hand-glide the model over tall grass. If the model tends to stall, add a shim, about 1/32 thick, under the wing at the rear of each pylon. But if the model dives, add small shims to the front of the pylons. However, don't expect a real floating glide from such a small model with a large prop. After the model hand-glides O.K., wind up the motor about 50 turns by hand, and launch with the nose slightly up and the right wing a little low.

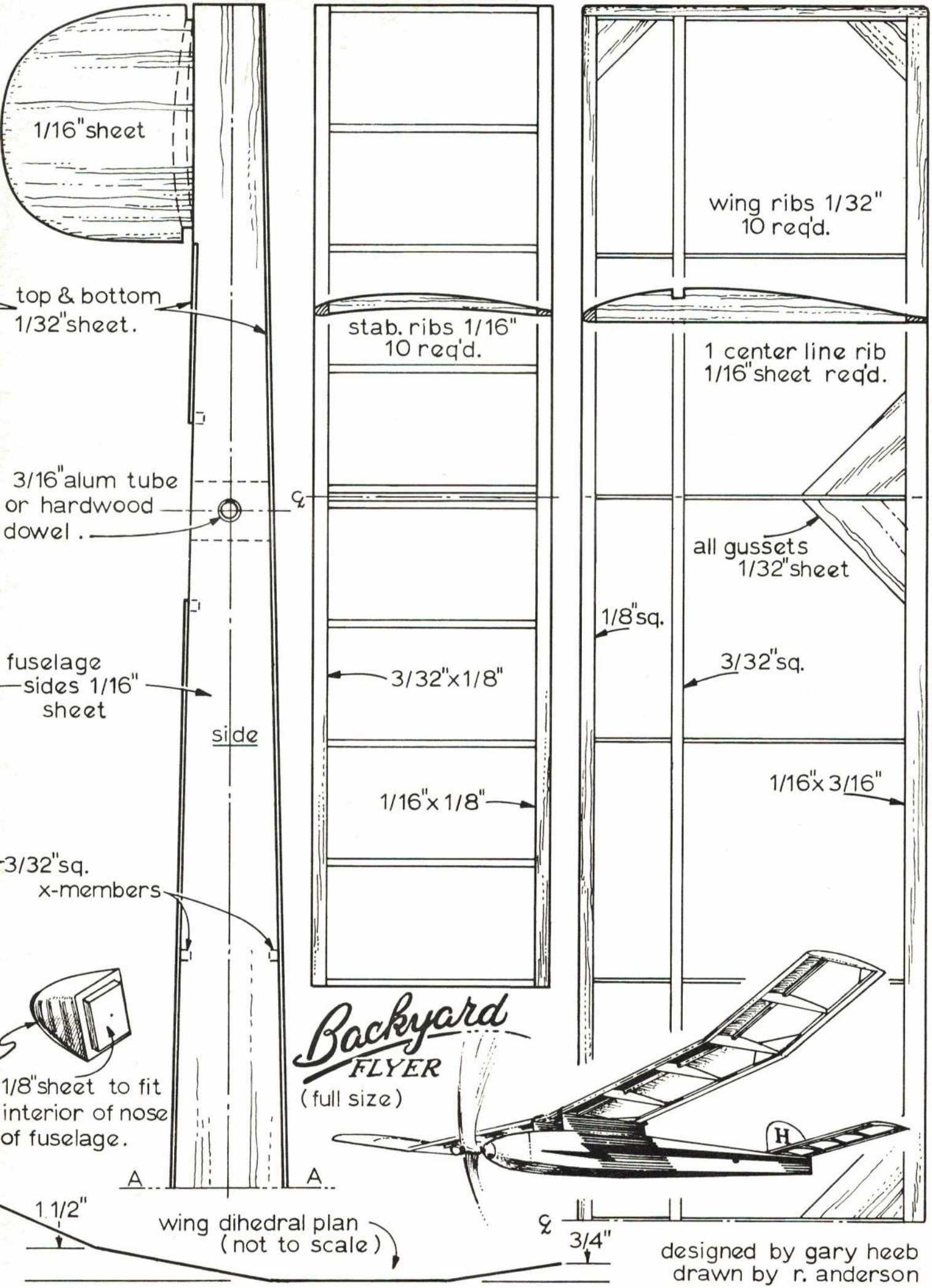
The model should climb in a wide right turn. To make the model go right, which is the best and safest direction to climb, right-thrust or right-rudder tab may be used. To make right-thrust, add a small shim under the left side of the nose block so that the prop will pull toward the right. This will affect climb only. A tab cut in the rudder and bent right will cause both right-climb and -glide. If the model needs any of these adjustments, make them before the next flight, but only one at a time. After a good flight on 50 winds, add about 40 winds for the next test flight. My model

Continued on page 69


step (1.) make two fuselage sides.
(2.) add x-members as shown in top & side views.
(3.) add top & bottom sheeting & rear motor support.
(4.) install pylons & tail assy.
wing tip 3/32" sheet

12-'68


B
B
A
A
1/16" sheet
pylons 1/8" sheet
top
top
side
note slight down thrust
hardwood button
B
B
8" dia. "kaysun" plastic prop.
.045" wire


1/16" sheet
top & bottom 1/32" sheet.
3/16" alum tube or hardwood dowel.
fuselage sides 1/16" sheet
side
3/32" sq. x-members
1/8" sheet to fit interior of nose of fuselage.
A
A
1 1/2"
wing dihedral plan (not to scale)
stab. ribs 1/16" 10 req'd.
3/32" x 1/8"
1/16" x 1/8"
wing ribs 1/32" 10 req'd.
1 center line rib 1/16" sheet req'd.
all gussets 1/32" sheet
1/8" sq.
3/32" sq.
1/16" x 3/16"
Backyard FLYER
(full size)
H
3/4"
designed by gary heeb
drawn by r. anderson

Brig. Gen. Robert F. King addressing members of the Washington State Aerospace Education Advisory Committee. Left, Col. Lyle Scott, 142nd Air Defense Wing.

On right of highway is the site of Camp Murray. All this area will be developed for model planes, boats, and cars. Buildings will be used for classroom work.

MODELERS' PARADISE

ACADEMY FOR AEROSPACE

At Camp Murray, Washington, the Air National Guard, with help from the Governor, educational people, and prominent organizations, is on the way to a million-dollar-plus modeling facility which has important national implications.

DALE G. BAILEY

Editor's Note: Mr. Bailey is employed as Director of Public Relations at the University of Puget Sound. After graduating from that institution in 1956, he was a USAF jet pilot, served in Alaska, and later returned to the public relations field as a civilian. He currently holds the rank of Major in the Washington Air National Guard, assigned as Information Officer at the State Headquarters near Tacoma.

IF there is ever to be a modeler's paradise, a Shangri-La where the science of modeling is fully appreciated, it probably has its best chance here in the Pacific Northwest where the Washingtoin National Guard is waging a vigorous campaign to establish an Academy for Aerospace Science and Modeling. This kind of effort from an organization with no special ties to modeling is certainly a first and the impact of this objective approach makes our campaign even more dramatic.

It all began when an editorial in American Aircraft Modeler came to the attention of Brig. Gen. Robert F. King, Assistant Adjutant General for Air at Camp Murray, Tacoma, Wash. Camp Murray is our Headquarters for both Air and Army National Guardsmen of Washington. The editorial was concerned about the reluctance of the Navy to continue annual competition for young modelers. (Navy was encouraged by the 1968 Nats. — Editor.) The problem was, and is, that a program designed for youngsters was reaching too few of the younger set. General King, who heads the Washington Air National Guard, was distressed that such a fine program was in jeopardy and decided to launch a study of modeling, including a careful analysis of the educational potentials.

The National Guard has historically related to youth and so it's not surprising that General King would take this interest in modeling. Just last summer, the Guard cosponsored a youth camp at Camp Murray which includes beautiful camping facilities right on American Lake. Over 2,000 underprivileged children enjoyed the summer months here and it became apparent what an ideal location this might be for other youth activities and — yes, even an Academy for Aerospace Science and Modeling.

To detail all the contacts and research we needed before we could speak intelligently about modeling would take a book, but we do want to mention some of the people and organizations who responded to our queries because we have never experienced such marvelous cooperation. On the federal level, NASA's Dr. Fred Tuttle gave immediate and important support to our investigation. Other agencies with whom we are working include the National Science Foundation, the Office of Equal Opportunity and the U. S. Office of Education. In our own state we take our hats off to our Governor, Daniel J. Evans, who gave our early campaign impetus and continues to provide leadership. Representative Robert F. Goldsworthy has sponsored two bills necessary for our Academy plans. Ron Pretti, Director of the Washington State Aeronautics Commission, is on our team, and so are the Departments of Public Assistance, Natural Resources and Parks and Recreation. Dr. Ralph Brooke and Bill Kempton rolled up their sleeves for us, representing local model clubs, as did the AMA Executive Director, John Worth, and past AMA president Cliff Weirick. And what tremendous assistance we have gained from manufacturers like Phil Kraft, Carl Goldberg, Revell's Lewis Glaser and Sterling's Ed Manulkin.

From the field of education came the most dramatic and exciting discoveries from men like Dr. J. Wesley Crum, President of the National Aerospace and Education Council; Louis Bruno, Superintendent for Public Instruction; and other prominent educators in Washington State helped, including Jim Garner, Roy Duncan, William Shelley, Lee Fisher, Dr. Herb Taylor, James Robertson and Dr. Fred Miner.

The Guard's most striking discovery about modeling, as we began our study, was the peripheral benefits, other than the obvious fun of modeling. It seemed that wherever we turned for information, we found a need which modeling could satisfy in our state. Far and away the most important potential of modeling lies within the field of education. In our opinion, here is a field where modeling should be melded right with the curriculum, as an integral part of the educational system, like shop, like music, like debate, like football, like all those extra curricular activities that add so much to the total experience of a youngtser. Aerospace studies, for example, in its infancy in Washington, is groping for better educational facilities and methods of teaching. What better approach to learning and the reten-

Dr. R. Franklin Thompson, Pres. of University of Puget Sound, Tacoma, receives briefing on the Academy from Maj. Mitchell Lundquist, Washington ANG, and author Dale Bailey. Concept is $1,500,000 project.

Mr. Jim Garner, State Department of Public Instruction, introduces guests at meeting held to evaluate Academy proposal. Dr. Fred Tuttle from NASA, on left. June will be Modeler's Month in Washington State.

SCIENCE AND MODELING

tion of that knowledge than through modeling.

Tacoma and Seattle, like other cities across our nation, are urban boiling pots with all the frustrations and delinquency problems so related. What better use of a young man's street-corner time than modeling. There is no one answer to the frustrations of youth, of course, as there is no one reason for them, but we know what this new generation is saying and it's time we began listening. They are asking us to make their lives more meaningful — they want their studies more relevant, more timely. Modeling, to a degree, presents potential for some of these problems, not to mention the kind of patience a youngster must develop to be a good modeler and a good citizen.

And in the schoolroom, modeling need not be restricted in its use to only building the standard types of models. Educationally, modeling would include modeling aids for all disciplines. A youngster builds a model of the larynx to understand speech, a model of the heart to understand a phase of biology, a model radio to understand electronics, but for the greatest and most rewarding thrill of all, youngsters should be encouraged to build and compete with their models in school the same way they are encouraged to compete in baseball and hopscotch. Everything is there to learn: development of self-esteem, competitive spirit, pride of ownership, and *they can learn while having some fun too.*

So with the evidence pointing encouragingly toward further involvement, General King began looking with renewed interest at Camp Murray's 250 acres early last summer. He conferred with his superior Maj. Gen. Howard S. McGee, the Adjutant General and Commander of the Washington National Guard, about the possibility of converting some of the state-owned land into an educational and modeling facility. General McGee obtained the endorsement of the Governor, provided that resources could be developed to finish the project.

With enthusiastic support from these quarters, a basic concept was developed. Still only an idea, the dream included a combination modeling facility and academy. In addition to officially recognized facilities for model aircraft, cars, boats and rocketry, the complex would also provide a building of 24,000 square feet to be used by the school systems of Washington, and as a seminar facility for teacher education in Aerospace Education.

Cliff Weirick, then Academy of Model Aeronautics president, with Phil Kraft, World Champion in radio control flying, look over some of the 250 acres for the proposed Academy with Brig. Gen. King.

State Representative Robert Goldsworthy and Maj. Gen. Howard S. McGee, Adjutant General and Commander of Washington National Guard, discuss converting state-owned land into facility.

The first major step toward establishing the Academy was taken last August when modelers from all over the Pacific Northwest joined prominent educators in a special seminar hosted by the Guard and held right on the site where the Academy would hopefully be built. I must emphasize here that the National Guard did not consider itself qualified to forge ahead with only limited knowledge in the field. As General King recalls: "Sure, we had an idea, and we thought it was a great one, but we needed an honest evaluation by people who would know the educational and modeling answers and we also needed a blue-print to follow. It has never been our intention to go it on our own. If this program is successful, it will be because educators, modelers, and many others want it to succeed. The Guard will help, of course, a role we like and do well with."

The workshop was probably one of the most historic moments in the life of modeling. Modelers and educators rolled up their sleeves on common ground—discussed their differences, found their similarities of purpose. Before the seminar was finished, delegates had tramped every inch of Camp Murray, and begun specific designs and locations for a radio-control airport, control-line circles, boat and float-plane areas on the lake, and free-flight facilities along with locations for rocket launch-pads and model cars. But even more important significance came from the fact that every educator and modeler at the workshop honestly believes that the Washington State Academy for Aerospace Science and Modeling will be significant and worthwhile project for the State of Washington.

With this preliminary work completed, the Guard prepared a proposal including the rationale and the preliminary plans for circulation to other Northwest and National leaders who might lend advice and support to the program.

The Governor's office became active, through the efforts of David W. Peyton, Programs and Planning Assistant, seeking federal programs where funds might be available.

Sooner or later, with every great idea comes the realization that ideas come true only with real and concrete support. Nearly 1.5 million dollars will be needed to complete this project. The Guard recognizes the challenge this presents, but General King and his staff have attacked this aspect of the program with the same enthusiasm as the original concept. And remember, the State of Washington is ready to grant use of over a million dollars worth of property, a real head start in the fund-raising campaign.

This spring, with or without the money to begin construction on the Academy building, trees will begin to fall at Camp Murray and work will begin on modeling activities.

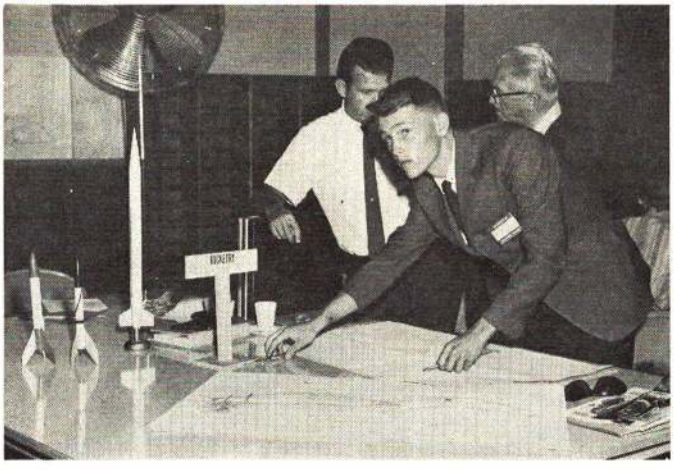
June will be Modeler's Month in Washington State and so designated by Governor Evans. The Air Guard, working with many model clubs in the State, will support a month-long series of model meets, demonstrations, and related events. The objectives of the June program are to arouse public interest in modeling, encourage youngsters to participate in wholesome and constructive activities such as modeling, to promote development of modeling as a recognized sport and as a worthwhile recreational and educational activity, and to establish support among youngsters, educators, modelers, civic groups, and people in business, industry, and government.

Modeler's Month will be kicked off on May 31, and June 1, in Spokane. Here the Air Guard's 142nd Air Defense Wing, commanded by Col. Lyle W. Scott, will host a two-day festival sponsored by the Flying Five R/C Club of Spokane. It will be "open house" at Colonel Scott's base with a balanced program designed to draw the greatest number of spectators for a delightful and beneficial exposure to modeling. Major Neil Udell, who is a jet fighter pilot for the Air Guard in Spokane and an avid modeler, will be contest director. He will be assisted by members of his own club and many others from Radio Aeromodelers of Seattle (RAMS), Seattle Radio Aero Club, and Mt. Rainier R/C Society.

The planned events include an exhibition hall where the many manufacturers of model products will display their merchandise. The meet will feature a full slate of pattern, pylon, and scale events with many R/C'ers from Canada and the United States, including Phil Kraft, Cliff Weirick, and Dr. Ralph Brooke vieing for 60 trophies to be awarded. An AMA-sanctioned R/C world's speed record event will be an added attraction. Static displays of military and civilian aircraft, both vintage and modern, will be shown along with plastic scale-model replicas and aviation memorabilia. A "Hall of Fame" banquet will be held the evening of May 31, the Air Guard's way of honoring the "great" names in modeling. AMA will recommend the names to be honored and each ensuing year new names will be added to the list. At the banquet we will also give appropriate recognition to contemporary modelers who have made significant contributions. This is definitely the year for you to plan your vacation in the Pacific Northwest.

Continued on page 63

Col. Guilmet, right, Washington CAP, and Maj. Lundquist, Washington ANG, admire model boats at Camp Murray Seminar.



Rocketry experts at Camp Murray Seminar design a space for their use at Academy. In background, Bill Wooley talks with Dr. Bob Gessel, State Rocketry Coordinator for Aeronautics Commission.

Major Neil Udell discusses with Phil Kraft plans for attempting world's speed record using aircraft he holds. An attempt will be made on June 1, at Air National Guard base in Spokane, Wash.

MOLD a fuselage

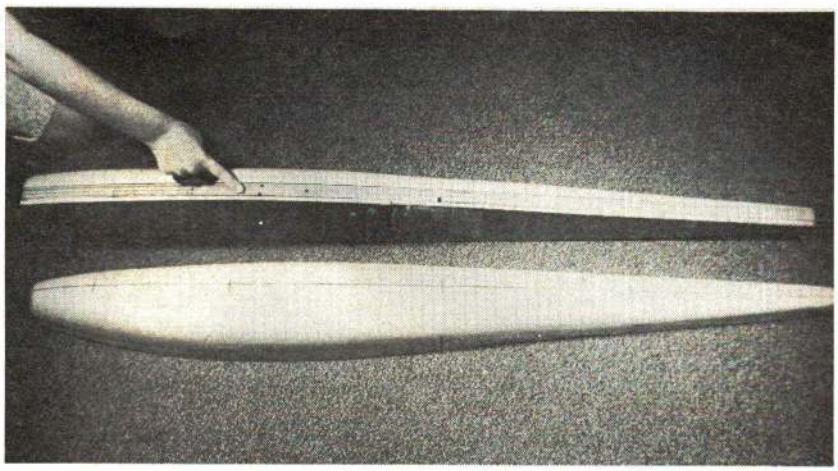


Fig. 1 Balsa is formed around this carved soft-pine mold which is painted to waterproof. Groove between pine and plywood is cutting guide for trimming the shaped balsa. Note reference line on mold.

Forming a sheet balsa fuselage is not difficult. Strength and beauty are the bonus results.

DALE ROOT

THIS article is for those who take pride in building and designing their own planes. You should find it an interesting and practical project.

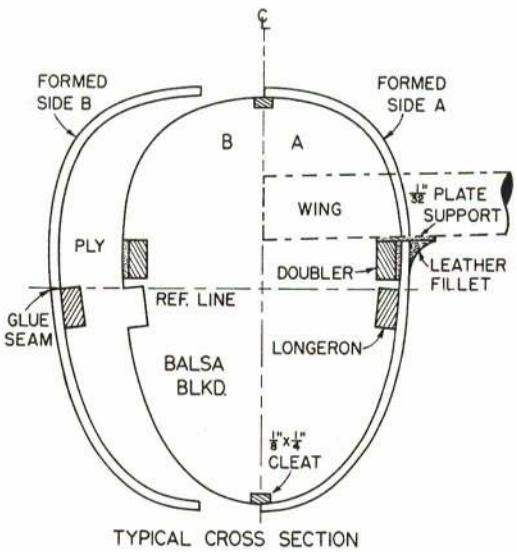
The monocoque fuselage, like that engineering marvel the eggshell, offers the best strength-to-weight ratio of any type of construction. A sheet balsa fuselage, formed with a rounded cross-section and compound curves and with only two to four external glue seams is strong and has pleasing appearance.

I have admired the formed balsa fuselages in the Top Flite kits. With the helpful advice of their Mr. Sid Axelrod, the method of forming balsa at home, covered in this article, was developed. (Commercial forming is done with a metal male and female mold.)

To accomplish this project, a wooden form, 2″ gauze, and a bathtub of water are needed. The forms in Fig. 1 are carved of white sugar pine (it carves like cheese). A right and left half are required. The "plugs" used for making fiberglass molds would work fine. Perhaps you could borrow some from a friend. The carved molds don't require a high finish, but should be waterproofed with resin, dope or paint.

Fastened to the back of molds is a ¾″ to 1″ plate of plywood or hardwood of the same outline shape. Fasten with woodscrews for later removal if desired. The backing plate serves the purpose of supporting the over-run of excess balsa during the forming process. It also provides a guide for cutting a true edge when removing the formed shell later on.

Fig. 2 shows the method of splicing two sheets of ⅛″ balsa together for a good seam. (If greater width is desired, thinner material can also be used.) The balsa should be of A-grain type from soft to medium-hard weight. Hard A-grain can be used if maximum strength with more weight is desired. (A-grain is the type that curls very easily.) Match the sheet edges that give a good fit, or cut with a straight edge. Lay flat and run masking tape over the joint. Turn over and fold the joint open (Fig. 2). Run a good coat of (waterproof) acetate cement down the groove, such as Ambroid,



TYPICAL CROSS SECTION

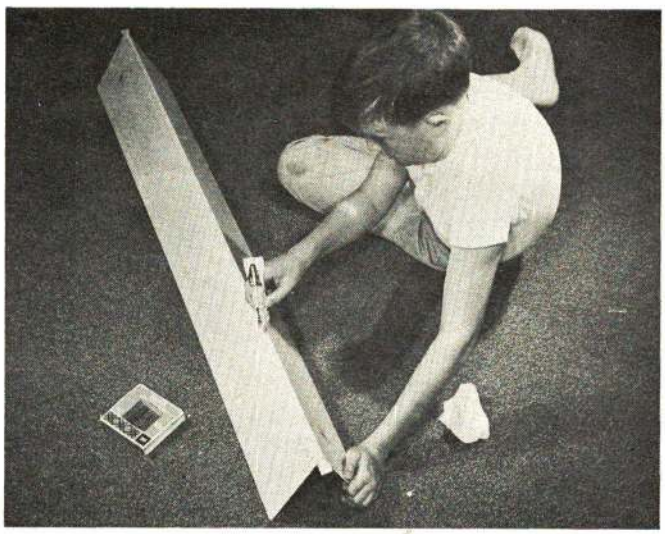


Fig. 2 Sheets of balsa must make a perfect full-length joint which is glued with acetate waterproof glue. This joint is reference line to center the balsa next on the mold.

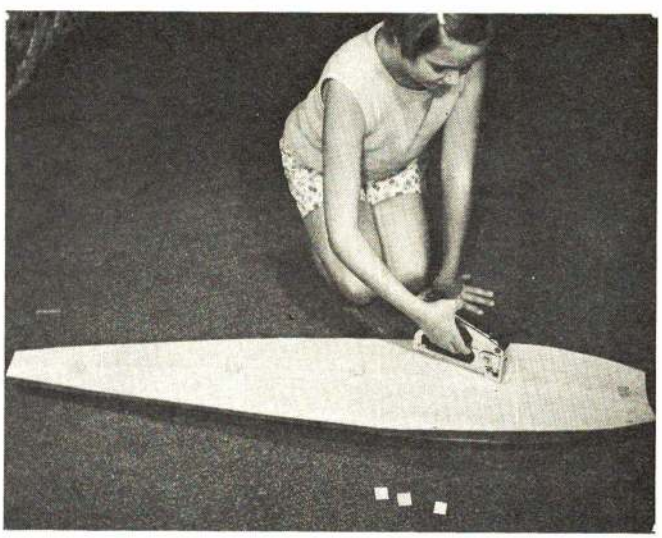


Fig. 3 With sheet cut to proper size and shape, soak for ½-hour then staple it along seam and reference line, using small plywood squares beneath staples to protect balsa.

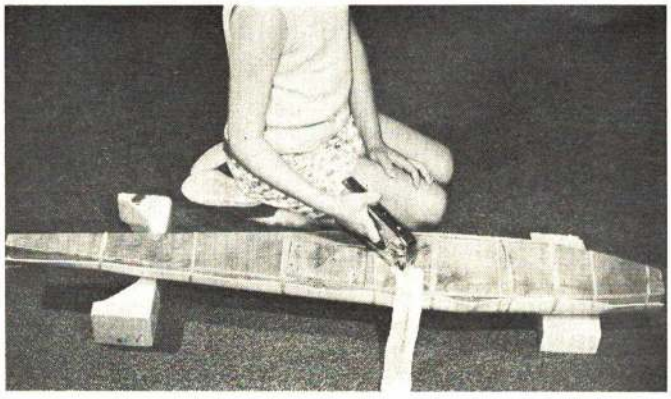


Fig. 4 Lightly rubber band the balsa around the form. Now start the gauze material from the center and start wrapping. Use two pieces, one going aft and one going forward.

Fig. 5 Keep the wrappings very tight, especially near the nose where the compound curving is greatest. Work out ridges in the balsa as best you can. Let it dry for a full day.

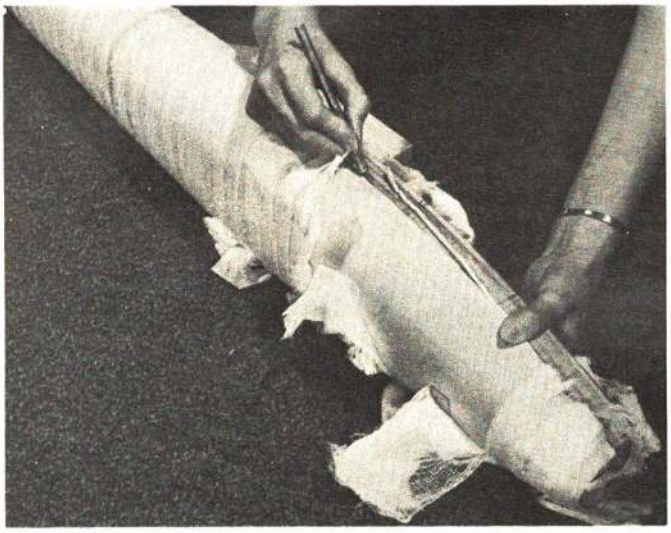


Fig. 6 The groove between the mold and plywood guides your sharp #11 X-acto blade as you cut the gauze, rubber bands and balsa. Final edge should require no trimming.

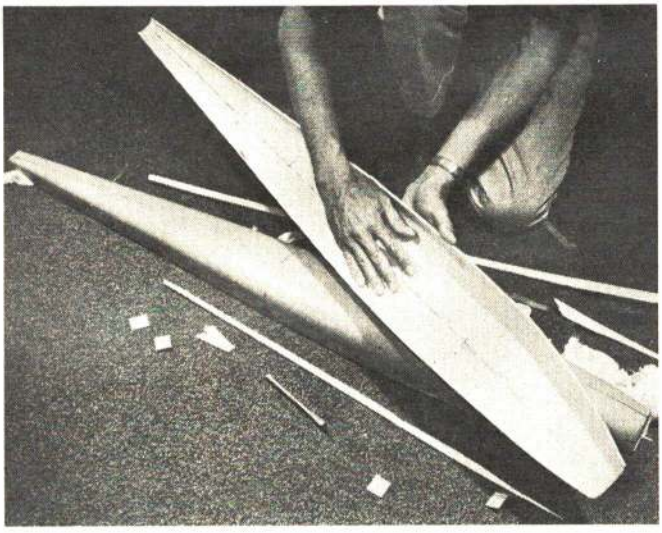


Fig. 7 Remove the staples and formed side is freed. You now can paint epoxy or resin into the nose section to fuel-proof and strengthen this area. It's ready for bulkheads.

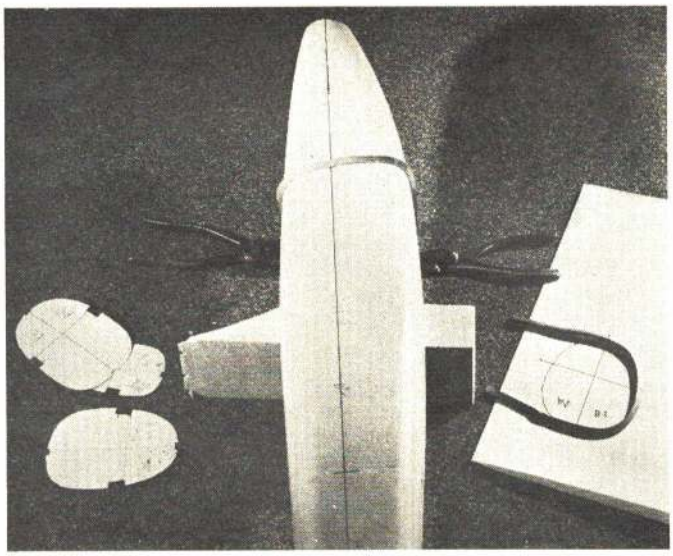


Fig. 8 Using plumber's "tri-solder," establish the shape of the curve for the bulkheads to fit inside the fuselage shell. Just bend the solder over the right place on the mold.

Fig. 9 Glue the side longerons over the seams. Glue bulkheads on one side with top and bottom longerons. Test fit the other side. The top and bottom lips provide good joining.

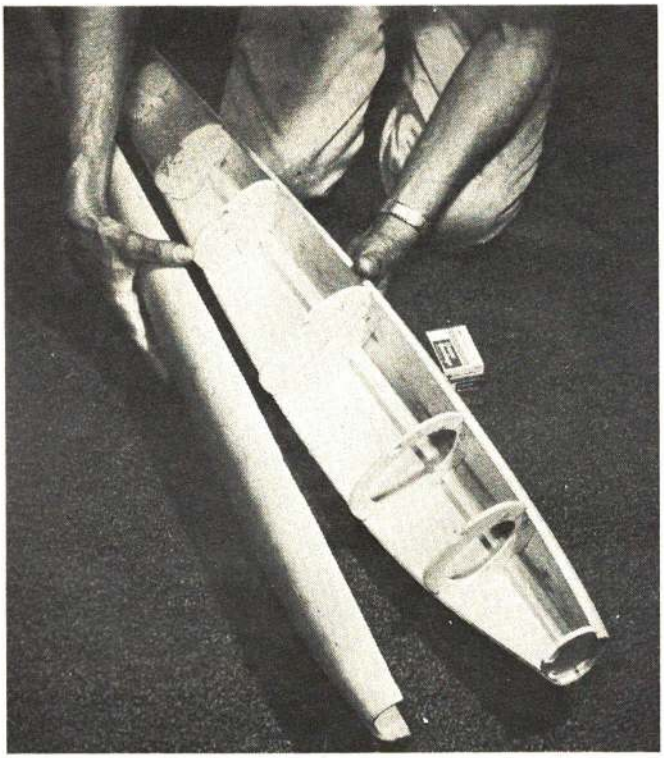


Fig. 10 Use a slow-drying and deep-soaking glue when joining sides. You must coat all longerons, bulkheads, etc. Pull the sides together carefully and apply tape across the seam.

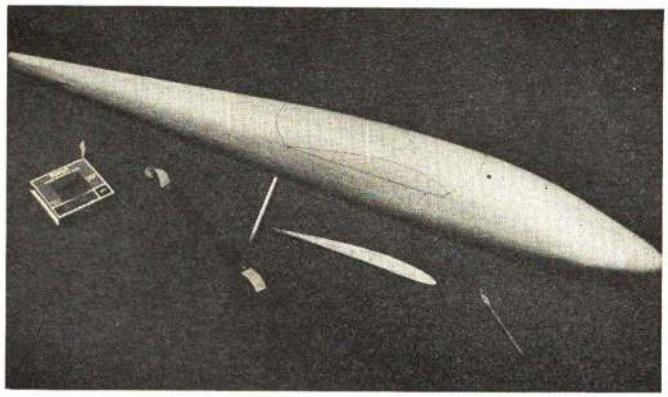


Fig. 11 The finished product ready for fittings. Use the side seams again as the reference line for positioning the wing mount and setting proper angles of incidence, thrust, etc.

Testors' or Root's. Lay the sheets down flat and wipe off the excess that oozes out. This glue joint seam is the reference line of the fuselage to be matched up later to the reference line on the form.

Use a piece of paper (butcher or wrapping) to make a template, holding it with tape. Fold over and around the form as best you can, with the paper wrinkles, and draw a pencil line about 3/8" to 1/2" larger than the top and bottom edges of the form. This allows for the balsa over-run. Mark the reference line with a straight edge. Cut the spliced balsa sheet from the template, matching the reference line with the glue seam.

Soak the balsa with hot water in the bathtub until thoroughly saturated (about 15 to 30 minutes).

As in Fig. 3, staple the sheet to the form in four or five places along the seam using 1/2" to 3/4" squares of 1/32" plywood to support the staple head. Line up the glue seam with the reference line.

To distribute the compression load of the balsa during forming, as a preliminary, pull the balsa down around the form in several spots with wide rubber bands or gauze. See Fig. 4. These are left in place during the wrapping process.

Start wrapping with ordinary 2" surgical gauze, (Fig. 4), by stapling one end to the backing plate. Wrap from the widest cross-section aft to the tail. (Fig. 5). Over-lap the gauze about 1" as you go. Pull the edges of the balsa down to the form and backing plate by wrapping as tightly as necessary. The ends of the roll of gauze are secured by stapling to the backing plate.

The greatest compound curve of this particular form is toward the front end and care should be used to distribute the compression of the balsa. Notice Fig. 5, by working the balsa down by hand and tightly spiral wrapping, with a wide gauze spacing, toward the nose, a major part of the problem is overcome. After this is done, a tight wrap can be continued from the aft wrapping forward to the nose. This completes the one side.

The opposite side is accomplished in the same manner and both sides put up to dry. A day of drying over the hot water heater or in a dry ventilated place is sufficient to thoroughly dry it out.

When removing your dry, shaped fuselage shell from the form (Fig. 6), a proper fitted and straight cut edge is obtained in one stroke. Very little, if any, sanding will be required later on. Use a sharp #11 X-acto blade knife. Run the knife joint into the crack between the backing plate and back of the form. By carefully running the knife along the form, in the crack, you can cut a nicely fitted edge on the balsa shell and cut the gauze at the same time. As you cut and the gauze falls away, hold the balsa edge down against the form with your hand to be sure of a true edge.

In Fig. 7 you have removed the staples and the balsa side is ready for the longerons and bulkheads. Several bulkheads should be used to give rigidity to the fuselage. I used about eight bulkheads. One at the nose, one fore and aft of the hatch for the wing, one between the nose and forward wing bulkhead, one below the center of the wing and three aft of the wing, one forward of the stab and two between, (note Fig. 9).

Duplicating the accurate shape for the bulkheads is done by using what is called "plumbers tri-solder." This is three-sided about 1/4" wide. Bend the solder over the form at the place for the bulkhead, (Fig. 8), pressing firmly to the form. Pull it up tight by using the pliers to "lever" the solder down tightly. Mark the reference line and edges of the form on the solder. Remove and trace on your template stock or bulkhead sheets. Mark two sides "A" and "B" and make a template measurement for each.

Good bulkhead material is made by cross-grain laminating (with Titebond or similar glue) two plys of 3/32" or 1/8" balsa. Make up some stock for this before cutting the bulkheads, using the scrap from the sides.

Notch the bulkheads to correspond to the four longerons to be cemented to the sides as in the "typical cross-section" drawing or Fig. 9. Note that the top and bottom 1/8 x 1/4" longerons when glued to the one shell, make a lip to support the edge of the other shell when mated and glued to it. I prefer the addition of the stronger side longerons

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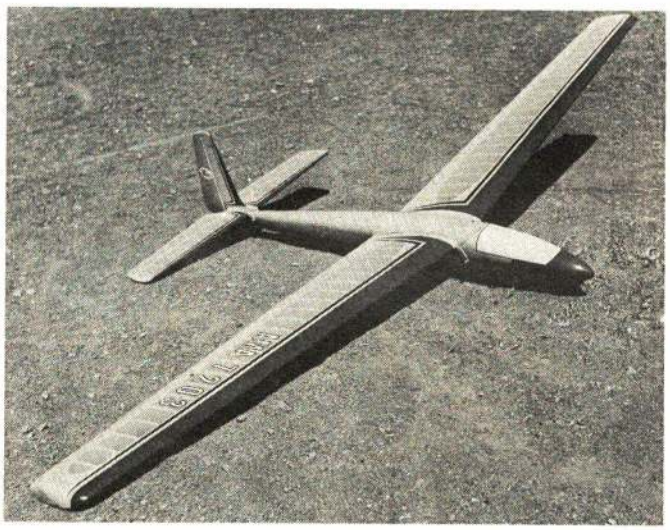


Fig. 12 This light-weight glider uses the fuselage just molded. However, any type of plane can use the method: free-flight, control-line, R/C power, and well-rounded scale ships.

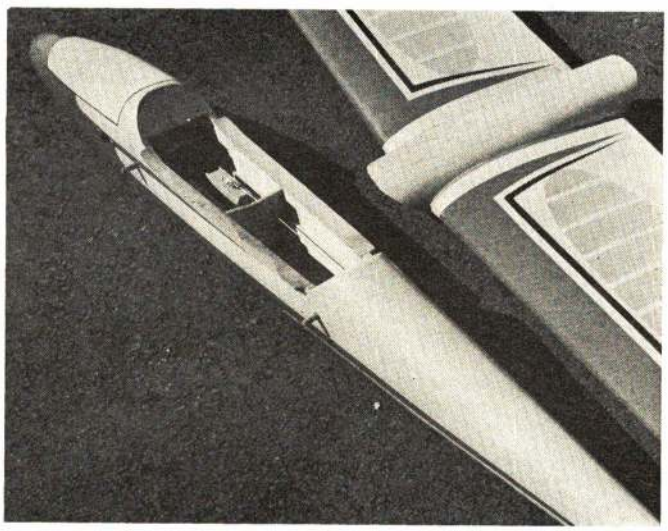
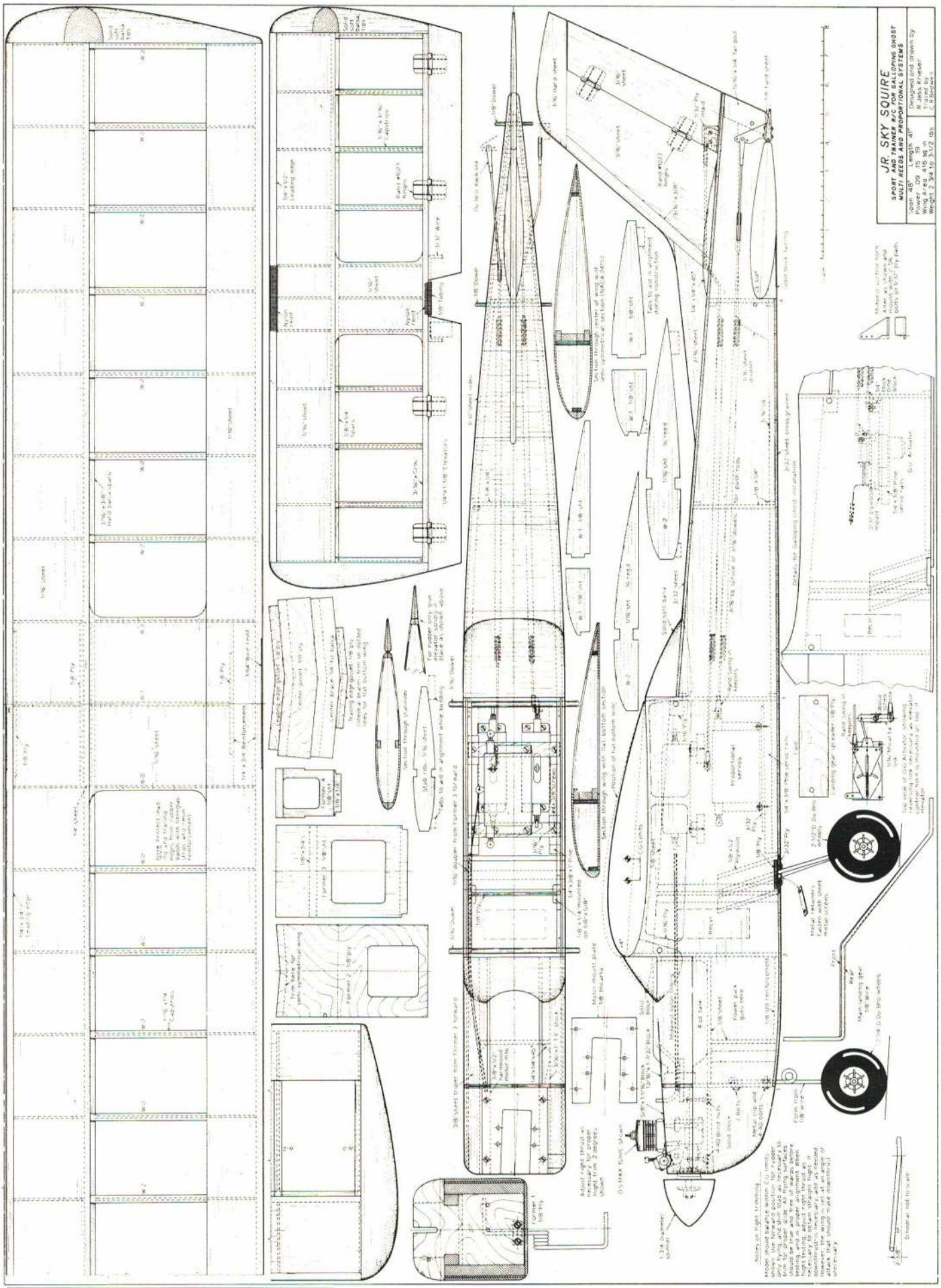


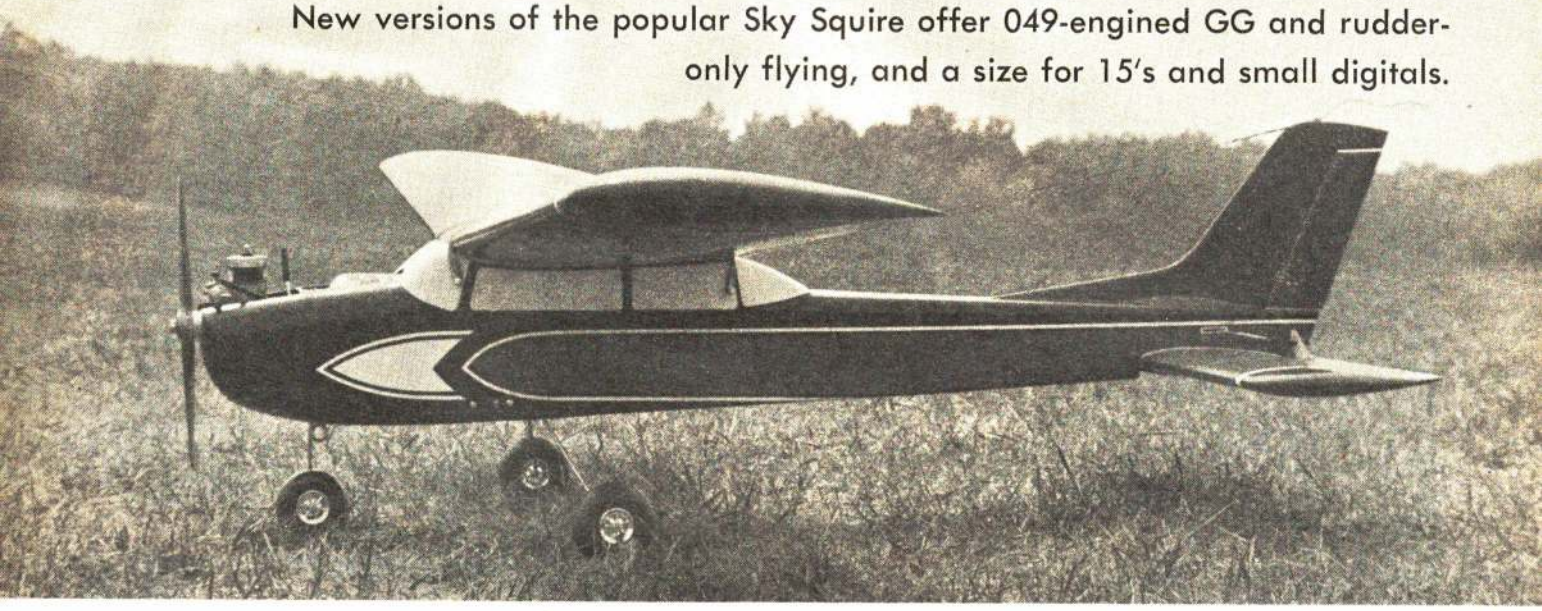
Fig. 13 Inside the fuselage you will discover another advantage of molded balsa fuselages — there's much more room. Also monocoque fuselages have strongest weight/strength ratio.



FULL SIZE PLANS AVAILABLE — SEE PAGE 60

Sky Squire Compacts

New versions of the popular Sky Squire offer 049-engined GG and rudder-only flying, and a size for 15's and small digitals.



R. JESS KRIESER

I have always been interested in the smaller-sized R/C ships, as they are much easier to transport in a car, build faster, and have lower inertia loads which enable them to take more pounding around from the goofs of pilot error without fatal damage to the structure. However, there was little in reliable lightweight, compact control equipment to give rudder, elevator, and motor control for a small ship until Herb Abrams came along with a simple, reliable Galloping Ghost actuator which did away with the complicated "bird cage" at the tail-end that always seemed to be a source of constant trouble. Later, the Dual-Pak system with twin actuators operated from a decoder offered even smoother, more reliable control of rudder, elevator, and throttle.

When these systems came along several years ago, it seemed natural to me to scale down the Sky Squire to fit these systems. I started out with the ½-A ship, for 049 to 09 size engines. By this time I had become somewhat of a convert to digital proportional, and I wanted another small edition of the Sky Squire with just enough room in it to pack in three channels of a digital system, so the Junior size version was born. This one offered more than enough room for the Galloping Ghost or Dual-Pak systems.

At the time these ships were developed, I had no idea that full-house digital systems would soon be reduced in size to 10- to 15-ounce systems. But since they have, both of these ships are right in the mainstream of the trend, and are ideal for the new compact digital systems, as well as GG and Dual-Pak systems. The new Controlaire system with 225 mah power pack and S-4 servos is ideal for either of these, and with a little extra work on the part of the builder, you can even go to ailerons on either of these ships.

However, it has been with the GG and Dual-Pak systems that these two ships have really proved themselves to date. A number have been built, with excellent flight reports. All flight characteristics that have made the big Sky Squire (now kitted by Midwest) so popular have been preserved. I designed this ship during my beginning days in R/C to satisfy my desire for a "lazy man's airplane," that would be tame enough to learn to fly on, yet rugged enough to survive the inevitable beating that a trainer must take. The Sky Squire fulfilled all my desires to the utmost, giving me a highly maneuverable, responsive airplane, yet tame enough and stable enough that when one got into trouble, you could simply throttle back and rely on the inherent stability of the ship to get you back on the right track. It has proved so stable that the original Sky Squire was landed on a number of occasions with the transmitter turned off!

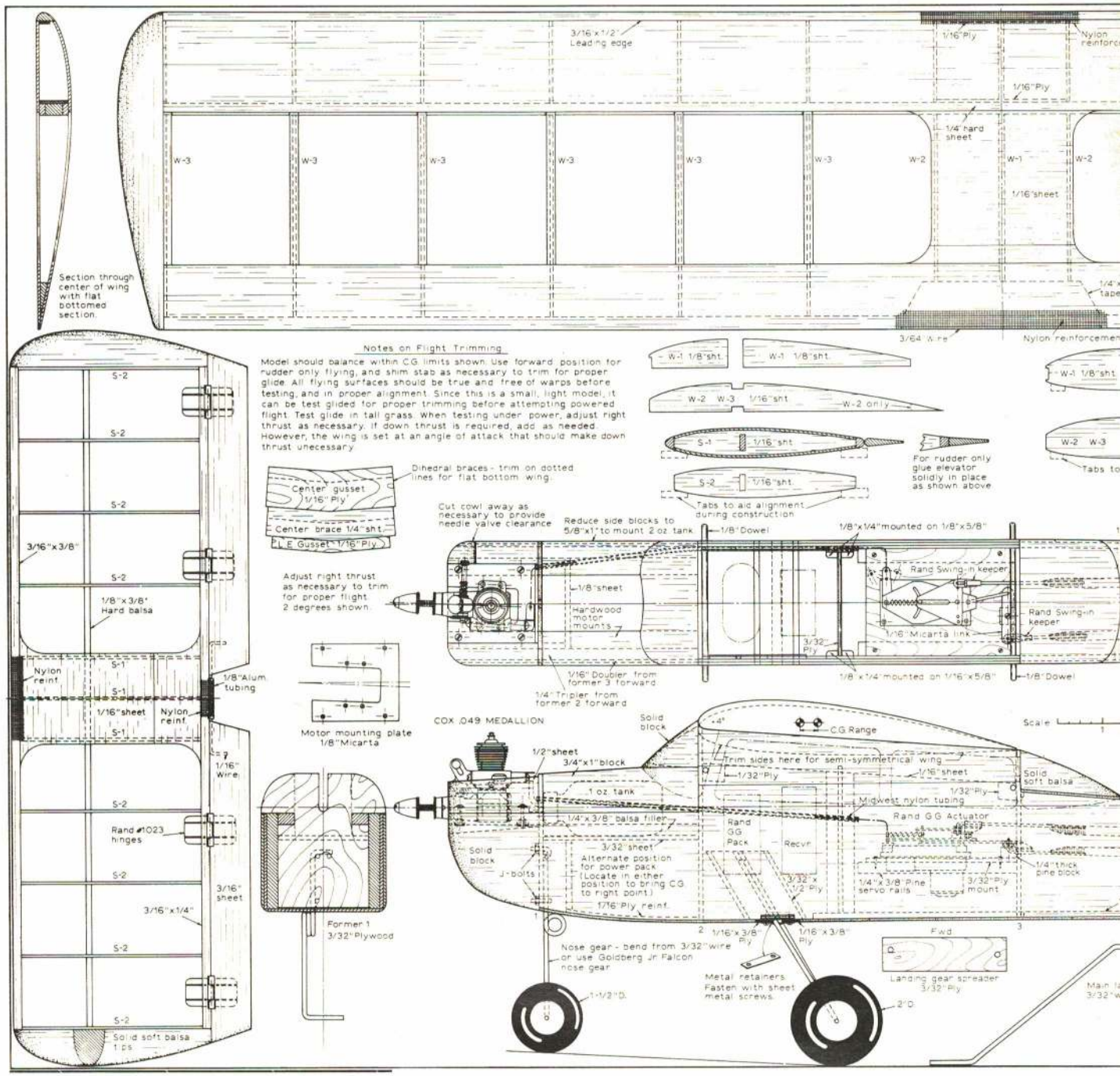
I flew the big Sky Squire for several years, going through four of them before working out the compact versions presented here. However, I never got to fly either the Junior or ½-A prototypes that I built, as Herb Abrams traded me out of them almost before the dope had dried!

It was Herb that really proved their performance with the GG and Dual-Pak systems. He came over one weekend with the ½-A ship that I had built, and shocked me with what he had done to it. He had stuck a Dual-Pak system in it, with an Enya 09 in the nose, bringing the all-up weight to over 2 lbs., which was about ½ lb. more than I thought practical for a ship with only 269 square inches of wing area. To make matters worse, the wind at our local flying field was so strong and gusty, that flyers with the 60-powered Taurus were staying on the ground.

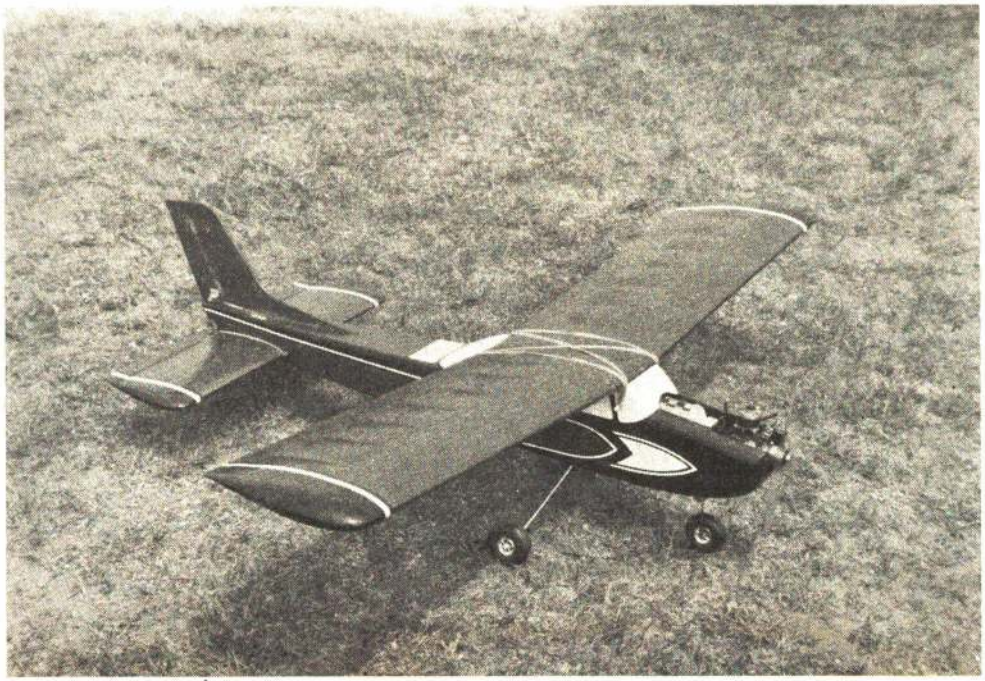
But not Herb! He came over to fly. He fueled up, started the engine, checked the system, and handed the ship to me to hand-launch. I tossed it, and up it went. Then he proceeded to stunt it all over the sky, like a big, hot competition ship, and like there was no wind. Next, he rolled it inverted and flew all around the field upside down. A couple of more flights with a repeat performance on each showed it was no fluke, and that the ship had power handling and penetration characteristics beyond what I had anticipated. At this point he turned over the transmitter to me, and I was quite pleasantly surprised to find that it seemed as smooth as the big one on Digital proportional, but with slightly faster response because of its smaller size.

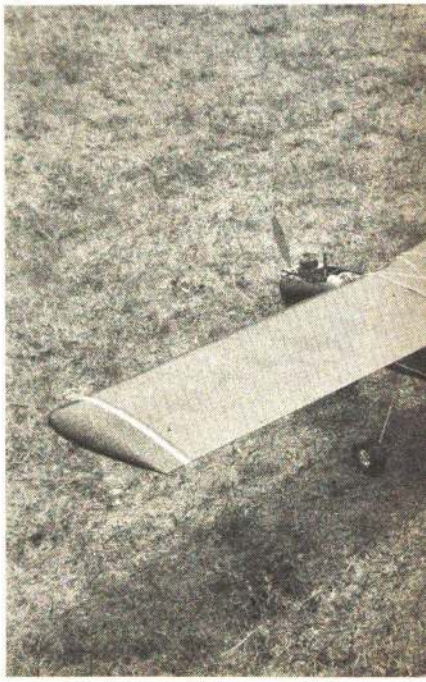
When Herb went back home he took the finished Junior size ship with him, and phoned me a short time later to report on the flight results. He liked this one even better than the ½-A ship. He particularly emphasized the fact that it was the first design that he has flown with his systems that is able to make rudder turns without correcting constantly with elevator to keep the nose from dropping. This was a characteristic that I found in the big ship, and when properly trimmed, it will make gentle rudder turns, even close to the ground without having to camp on the up elevator control to keep the ship in the glide slope. Herb also stated that this is the first ship that he's found which he feels he can use to teach his wife to fly without worrying about her getting rattled and nervous on the transmitter. Right now, the original Junior-size ship is being flown by Jim Northmore, on "loan" from Herb Abrams.

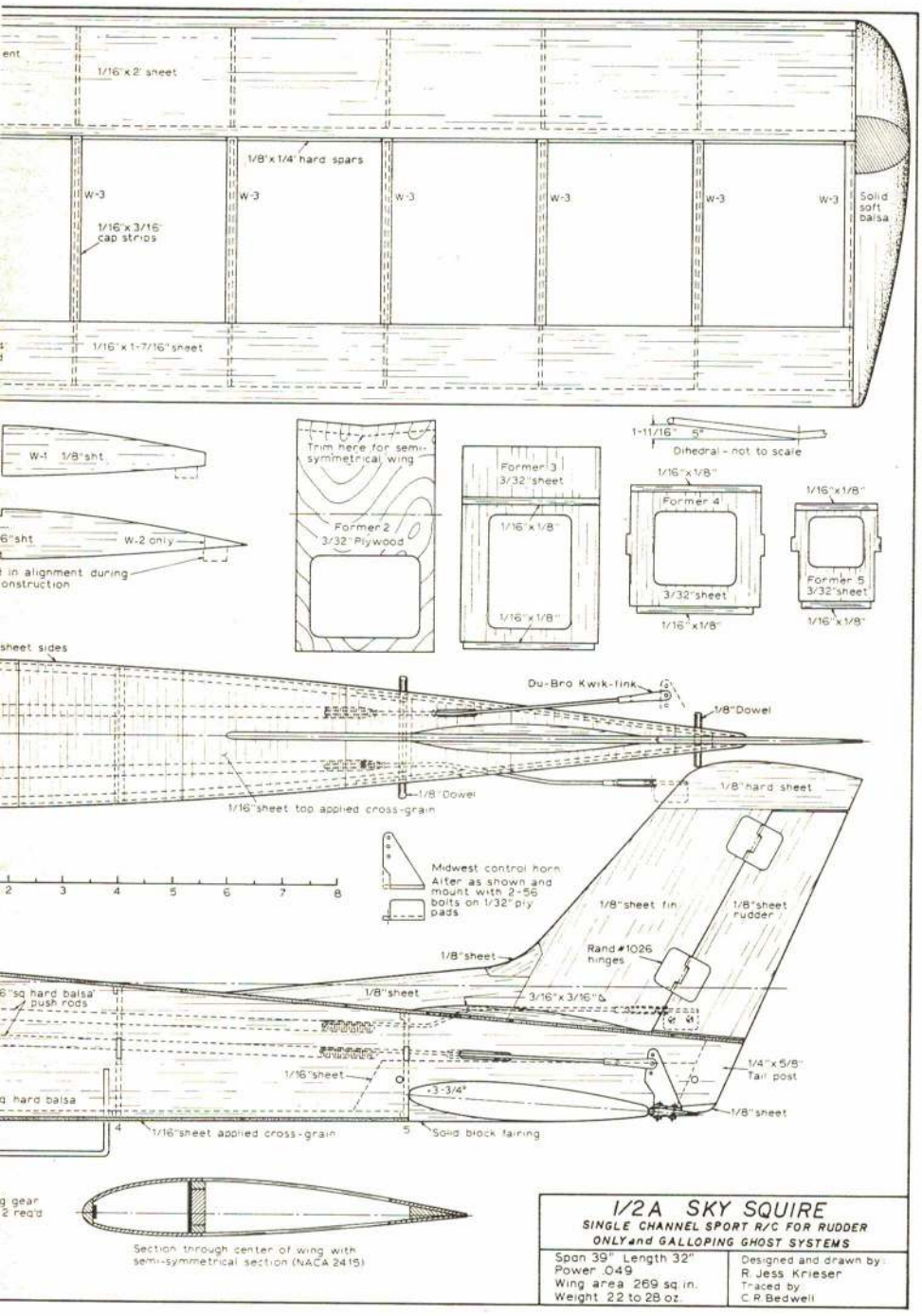
You can build either of these designs with your choice of a flat-bottomed or semi-symmetrical wing. Performance is similar with either wing, except that the flat-bottomed version will glide a bit slower, and is a bit gentler to handle on landing approaches. However, it won't do outside loops or inverted flight very well because of the abrupt change in lift coefficients resulting when a flat-bottomed section is turned into an inverted position. When flying with Galloping Ghost systems, the semi-symmetrical wing version is smoother to fly, as it does a better job of damping out the slight up and down movements that result from the "galloping" control surfaces. The flat bottom section produces larger changes in lift coefficients when the angle of attack is varied slightly, hence, tends to be more sensitive to the galloping effect of the control surfaces. This is not a characteristic of this particular design, but simply an aerodynamic fact of life, and is true with any Galloping Ghost ship utilizing a flat-bottomed section. Whichever wing you choose, you'll find this to be a real rewarding "fun" airplane to build and fly.

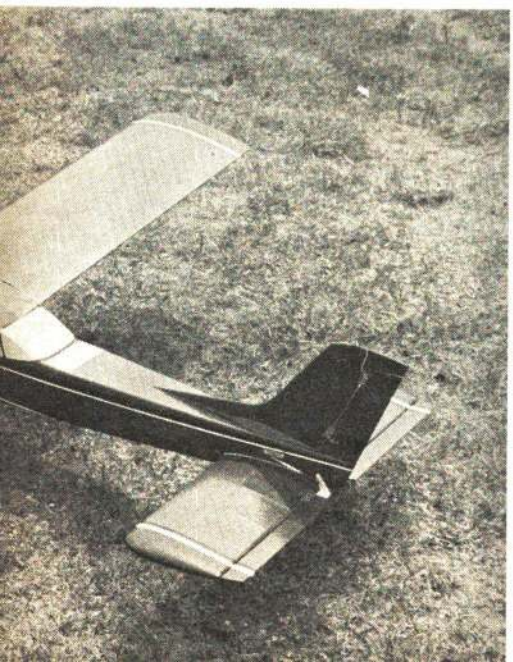


FULL SIZE PLANS AVAILABLE — SEE PAGE 60









Construction of both ships is very nearly identical, so the following instructions will apply to both. The only significant difference between the two ships is in the sizes of balsa used.

Wing: You can build either a flat-bottomed wing, or semi-symmetrical wing; ribs are shown for both. Tabs are shown on the semi-symmetrical section to aid in building on a flat board. You may either build the wing in two sections, joining it at final asembly and adding the plywood dihedral braces, or you can build it in one piece. If doing the latter, join two flat boards, blocking up the ends to form the proper dihedral angle shown on plans.

Squires are good trainers. The flat-bottom wing has lots of lift — especially when using three-servo control systems.

Semi-symmetrical wing best for Galloping Ghost as elevator pulses are smoothed out. This wing also is best for sport-stunting.

If building the flat-bottomed wing, start by cutting the leading edges and bottom sheeting to proper length and proper dihedral angles. Lay down the leading edge, then the leading edge sheeting, butt-gluing it to the leading edge. Next, lay down the bottom trailing edge sheeting, and bottom center-section sheeting, then glue the cap strips in position. Glue the spars in place on top of the sheeting, then install all ribs. Add the center-section spar filler, trailing edge reinforcements at center-section, and leading edge dihedral brace. Then install the top spars and the plywood dihedral brace, and you are ready to install all top sheeting and the cap strips. All that remains is to add the tip blocks after the assembly is dry and you have removed it from the building board. Final step is to carve and sand to final shape, and add the reinforcement to the center-section to prevent cutting into the wing by the hold-down rubber bands.

If building the semi-symmetrical wing, the procedure is slightly different, begin by laying down the lower spars, and glue all ribs in position. Next, add the leading edge and leading edge dihedral brace. This is followed by the center-section spar filler, top spars, and plywood dihedral brace. Then install the top sheeting at both the leading and trailing edges, add cap strips and center-section sheeting. When dry, remove from board, trim off the tabs on the bottom of the ribs, and install the leading edge sheeting on the bottom. While this is drying, install the trailing edge filler at the center-section, the trailing edge sheeting, bottom center-section sheeting, and cap strips. Complete by adding tip blocks, then carve and sand wing to final shape.

Stab: Ribs are cut with tabs to facilitate building on a flat board. Pin bottom spar in position, then glue all ribs in place. Add top spar, leading edge, and trailing edge spar. Next add sheeting and cap strips. When dry, remove from board, trim off tabs, and add bottom sheeting, cap strips, and tip blocks. Carve and sand to final shape. Cut and sand elevators to shape and hinge them after covering is completed.

Fuselage: Cut sides to shape from sheet balsa, and reinforce with doublers from former 3 forward. Add bottom longerons and stab-opening doubler. Add triplers extending from former 2 forward, and install plywood landing gear parts to inside of each fuselage side. While sides are drying, cut all formers to shape, using balsa or plywood as specified. Install hardwood engine bearers on fuselage sides before assembling, lining them up with the slots in the firewall. To assemble sides, pin in position over plans and glue formers 2 and 3 in place, squaring up as you do so. Since the bottom of the fuselage is a straight line from former 2 rearward, this simplifies alignment, as the whole assembly can be kept pinned in place over the plans. Shape the tail post, and install it, along with the remaining formers. While the assembly is still pinned down, add the top sheeting which will help lock the assembly into proper alignment.

After removing from board, install the plywood landing gear pieces on the bottom, and the pine servo mounting rails. Bending the main landing gear units at this time will enable you to use them to help in proper alignment of the bottom plywood landing gear mounting pieces. Next step is to sheet the bottom from the landing gear mount rearward.

Box off the fuel tank compartment with sheet balsa beneath the engine bearers, then reinforce the firewall mounting with pieces of trailing edge stock. Install the

Continued on page 64

SEMI-SCALE FOR CONTROL-LINE STUNT

Mustang

What's next in the scale trend? Try a competitive C/L stunter that still looks real!

WILLIAM A. RABE JR.

SIX years ago I worked for a company that converted war-weary, ex-Canadian 51's into fast executive aircraft. I ferried them to Florida, test flew and then demonstrated and delivered the conversions. Four years later, wanting to model the Mustang, I started a control-line version. Visions of the staggering, unstable flight typical of scale types, seemed an insult to the F-51 so it was never finished.

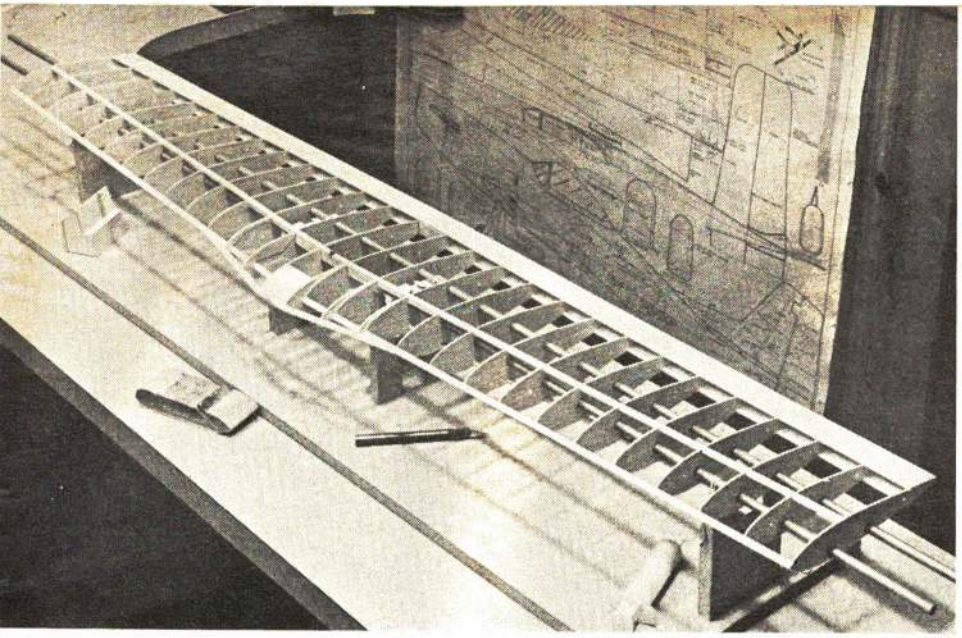
Then Bob McKinney, friend and Nats stunt finalist, asked me to design an F-51D stunt ship. Trying unsuccessfully to convince Bob that the F-51C would fly better because of the increased side area aft, I drew up the "D" in stunt configuration. It looked great, but there was still concern about the side area aft, so we shelved the plans.

For the next few weeks I thought about solutions to the problem of directional stability that might make the F-51D practical. The problem, simply stated, was that hard, outside corners cause loss of line tension due to an accompanying inward yaw. This yaw is more noticeable on ships with little side area aft of the CG. Coupling the rudder to the elevator might produce a compensating yaw on all pitching maneuvers. The next step was to try it out. A movable rudder was jury-rigged on a simple, straight-wing stunt ship called Oriental, designed by Dee Rice. It worked even better than I hoped, and this ship was used for several contest wins.

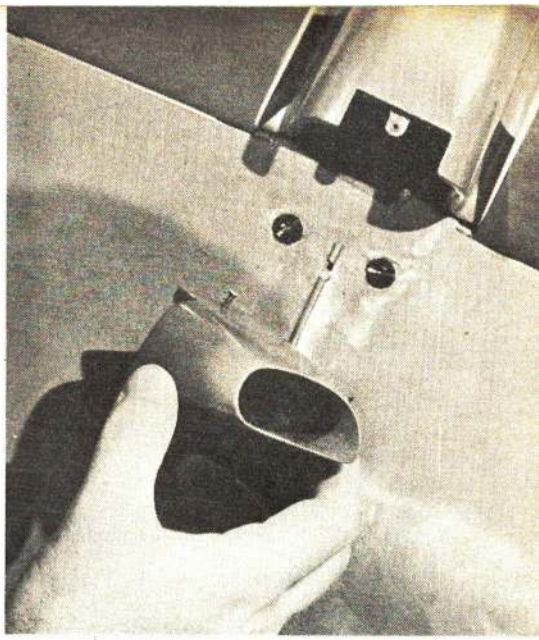
With the problem of directional stability licked, I decided to go ahead with the design and construction of an F-51D. I must have been a little light-headed with the successful movable rudder because it was decided to go all out and use a removable wing, dihedral, long scale landing gear, and an extremely large frontal area for maximum realism. Such ideas were relatively untried on competition stunters; a combination of these features in one stunt ship certainly sets it apart from the conventional.

Anyway, it worked. The Mustang qualified at the Nats, in a wind described as 15 kts. plus, on its 8th and 9th flights since new. On its 10th flight it was 5th in the finals' first round. Unfortunately, it was decided to throw out that round and refly the finals Wednesday. I had to leave the Nats and return home to fly a trip out of

With careful dimensioning author kept the classic Mustang lines and still developed a contest-caliber stunter. The 52-oz. plane is powered by S.T. 40, turning an 11-6 prop.



Unusual features of wing are its 2½-degrees dihedral for proper leadout positioning and scale appearance; and jig-built assembly (fully explained in text). The wing is removable from the fuselage, as in an R/C model. It is easily built and very strong.



Wing attachment is with two nylon bolts at the rear and ¼ in. dowels in front. Air scoop is removable for access to controls.

Dallas that same Wednesday night. So ended the Nats effort. Returning home, I found the engine in my ship had accidentally been "cooked" and hadn't been putting out full power, so George Aldrich's best McCoy 40 was borrowed right off his Duster (how's that for a friend?) to fly the Southwest Championships. On the F-51's 25th and 26th flights it posted both high-point patterns to win Open Stunt and the 27th flight took 4th in Open Scale (114 flight points) which also won the U-Control Championship trophy.

It hasn't all been roses, however. Any new stunt ship requires trimming to obtain top performance. My Mustang had a number of problems. First of all, it was difficult to land. It had a tendency to float just above the ground, frequently terminating with an abrupt center-section stall and, bang, right on the spinner! This condition improved with the addition of nose weight. Now the '51 has 4 ozs. in the nose and lands better than any conventional gear ship I've ever flown. Also, the Mustang grooves better now and still turns in the snappy class.

That center-section stall also was evident in the lower right triangle and hourglass corners. It became less noticeable as I added nose weight because precise control was improving. When I changed engines and tried a larger prop, the stalling tendency was virtually eliminated by the power increase. Now the ship seems to accelerate out of a hard corner with the controls neutralizing just before a stall occurs. This type of stall is normally associated with overweight but in this particular case I feel the culprit is the unusual laminar airfoil in the center-section. High point of the airfoil in that area is at 50%, moving to 25% at the tip. The plans show a conventional center-section airfoil with the maximum thickness at 35%. The tip section remains the same. This should completely eliminate the problem in future Mustangs.

Finally, the airplane wiggled in the corners. By adjusting the rudder offset and sensitivity I was able to maintain line tension, but it still wiggled. This was embarrassing; everyone around here knows that my rudder should stop that — if it works. I tried moving the leadouts back half an inch to the position shown on the plans. That fixed it. The wiggle is gone now and the '51 corners beautifully. With no wiggle in the corners three turns of rudder offset could be removed; the vertical eight improved through a reduction in drag. The airplane's performance is now fully competitive. The looks are extra.

My Mustang has more than twice the frontal area of a Nobler. Drag is increased, although it certainly isn't double that from a conventional stunter. While the Mustang size is typical for a 40-powered stunter, on this one you had better use an unusually good McCoy 40 or substitute a more powerful engine, such as the Super Tigre 40. Extra power is required not only to offset drag, but also to turn a larger-than-normal prop to get working blade area into undisturbed air (11-6 Rev-Up).

My engines are customized for better power and longer life by George Aldrich. If you use the S.T. 40, watch the tank location or give some thought to modifying the venturi and spraybar. An S.T. 40 spraybar is ⅜" higher than McCoy or Fox engines. Lastly, the extra drag seems to have a speed-stabilizing effect, retarding a speed build-up in consecutive downwind maneuvers. This makes the F-51D an excellent windy weather airplane.

Use of a movable rudder permits an original treatment of fuselage side area. In general, if you have too much side area, the ship will weathercock in the wind and lose line tension downwind. Too little side area shows up in the airplane yawing noticeably, particularly in square corners. This occurs because there is not enough stabilizing side area aft to effectively dampen gyroscopic precession of the propeller (see Netzeband, AAM Dec. 67). I personally use whatever amount looks best, and rely on my movable rudder to eliminate the gyroscopic yaw. On the F-51D the aft fuselage is scale except, the vertical fin and rudder had to be enlarged slightly and for appearance sake only. Due to their proximity to the oversized stabilizer it was necessary to keep the appearance of the tail group in balance.

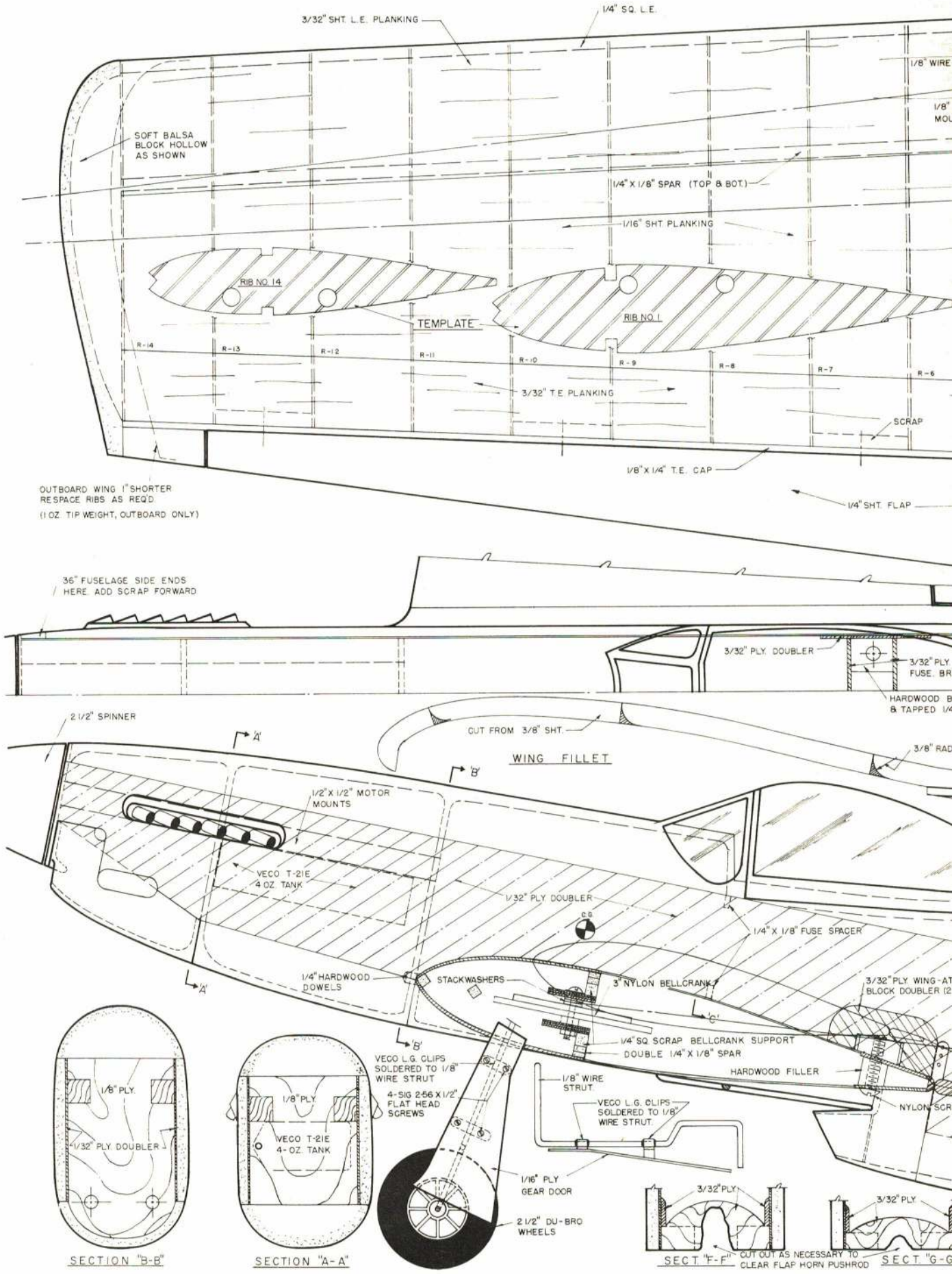
To make this ship look like an F-51 the wing had to go on the bottom and have dihedral. Due to fuselage effect, a low-wing airplane with a relatively deep nose will lose a couple of degrees of effective dihedral. By limiting dihedral to 2½ degrees, and placing the wing on the bottom of the fuselage, we not only have the aerodynamic equivalent of a straight mid-wing, but we also get the leadout location up around the vertical center of gravity. So the airplane flies level both upright and inverted.

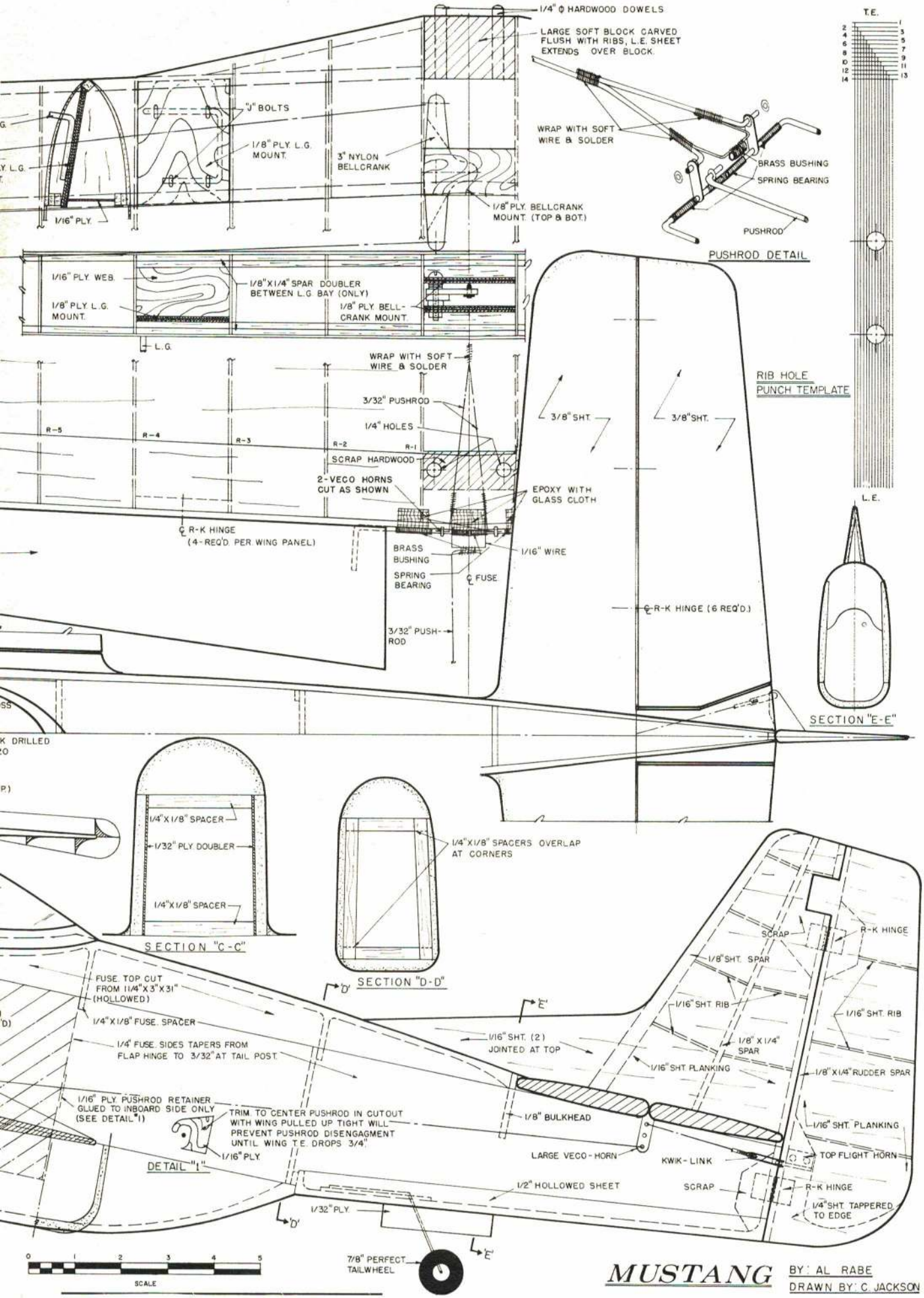
The removable wing is one of the features that really worked out well. It has been remarkably trouble-free. The R/C method of attachment with ¼" dowels and nylon screws has proven to be adequately strong, although I must admit this worried me at first, particularly in the strong wind at the Nats when the airplane was new. I half expected the wing to peel off on each outside corner. The only problem so far has been the tendency of the ¼" dowels to compress on the bottom. I noticed this first after about a hundred flights and fixed it by epoxying 9/32" rings of brass tubing over the dowels and reaming the mounting holes to match. A better solution would be to use larger dowels initially or add a ⅛" plywood doubler to the mounting hole area to provide more bearing area to distribute the load.

The flap-elevator pushrod has been completely satisfactory. The controls are extremely free and smooth. The elevator

Continued on page 50

That big trophy makes the model and flyer seem small. This plane is a consistent winner, especially at windy-weather contests.


3/32" SHT. L.E. PLANKING
1/4" SQ. L.E.
1/8" WIRE
SOFT BALSA BLOCK HOLLOW AS SHOWN
1/4" X 1/8" SPAR (TOP & BOT.)
1/16" SHT. PLANKING
RIB NO. 14
TEMPLATE
RIB NO. 1
R-14
R-13
R-12
R-11
R-10
R-9
R-8
R-7
R-6
3/32" T.E. PLANKING
SCRAP
1/8" X 1/4" T.E. CAP
OUTBOARD WING 1" SHORTER RESPACE RIBS AS REQ'D.
(1 OZ. TIP WEIGHT, OUTBOARD ONLY)
1/4" SHT. FLAP
36" FUSELAGE SIDE ENDS HERE. ADD SCRAP FORWARD
3/32" PLY. DOUBLER
3/32" PLY
FUSE. BR
HARDWOOD B
& TAPPED 1/4
2 1/2" SPINNER
CUT FROM 3/8" SHT.
WING FILLET
3/8" RAD
'A'
'B'
1/2" X 1/2" MOTOR MOUNTS
VECO T-21E 4 OZ. TANK
1/32" PLY DOUBLER
C.G.
1/4" X 1/8" FUSE SPACER
1/4" HARDWOOD DOWELS
STACKWASHERS
3" NYLON BELLCRANK
3/32" PLY WING-AT
BLOCK DOUBLER (2
'C'
1/4" SQ. SCRAP BELLCRANK SUPPORT
DOUBLE 1/4" X 1/8" SPAR
HARDWOOD FILLER
1/8" WIRE STRUT
VECO L.G. CLIPS SOLDERED TO 1/8" WIRE STRUT
NYLON SCR
VECO L.G. CLIPS SOLDERED TO 1/8" WIRE STRUT
4-SIG 2-56 X 1/2" FLAT HEAD SCREWS
1/16" PLY GEAR DOOR
2 1/2" DU-BRO WHEELS
1/8" PLY
1/32" PLY DOUBLER
SECTION "B-B"
1/8" PLY
VECO T-21E 4-OZ. TANK
SECTION "A-A"
3/32" PLY
3/32" PLY
SECT. "F-F"
CUT OUT AS NECESSARY TO CLEAR FLAP HORN PUSHROD
SECT. "G-G



MUSTANG

BY: AL RABE
DRAWN BY: C. JACKSON

FULL SIZE PLANS AVAILABLE — SEE PAGE 60

RADIO CONTROL WORLD

A ROUNDUP OF LATEST NEWS

CONDUCTED BY HOWARD MC ENTEE

Paul Sherlock's second big commercial-jet-type model is the BOAC VC10. Real plane has four rear-mounted fan-jets. Two enclosed R/C 60's. Span is around 6 ft., weight 8 lbs.

Technical Notes

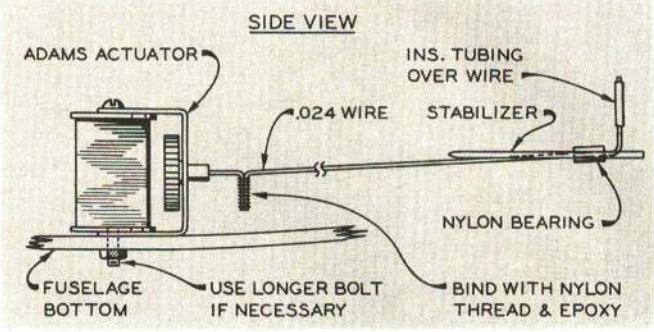
Small gliders: After building one 7-ft. glider and watching even larger ones fly, Ted Off (2365 E. Main St., Ventura, Calif. 93003) decided smaller ones might be just as interesting. He tried a couple with 200 sq. in. area, then built a scale Kirby Cadet with 30-in. span and 100 sq. inches. Ted feels it is about as small as practical with a super-het receiver. It carries a Controlaire double-ended het, two 225-ma nickel-cad buttons and an Adams Baby actuator. Total flying weight is 5 oz. This glider has no thermal soaring capability. Ted thinks that 200 sq. in. area would be needed for such use, with present equipment.

The Cadet has a very wide-chord rudder, making normal linkage impractical. The actuator was mounted on a ply strip which also supports the housing for the single landing wheel. The torque rod is .024" music wire. In our sketch the torque rod engages the rudder loop *ahead* of the rudder and fin. The torque rod should be in exact line with the actuator shaft to avoid binding. The thin-wire linkage ahead of the rudder is hardly noticeable.

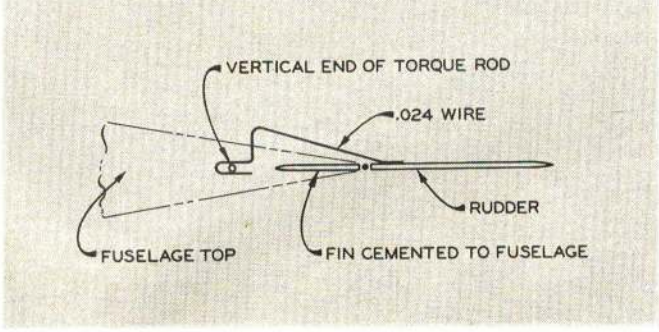
The Cadet fuselage is so short that Ted cemented a piece of unbraided control-line wire 3/8" back from the L.E. of the wing (presumably on top), running from tip to tip. The wire acts as a turbulator, and gives ample flying range. For atmosphere, a 1-in. scale Williams Bros. pilot, complete with scarf, is placed in the cockpit!

Stronger foam wings: To stand the rough treatment of high power and wild stunting, Paul Benkner (World Engines, Cincinnati) has strengthened the Midwest molded foam wings per sketch. A notch is cut on the underside, about 1/3 chord back from L.E., in which a Crawford fiberglass tube is buried. Rod halves are joined at the center with a close-fitting piece of brass tubing bent to match wing dihedral. The fiberglass tubes are cemented into the brass joiner, and the assembly fastened into the wing with epoxy. Glass-tube tips are sawn off flush with wing tips. No wings strengthened this way have ever failed!

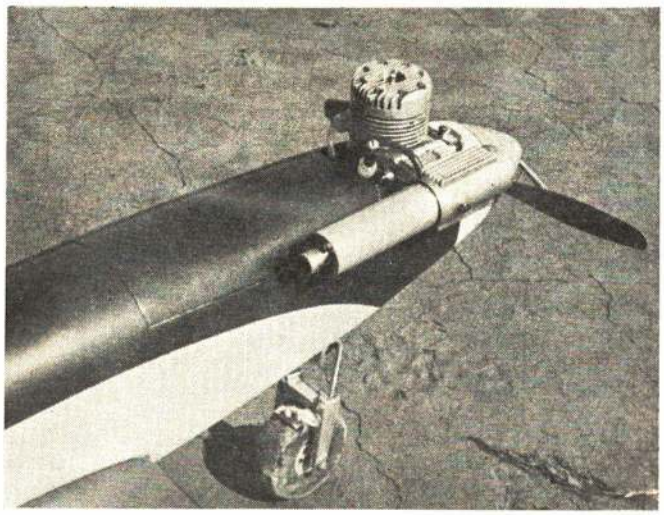
Hatch-cover fastening: When building a low-wing plane, Larry Hoffman (34-2, 2-Chome, Nishi Ogi Kita, Suganami-Ku, Tokyo, Japan) desired a neater fastening for



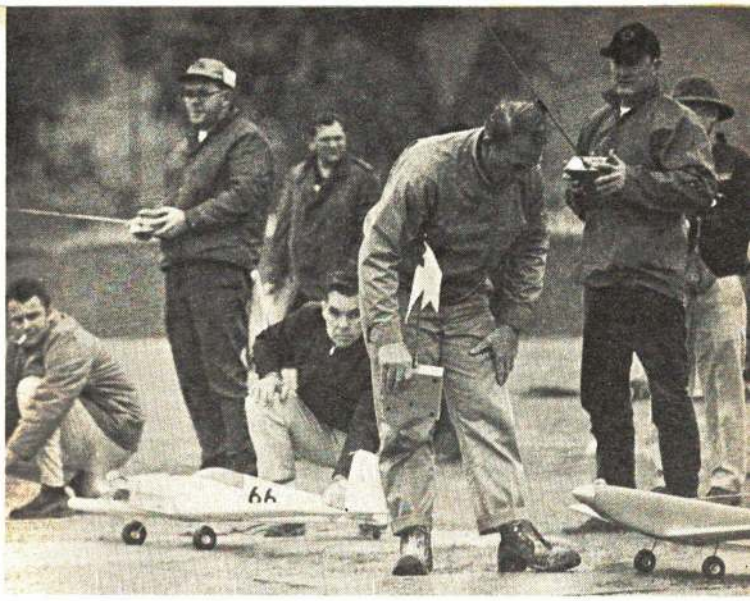
Ted Off mounts his Adams actuators with a long bolt through the coil and extends the shaft with .024 music wire direct to rudder.



Since his little semi-scale glider has such a big rudder, Ted controls it with the wire linkage in front of the vertical fin.



Automatically regulated pressurized fuel system, by Mr. Iaso Matsui, takes part of the muffler's back pressure into fuel tank.

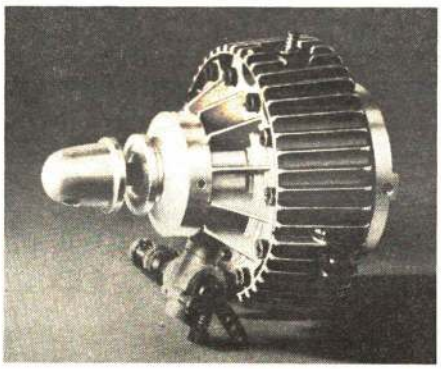


The start of an Open Pylon race at Tri-Counties Model Air Races got off in spite of torrential rains in California. Fast — noisy.

the tank hatch cover than the usual rubber band and clips. He evolved the scheme depicted. Two magnets from a small Jap electric motor are epoxied in the forward tank area, and a strip of tinplate goes on the underside of the cover. The tin is fastened in first. When its epoxy has set, set the magnets in place, and put the cover on while magnet epoxy is still soft. This assures there will be physical contact, allowing magnets to grip the tin securely. Rectangular magnets are best, though the slightly curved type in some small motors will do. This installation was in a plane with 30 engine. For larger planes, use more potent magnets.

We once tried a similar scheme to hold the transparent canopy on the nose area of a glider fuselage. The dowel peg was at front, a single strong magnet at the rear. A good fit was obtained, and it took a real pull to remove the canopy. But that was in the warm workshop! The canopy was of acetate sheet about .040" thick, with a ply frame around the edges. When taken out into cool air the plastic shrank, giving a bowed effect fore and aft. This pulled the magnet far enough from its mating steel plate so that most of the pull was lost. You can't win 'em all!

Too-potent high-start: Problems in launching a Kurwi glider were experienced by Dave Burt (3048 Central Ave., Evanston, Ill. 60201). We had discussed this with Dave at the Olathe Nats. The glider appeared to go into a high-speed stall soon after heading skyward. Very little altitude could be obtained. Dave found the trouble to be in



At last! This is a production version of the Graupner 30 cu. in. Wankel engine.

the elastic cord. When this 5/16" shock cord was stretched to full elongation, it gave about 25-lbs. pull. A ¼" cord gave only 14-lbs. pull. With the lighter cord, the increase in altitude (using a high-start with 120 ft. of shock cord and 400 ft. of line) was startling. Later tests with the heavier cord showed that if it was stretched to a pull of about 20 lbs. the glider would go aloft in fine style.

Dave's glider probably weighs around 4 lbs. The stalling problem involves many other factors besides weight, of course. Among them, might be wing and tail angles, wing section, etc. But this proves that you can have *too much* high-start pull, as well as too little. The shock cord Dave uses has an elongation of about 200%; beyond that, the outer braided covering prevents further stretching. Perhaps we should have some words of wisdom on this matter from some of the High-Start experts. How about it, DC/RC?

Pressurized fuel feed: Interesting system was used by Mr. Isao Matsui (member of the Tokyo Fliers Club) on his Corsaire plane which he later flew at our '68 Nats. It was equipped with a Supertigre engine and matching ST muffler. Instead of obtaining tank pressure the usual way (it generally comes from a tap on the engine crankshaft or backplate), Mr. Matsui tapped an outlet into the body of the muffler, and ran a tube from this to tank. This pressure keeps the engine running smoothly through all stunts, causes no problems with idling, and allows full engine power in spite of the muffler. Pressure is throttle regulated.

Handy hints: From M.A.R.S. Pulse (Montreal): Use the filter from an oil-furnace jet to filter outlet of your gallon can. Units are about ½" dia. x ⅝" high, made of pressed copper mesh, and usually are screwed in place right back of nozzle. Clean well (if it's a used one) in white gas or dope thinner, solder to brass or copper tubing.

From same source, to keep metal weight on the tube in a plastic clunk tank, dip the weight in butyrate dope thinner, then quickly slip it into new piece of tube. It will stick on tightly. . . . From A.A.M. Exec. Editor Sweeney, this tip on a knurled handle for a control stick. Get an aluminum blind screw driver tool from Sears. It has

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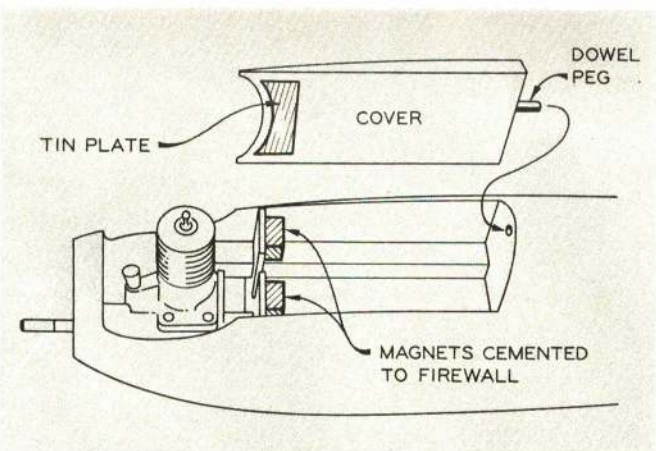
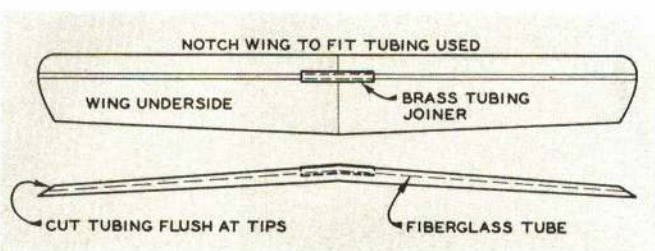


Neat method for attaching a hatch over the fuel compartment uses a pair of strong magnets in the fuselage and a piece of steel or tin on the cover. Holds surprisingly well for Larry Hoffman. The closer the fit between magnet and tin, the better.



Paul Benkner's method for strengthening Midwest foam wings for wild stunting requires just insetting a fiberglass pushrod tubing.

Highly detailed 1916 Curtiss JN-4D Jenny built from AAM plans by Walter Moucha Jr., spans 8½ ft. O.S. 80 powers this second-place Scale winner.

Northern-Eagle by Dave Gierke won show's best finish award. Fabulous painted-on riveting detail: 600 sq. in.

TOLEDO R/C EXPO-1969

Weak Signals' annual R/C Conference and Exposition eases winter doldrums. With Toledo gone, it is time to go flying.

HOWARD MC ENTEE

ALL attendance records were broken at the 15th Toledo R/C Conference, held March 1-2 at Maumee, Ohio, when 4345 persons paid to visit the dazzling show. Figure is far above 1968, and number of manufacturers was also up — 73, as against 70 last time! Entire floor area went to trade exhibits and model display. Swap Shop was in a side room, talks and movies were in an adjoining hall. Still there wasn't enough room. Weak Signals club members are already planning changes.

As in 1968, weather was clear, cold, but no snow on ground. Flying demonstrations were very successful.

What was new? Trends a little harder to spot now. Heat-shrink plastic coverings still going strong. Definitely more all-plastic planes, both ARF and otherwise. More makers offering glider kits (several ARF here too). More kits for smaller full-house multi-planes. Sub-mini digital systems — around 10 oz. for four controls — offered by several makers, make these entirely practical. Several complex R/C car kits (not in toy class) were seen, also more boats. Possible trend in "brick" concept of housing all components for a full-house multi model (except aileron servo, possibly battery pack) in a single compact case; new tiny components make this attractive. One maker has a brick on market, another showed experimental unit. A major manufacturer offers "progressive" system; same basic receiver and transmitter RF units used, interchangeable modules allow flying any propo system from simple rudder-only up to full-house digital, with different servos plugged in as required. It's been tried before, but we're betting it will succeed this time.

Strangely, there were few unusual engines this year. Final version of Graupner Wankel .30 cu-in. engine was on display. Will be in production by June; sale in U. S. not certain, pending investigation of patent rights. It will sell in Germany for about $60.

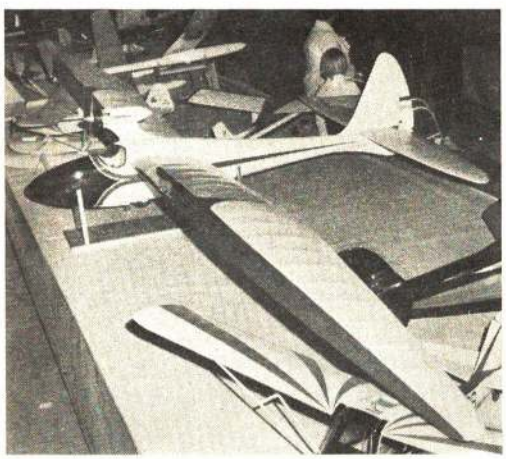
Many meetings and gatherings, of course. Several lengthy AMA sessions, a RCIA meeting. "Canada Night" brought out over 100 enthusiasts, will be featured from now on.

Prizes were given in nine categories, a "Best Junior" award was added this year.

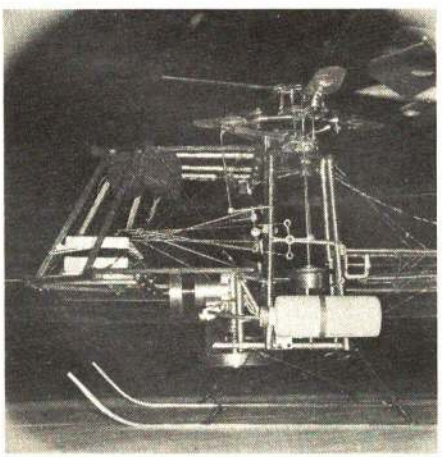
Motels were jammed for miles around — some ran out of reservations last fall! Get your bid in early for 1970 — the dates are February 28, March 1.

Once again, we must toast the Weak Signals Club of Toledo for what has become the "Greatest R/C Show on Earth."

Listed alphabetically are the newest products displayed by most of the exhibitors — can't guarantee we caught them all. If we've missed anyone, or missed a vital new product, our apologies in advance!



Winner of Arthur Christen Award was Harold Van Horn's 20', 23-lb. scale Albatross.



R/C helicopters will soon be reality! This one, 35-powered rig by Ray Jaworski.

The Tortang, open pylon and stunt plane: 40 power at 4½ lb. by Grabenstetter.

Ace Radio Control (Box 301, Higginsville, Mo. 64037): Kits for Versapro systems from AAM. Display of tiny R/C planes; plans for four of these now available, including profile Fokker D-VIII and Nieuport 17. The 36" powered glider, etc., to follow. Most will span about 25". New Adams Baby actuators shown, also the full line of More-Craft Goodies.

Aero Precision (5508 Noyes Ave. S.E., Charlestown, W. Va. 25304): Kit for full scale "American Eagle" bipe (1929 vintage) with 55" span, 990-sq.-in. area, for 40-60 engines — $39.95.

Aerotronics (109 Chatham La., Oak Ridge, Tenn. 37830: Engine-loks of Delrin, two sizes, for ⅛ and 3/16" mounting plates. Fuel-proof and hold under severe vibration.

Airtrol of Adrian (Box 392, Adrian, Mich. 49221): Many items, several complete systems for pulse propo; new line of semi-scale planes in plastic — sold as kits, or complete with radio installed. Span, 42-44" for 09-15 power. Also, new digital four-control system, complete for $299.50.

A-Justo-Jig Co. (Box 176A, Westfield, Ind. 46074): Well-known Ajusto-Jig for building wings is further improved with rib locators of tough ABS plastic — $35 FOB.

Andrews Model Aircraft Co. Inc. (2A Putnam Ct., Danvers, Mass.): Newest here is the A-Ray, earlier shoulder-wing design modified for ailerons, to carry miniature four-control propo systems.

Angel Mini-Flite Co. (340 Broad St., Fitchburg, Mass. 01420): "Blue Max" series of WW I bipes, and more recent sport monoplane trio, all about 45" span, and ARF in plastic with many novel features. For rudder-only to light multi-propo, 15-29 power.

Aristo-Craft Miniatures (314 5th Ave., N.Y.C. 10001): Kits for Air Cobra and Spitfire produce 5½' span planes; all-balsa framework, full multi, for engines to 60. Several boats, and complex R/C car kits here. Many ARF planes with FG fuselages and balsa wings, beautifully built.

ARK Products (4616 S. Harvey, Western Springs, Ill. 60558): Producing the former Y & O line of hard maple props from 7-18" diameter; most come in 4 or 6" pitch, some wider too. The 11-12" pusher props soon available in 4 and 6" pitch.

B&N Model Accessory Co. (94 Cedar Dr., Plainview, N. Y.): Mufflers for exact fit on 22 different engines, 29 to 61. Any size, $10. Experimental venturi design mufflers shown.

Burns Industries (Roper Mtn. Rd., Greenville, S. C. 29607): Semi-Scale ARF P-51 Mustang, all plastic, spans 50", for 29-45 engines, fully acrobatic. Kit, $46.95. Similar sized P-40 War Hawk in same form and price, soon.

Cannon Electronics Inc. (13400-26 Saticoy St., No. Hollywood, Calif. 91605): Kit, semi-kit or completed digital propo systems, three and five controls, several sizes of servos and battery packs. All 27- and 50-MHz frequencies; completed outfits on 72-76 MHz soon. Simpler pulse propo components still available.

Carl Goldberg Models (2541 W. Cermak, Chicago): Pioneer balsa kit maker has joined the plastic ARF surge with neat "Ranger 42" high-wing cabin R/C plane. Flies fine F/F, or with four-channel digital, 240-sq.-in. foam wing in one piece; 049 Cox for S.C., 09 for multi. Plane made from special light but very firm foam. More such kits coming, also larger planes of similar construction.

C C Products (891 Delaware Ave., Buffalo, N. Y. 14209): Precision marine V-drive units, water-cooled engine heads, surface-type steerable prop strut. Many items from boat line of Stinger Mfg. Co. New Italian O.P.S. high-power 60 engine, marine or aero versions, with tuned pipe.

Canadian Radio Control Electronics (38 Guardsman Rd., Thornhill, Ont., Canada): Digital systems for three-six controls. Receiver features FET semiconductors. Outfits made for all U. S. R/C frequencies. Silicon transistors throughout, three I.C.'s in larger receivers. Special circuitry to immunize against electrical noise.

C. Chopp (21 W. 210 Ahlstrand, Lombard, Ill. 60148): Nylon engine mounts in single size, to fit larger engines in boats or planes; $2.75 per pair, undrilled. No tapping or blind nuts needed.

Citizen-Ship Radio Corp. (810 E. 64th St., Indianapolis, Ind. 46220): Complete R/C line: escapements to six-control digital. Four- and six-control digi. transmitters now in slim vinyl-clad cases with enclosed sticks. Tiny DMS servos measure 2¼ x 2½ x 1" wide, less lugs. Four- and six-control digital in all frequencies.

Delta Systems (Box 754, Bridgeton, Mo. 63042): ⅛th scale GTX-1 car runs on engines from 19 to 60 (40 considered standard); several gear box ratios offered. Drive train includes cooling fan, disc brake, centrifugal clutch. Body is of epoxy-fiberglass. Concern has special 4-control digital R/C system for car uses. Car kit, (with ST 40, 6:1 gearbox) $219.95; R/C system with two servos, $249.95.

Dremel Mfg. Co. (Racine, Wis. 53401): Small machine tools ideal for model builders. Moto-Tool grinders, jigsaws, countless accessories. Moto-Shop incorporates five tools in one unit, including 15" capacity jigsaw.

Du-Bro Products Inc. (480 Bonner Rd., Wauconda, Ill. 60084): Plastic ARF Aero Commander 100 is joined by Cherokee Arrow low-winger of same construction — 49" span, 447-sq.-in. wing, for 35-45 engines and full multi-R/C. Kit includes steerable nose gear, $39.95 less wheels.

Dumas Products Inc. (Box 6093, Tucson, Ariz. 85716): Jim Kirkland's Triton R/C stunter added to line. The 62" span low-winger has fiberglass nose and cowl, foam wings, balsa fuselage. "Drag'n Fly" hydro is latest in boat line; top speed with 40 to 60 engines.

EK Products (3233 W. Euless Blvd., Hurst, Texas 76053): Logictrol five- and seven-control systems revised, have fully-enclosed stick. Similar unit on single-stick transmitters, rudder pot in knob. Simple adjustment for stick tension. Transmitter cases are 1⅞" thick. All R/C frequencies. Pro-series similar, but specially selected parts, longer guarantee. Digi-Ghost in production.

F&M Electronics (137 Vermont Ave. NE, Albuquerque, N. M. 87108): Further development of Quasar kit digital systems, comprehensive instruction books, special parts packaging of components. Single- or dual-stick transmitters; miniature KEK servos with F&M amplifiers. Also sold in finished form, all frequencies.

Franklin Glue Co. (2020 Bruck St., Columbus, Ohio 43207): Popular Titebond cement in tubes and larger containers, also other Franklin adhesives.

G.E.M. Models (Box 342, Broadview, Ill. 60153): 18" and 25" long ski-boats added to line of FG boat kits. Latter for up to 29 engines, costs $26. TAS Model P-7R engine at $55.95 comes with parts for glo or spark ignition; 2½ hp, water-cooled. New components listed in catalog.

Gould-National Batteries Inc. (931 N. Vandalia St., St. Paul, Minn. 55114): Nicad cells for fast-charge; made now only in 1 and 1.2AH sizes, sealed cells may be fully charged in three hours. About same price as regular cells.

H&R Engineered Products (5235 Calyx La., Toledo, Ohio 43623): ⅛th scale R/C car with Indy body (other styles coming) completely assembled, less engine and radio for $75. Has automatic clutch, turned aluminum wheels, urethane tires bonded to wheels. All parts sold separately.

Hallco Products Inc. (Box 38158, Urbana, O. 43078): Several complete systems for pulse rudder flying with Adams actuators. Complete 101B system (2.5 oz. flying weight with Adams Baby and superhet receiver, nickel-cad pack for plane), $69.95. Redesigned Hallco Ghost systems lower in cost; dual actuator 123TA system now $139.

Dwight Hartman (Argenta, Ill. 62501): Improved fuselage for New Orleanian is the HF-42; combo of fuselage and foam wing and stab, $32. Wing kit, $10. Cowl for Northrop T'Winger bipe, $4.50.

Heath Co. (Benton Harbor, Mich. 49022): Five-control digital system kit has redesigned transmitter, thinner case, Kraft control sticks. Receiver now only 2 x 2 7/32 x 2 5/32", weighs 2.3 oz. Heathkit/Kraft capacitor servos still used. Rx battery pack now flat. All frequencies available. Complete kit, $219.95. Tiny "Thumb Tach" is operated by light, puts no load on item being tested; kit about $20.

Pettit Paint Co. (507 Main St., Belleville, N. J.): Hobbypoxy products and model construction methods demonstrated. Illustrated instruction sheet available for making Frank Jacobs "Easy-Does-It" fuselages.

Kraft Systems, Inc. (450 W. California St., Vista, Calif. 92083): Production of familiar Gold Medal digital series expanded with move to new plant. Concern experimenting with "unit" plane installation packages, may produce one.

Lancer Engineering (Box 544, Pekin, Ill. 61554): Has taken over line of model engine kits and parts originated by Elmer Wall. One- to four-cylinder engines offered. Kit for making a water-cooled V-8 engine of 3 hp to come.

Lanier Industries Inc. (Oakwood, Ga. 30566): New ARF low winger is the Aero 600; span is 48" with "roll aids" (tip plates) or 65" without. Costs $49.95 with plates. Eagle 750 and Condor 1000 are Lanier entries in ARF glider field. The 75" three-piece Eagle wing has polyhedral; four-piece Condor wing has regular dihedral. Flat-bottom airfoils on both.

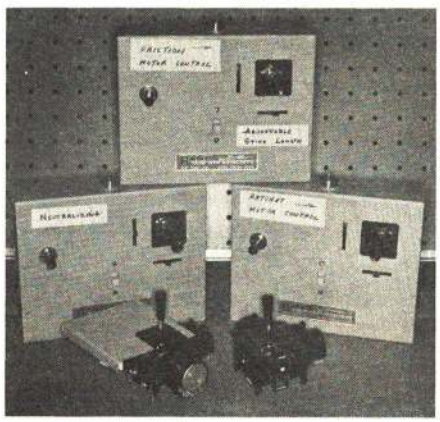
Major Model & Mfg. (333 Terry Rd., Hauppauge, N. Y. 11787): Semi-scale WW I Saulnier and Eindecker joined by a modern low-wing stunter Mirage. Has 42" span, 380-sq.-in. wing, for 15-40 power. Built-up construction, for full-house multi. Kit, $24.95.

Micro-Avionics (530 S. Mountain Ave., Ontario, Calif. 91762): XL-1C digital systems feature smaller Tx case, smoother control stick units, five integrated circuits. Battery charger now in transmitter case. Redesigned receiver, two servo sizes. Single or dual transmitter sticks, all frequencies. Systems have four or six controls.

This home-built twin-Rossi 60 is one-of-a-kind for powerboat racing by L. Habony.

Manufacturers . . .

Wing Mfg. Avenger with retract gear.

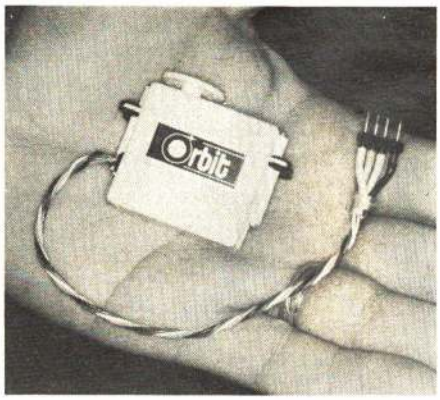


Rand Mfg. stick units and complete systems.

Major Model Mfg., the Ziroli Mirage design.

V.K. Models Cherokee Babe, 19-35 engines.

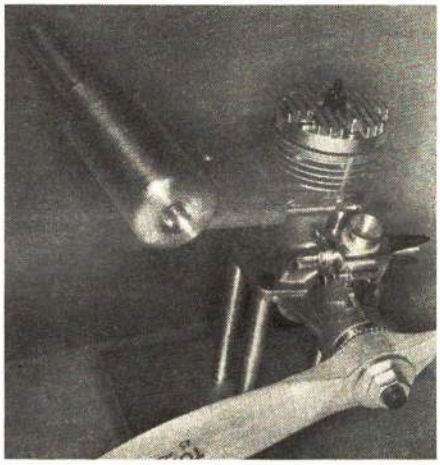
ACE R/C profile scale designs by Scenksen.



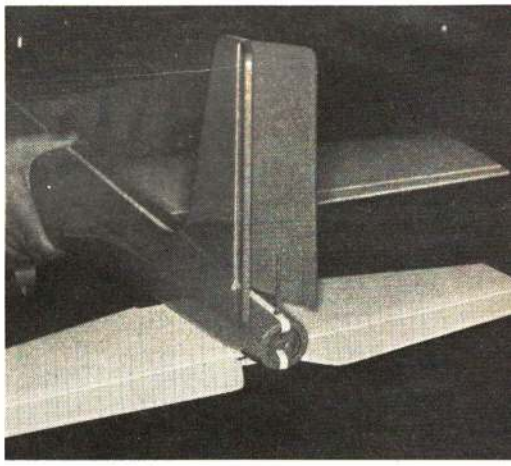
Tiny, powerful, light Orbit PS-4D servo.

Goldberg with molded all-styro Ranger 42.

DuBro's plastic Piper Cherokee Arrow ARF.

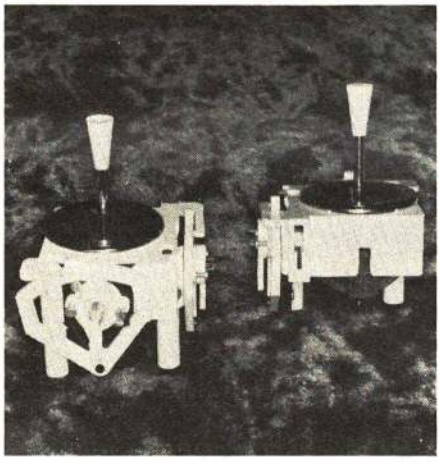


B & N Mufflers flo-thru for any engine.



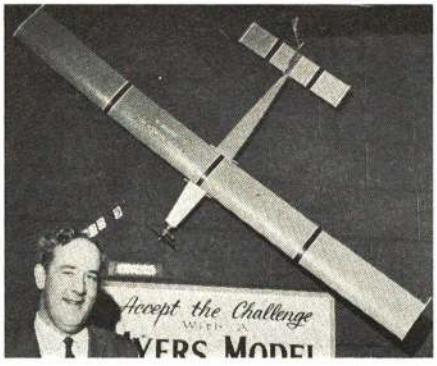
Vic's Custom Models Son-O-Jet.

Heathkit on all freqs. Solid-state IF.



KEK Products fully-adjustable stick units.

Lanier Industries slope/thermal soarer.



Myers Models. Cloud Nine. Balsa ARF.

Midwest Products Co. (400 S. Indiana, Hobart, Ind. 46342): "Das Little Stik" kit (46" span) flyable with 19-35 engines; $22.95. "Flea Fli +10" is 10% enlargement of Kraft's little Flea Fli, has 42" span and 336-sq.-in. area; for 19-23 power. No price yet.

Min-X Radio Inc. (8714 Grand River Ave., Detroit, Mich. 48204): Redesigned Min-X digital MXK four- and six-control transmitters, in vinyl-clad cases, have Kraft-Hayes sticks — either single or dual. Available with Kraft or Logictrol servo mechanical parts. Chargers are separate. RCS-III system is special for race cars, has single stick with detent for gear shift.

Model Engineering (3655 Calumet Rd., Decatur, Ga. 30034): "Smokey Joe" is a smoke generator based upon Tatone Peace Pipe, fittings regulate flow of low-cost smoke liquid; $14.50. Simple $2.50 prop balancer needs no leveling or lubrication.

Model Rectifier Corp. (5300 21st Ave., Brooklyn, N. Y. 11204): MRC-Futaba five-control digital costs $299.95. Includes four servos, nickel-cad packs and separate charger. Extra servo is $30. Two-stick transmitter holds antenna at efficient angle. MRC stocks the improved HP-61 engine.

Myers Models & Co. (Stewartstown, Pa. 17363): "Cloud 9" ARF glider has 71" span poly wing, gets aloft with 049 power. For rudder and throttle R/C (or add elevator), all-wood construction; $37.50. "Dutch Boy" ARF trainer is for RME controls, 09-10 power; has ply and balsa fuselage, foam wing and stab; $34.50.

Nelson Model Products Inc. (Box 2027, Dublin, Calif. 94566): Rapidly growing line of equipment (many makes) offered. Factory-authorized sales and service for Simprop and EK R/C systems. Jerry Nelson's own design scale KA6 glider dominated display. Many glider kits will be stocked.

North American Hobbies (7423 Bacon Rd., Petersburg, Mich. 49270): Tiny electric-drive R/C Rogue Racer in two body styles. Complete system for one car with het receiver, nickel-cad drive battery and charger, receiver and transmitter, $129.95. Components sold separately; most may be had at considerable saving in kit form.

Octura Models (8148 Milwaukee Ave., Niles, Ill. 60648): New line of props for high performance boats is based on Octura X design; available in seven sizes (1.6 to 2.8" dia.) in either nylon or beryllium copper. Latter are untempered, easily shaped to suit user. New high strength aluminum alloy is used in Octura

60 and Super-60 motor mounts.

One Design Electronic Models Inc. (521 Lakehurst Rd., Tom's River, N. J. 08753): Concern specializes in two boats, 67" long (1106 sq. in. sail area) "Half Meter" racing yacht with glass hull, and 5' 3"-long scale copy of Bertram "Moppie" offshore racing power boat. Many accessories stocked for both, including R/C systems.

Orbit Electronics (11601 Anabel Ave., Garden Grove, Calif. 92640): Four- and six-control digital with new tiny PS-4D servos. Less lugs and control wheel, servo measures 1½ x 1⅜ x ¾" wide, weighs 1¼ oz. It is offered by several R/C makers in their lightest systems.

Palco Hats Inc. (S. Norwalk, Conn.): Frequency hats and flags in all R/C color combos; $4.95 and $1.25 respectively. Also club emblems, wing and transmitter bags. Emblems can be printed or embroidered on shirts, jackets, etc.

P-B Inc. (2695 Kings Park Circle, Decatur, Ga. 30034): Electric fuel pump delivers 12 oz. in 37 sec. on 6V supply (or in 22 sec. on 12V); $7.50. Reversible to empty tank. Field Caddy with pump mounted and one gallon plastic container; $22.45 FOB.

Penford Plastics Corp. (Prospect, Ohio 43342): Potent hand-held electric starter for all engines through 60; $14.95 with cord and battery clips; $29.95 with small lead-acid 12V motorcycle batt. "Bruiser" is semi-scale Goodyear design for 049 to 15 power; 44" wing, 264 sq. in. area. For GG or small digital radio. Plastic fuselage, foam wing and stab. In ARF form for $24.95.

Precision Marine Products (1100 Adams, Denver, Colo. 80206): "Marblehead" class racing yacht of 800 sq. in. sail area, is 50" long. Fiberglass hull with mahogany deck. Complete kit, less keel, $74.95. Also sold ready-to-sail. Several hydro and SK boats. "Volant" T-tail R/C glider, finished fiberglass fuse., all balsa parts for $39.95; has 100" span wing.

Pro-Line Electronics Inc. (Box 5464, Phoenix, Ariz. 85010): "Competition Six" digital system on 27-50 MHz, one or two sticks, with four servos, $450. 72-MHz outfit soon. Receiver and servos will operate with two cells dead in battery. Three-wire servo connections. Special AGC circuit allows large change in signal strength. Servo output transistors not damaged by stalled motor.

Proportional Control Systems (450 W. California St., Vista, Calif. 92083): Four-control dual stick system on all R/C frequencies. No changes here.

Quick-N-Easy Products (Box 441, Wausau, Wis. 54401): TopCotE is thin heat-shrink polyester film with special coating on outer surface to hold dope, lacquer, paint, etc. Underside cement activated by heat. In clear and Satin Chrome finish. The 26 x 60" roll of clear is $3.95; of chrome, $4.95; concern also specializes in club emblems.

Ra/Car Developments (522 W. Central Park Ave., Anaheim, Calif. 92802): ⅛th scale R/C race cars with gear shift, automatic clutch. Many body styles. Assembled, in kits, or all parts available separately. Concern also stocks suitable R/C systems.

Radio Operated Auto Racing Assoc. (625 S. Euclid, Suite 20, Anaheim, Calif. 92801): The "AMA" of the model race car field. Sends monthly newsletter to all members — 25c for brochure and membership form.

Rand Mfg. Co. Inc. (8909 Hubbell Ave., Detroit, Mich. 48228): Exciting news is "progressive" R/C system that can start with propo rudder-only, go on up to multi-digital. Transmitter and superhet receiver are retained; system changes made by easy substitution of modules. New Dual-Pack elevator servo does not "go-around" with throttle change signals. Rand will have own feedback servos.

R/C Development (1836 Alabama Ave., Ft. Wayne, Ind.): New universal digital servo is 2.3 x 1.7 x .85" wide, weighs 2 oz., two push-pull output arms. Adaptable to many systems; $35 with suitable plug.

Rocket City Specialties (1901 Polk Dr., NE, Huntsville, Ala. 35801): Extensive line of horns, clevises, brakes, links and other small metal and plastic parts. New items are throttle link for Log III servos, several sizes of clear fuel tubing; latter tough, won't harden or age.

Royal Electronics Corp. (2101 S. Leyden, Denver, Colo. 80222): Three new pulse propo transmitters for GG etc. Classic multi-digital now available with single-control stick, also on six meters. Electronic tachometer coming. Most items from former F&M single-channel line.

Royal Products Corp. (Box 22186, Denver, Colo. 80222): Extensive line of domestic and imported model supplies, including many own exclusive, items.

Sherlock Aircraft Models (1275 Dana Ave., Palo Alto, Calif. 94301): The 55" span model of Lear Jet is 57" long, 550 sq. in. area. Assembled plastic fuselage, foam wings. Single 40-60 engine goes on nose. Six to seven lbs. with four-channel radio.

Simul-Logic Systems Corp. (184 Green Ave., Woodbury, N. J. 08096): Seven-control digital system. Two-stick transmitter, internal charger. All R/C spots. Receiver has triple-tuned RF stage, four IF stages, weighs 2 oz. I.C.'s used in encoder. Orbit servos with own amplifiers.

Sig Mfg. Co. Inc. (Montezuma, Iowa): 69" span accurate scale Citabria design by Maxey Hester. Kit includes formed wheel pants and aluminum LG. Full length fuselage sides. Light-wing loading; $29.95.

Sonic-Tronics (8042 Craig St., Phila., Pa. 19136): "Twin-Tone Ghost" transmitter for pulse propo. All silicon transmitter and receiver, Rand servos. Complete GG system $129.95; with Rand Dual-Pak, $149.95. Regulated current battery chargers, run cold, same current for 1 — 24 cells in series.

Sterling Models (Belfield & Wister, Phila., Pa. 19144): 1½" scale SE5a, 40" span, 600 sq. in. area,

Continued on page 69

Model Rocketeer

NATIONAL ASSOCIATION OF ROCKETRY

1239 Vermont Avenue NW, Washington, DC 20005

MASSACHUSETTS SECTION PLANS AHEAD

MIT Model Rocket Society, assisted by prominent citizens, has founded the Massachusetts Regional Conference for Model Rocketry. Model rocket clubs in the state have been invited to join MRCMR, said MITMRS President Thomas Milkie recently. He added that the Conference will serve as an organizing body to press for legislation for the aerospace hobby in the state, and to obtain launch sites. Tom will need the help of numerous people and clubs to make model rocketry a prestige hobby and maintain it in the proper perspective throughout the future for all interested modelers. If you can lend support to the Conference, contact Tom through MITMRS, MIT P. O. Box 110, Cambridge, Mass. 02139. (Credit Steve Chessin)

LAC FIELD TRIPS/NEWSLETTER CONTEST

NAR's Leader Administration Council plans to sponsor several regional field trips this summer in certain East Coast locales. LAC announced in February that one trip is being considered for Pittsburgh-Cumberland area, one for New Jersey, and one for the Washington, D. C. area. Sections in these areas will be contacted by LAC members, who will act only to coordinate plans so that the trips fit into section schedules.

LAC also plans to sponsor a section newsletter contest, so send two copies of each issue to Elaine Sadowski, LAC Secretary, 1824 Wharton St., Pittsburgh, Pa. 15203. All entries will be judged by knowledgeable persons who are not LAC members. A handsome trophy awaits 1969's winner who will be announced at NARAM-11.

AAR TOPPED THE NATION

Back in December, the Annapolis Association of Rocketry in Maryland, which during the fall started to grow faster than anyone anticipated, registered for a '69 NAR charter with 42 members. Then, in January, AAR sent its claim to NAR headquarters, as the largest section in the 50 states. After a little checking, however, officials discovered that the Randallstown Rocket Society section, also in Md., registered soon after AAR with 45 members. Another close contender is the Fairchester Section in Conn., with 38 members. Though their joy was short-lived, AAR members will be able to look back and say, "Remember that month we led the nation for members . . ."

SECTION PRESENTS APOLLO 8 FILM

"Apollo 8's Flight to the Moon," narrated by Burgess Meredith, was presented for public viewing in New Canaan, Conn., Feb. 3, by the local YMCA Space Pioneers Section. The unusual film was released by NASA in January. It tells the story of Apollo 8's flight around the moon on Christmas Eve, hailed throughout the world as one of the greatest feats of exploration in the history of mankind. How about your community? Why not write the nearest NASA office, to their Education Services Officer, for details on how to obtain the film.

SHORT BURSTS FROM THE PAD

BRRA is a newly chartered NAR section in Illinois, which has made some remarkable progress in a short time. Called Beardstown Rocket Research Association, the section has a dandy newsletter and emblem. BRRA members viewed the NASA film "Apollo 7" recently in one of their meetings. As an appropriate salute to Apollo 8, BRRA members launched a Saturn model rocket during the moon-flight, claiming a flawless performance. Officers for '69 in the Anchorage Association of Model Rocketry are: Bob Westmoreland, president; Jack Pennington, vice president; and Jim Eshenower, secretary-treasurer.

Another sharp-looking newsletter, The Tracker, was launched in December '68 by the Southland Association of Rocketry, Los Angeles, Calif. SOAR reported holding its first NAR-sanctioned contest with Philip Kemp #11301, taking the parachute-duration prize for a 5:18.5 flight, and Vince Jahn #11621 taking first in scale with 891 points. SOAR also scheduled its first area meet called SLWC-1 against the NAR Titan Section of West Covina. Results were not available at press time. MDRA, the Metro Denver Rocket Association section, sent in their first newsletter with good artwork, during January. The mile-high group is busy constructing equipment, raising funds and preparing for NARAM-11 at nearby USAF Academy, August 11-15. MDRA has scheduled afternoon launchings April 6 and 20, May 4 and 18, and June 8 and 22 at their Hogback Range. Lastly, Andy Elliot, editor for ZOG 43, the newsletter published by NARHAMS section in Silver Spring, Md., sent in his latest issue. ZOG 43 features news, plans for a B/G, and special workshop information.

Watch for features on NAR sections beginning with the July issue.

NAR MEMBERS

MODEL Rocketeers note! We are always seeking construction articles on model rockets and their design, launching and tracking devices and, in general, the techniques involved. You need not be a Hemingway — just tell about your project, include clear photos and an understandable drawing. This last item can even be in pencil; we'll have one of our staff add the finishing touches.

If there is any question, or if you want to check out an idea with us — send a brief note and a description. Even send a snapshot or two. We will try to answer promptly.

The Editor

TRY YOUR DEALER FIRST

Here Are Some of Our Aces

- **ALABAMA**

Alabama, Birmingham 35211
SPIVEY STORES
1301-03 Tuscaloosa Ave.

Alabama, Huntsville 35805
HUNTSVILLE HOBBY SHOP
2100 Triana Blvd.

- **ARIZONA**

Arizona, Phoenix 85012
WEBSTER'S HOBBY SHOP
521 E. Camelback Rd.

- **CALIFORNIA**

California, Burbank 91505
T & A HOBBY LOBBY
3512 West Victory

California, Covina 91724
COVINA HOBBY CENTER
140 North Citrus

California, El Cajon 92020
MIKE'S MODEL SHOP
229 E. Main

California, Eureka 95501
KING'S HOBBIES
318 W. Harris

California, Pleasant Hill 94523
OAK PARK HOBBY CENTER
1902 Oak Park Blvd.

California, San Diego 92103
HILLCREST HOBBY CRAFT
3921 Fifth Ave.

California, San Jose 95128
HUSTON'S HOBBY SHOP
930 Town & Country Village

California, Watsonville 95076
McKELL DRUG CO.
Alta Vista Shopping Center
40 Mariposa Avenue

- **CANADA**

Canada, Richmond, British Columbia
D AND R HOBBIES
1130 Williams Road

Canada, Calgary, Alberta
CALGARY HOBBY SUPPLY
Box 3173 Postal Stn. B

Canada, Prince Rupert B. C.
PRINCE RUPERT R/C CENTRE
936 6th Ave. East

Canada, Saskatoon, Sask.
SASKATOON RADIO CONTROL CO.
Box 1625

Canada, Toronto, Ontario
KLEIN BROS. SPORTS & HOBBIES
3187 Bathurst
Phone RU 7-0631

- **COLORADO**

Colorado, Denver 80220
TOM THUMB HOBBY CENTER
7020 East Colfax

Colorado, Pueblo 81001
D & S PAINT CENTER INC.
217 West 9th Street

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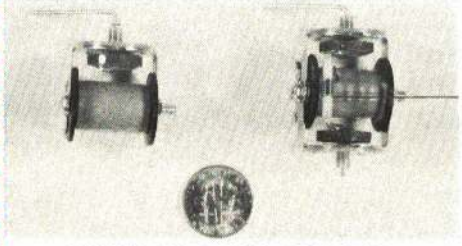
Looking for new R/C ventures? Join the swing to the new mini planes which have appeared in recent model magazines. We specialize in the light weight components you need for these jobs. You will find listed just a few of the items we have now—more are being added regularly.

Join the swing to fun—build 'em small and have a ball!



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From Adams comes the AR Baby actuator. Results in lower drain for an over-all lighter weight. Plenty of torque for the mini jobs, the AR has only 40 to 50 milliamps current drain on 2.4 to 3 volts, so it can be used with some of the smallest batteries for a tremendous saving in weight.

Uses the same frame and is the same size as the regular Baby, but the secret of the weight saving is in current consumption. Weight of the AR is 17 grams.

No. 14K31—Adams AR Baby Actuator.....$8.45

For the modelers who have the regular Baby and want to convert to lower drain coil, it is available separately. Conversion is simple and takes only a few minutes with hand tools.

No. 14K32—Adams AR Coil only.....$4.00

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The Baby Actuator by Adams is now available as a Twin in either the regular or AR version. The twin magnets provide approximately 2½ to 3 times the torque of the single units and increase weight only slightly. The regular and AR Baby weigh approximately 17 grams, while the Twins weigh 22 grams.

The regular Baby Twin has the most torque and pulls around 110 mah on 2.4 volts, while the AR version pulls 40 to 50 mah at 2.4 to 3 v. The AR is designed for the Micro and Mini series of planes where weight is important and smaller batteries are used to keep overall weight as low as possible.

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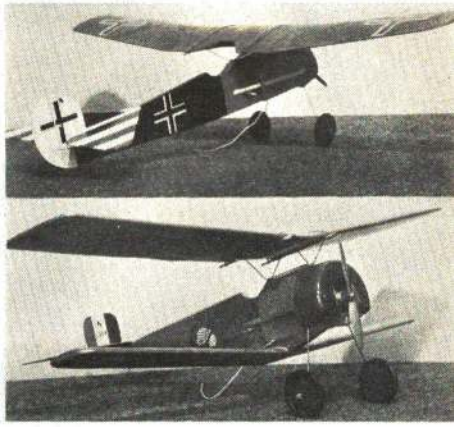
Whether it's Tufline fuel tubing, or a 2/56 x 1⅛" machine screw, or an item from almost any major manufacturer, the chances are good that Ace has it in one of the most comprehensive lines of Accessories, Components or Equipment available anywhere. Our own designer-approved radio kits are added to by lines from E-K, Bonner, Lanier, Midwest, Bee Line, SPL, Coverite, Jensen, Rocket City, Su-Pr-Line, Sterling, MRC, Enya and Webra, etc., etc., etc.

NEW!



PROFILE R/C PLANS AVAILABLE

Full size plans for the Mini Profile R/C planes are available now for the Fokker D-VIII and Nieuport 17. By Chris Soenksen. Detailed in our Ace R/C Data Supplement 69-2 Picture Story, they scored a hit. Plans are offset printed and are 17 x 22". Price includes First Class Mailing.

More plans will be coming—watch for them.

Join in the latest challenge to hit R/C—build a Mini Profile. Average span is 25 inches and area about 120 squares.

No. 13K31—Fokker D-VIII Profile Plans.....$1.00
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For the Micro and Mini Planes you need smaller and lighter batteries. We have a complete listing of silver-oxide, alkaline and nickel cadmiums in our new catalog. Fresh stock assured because of fast turnover.

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You need a lighter weight wire than ordinary hookup when building the miniature jobs. We have #30 PVC insulated with 7 strands of #38 only .033 diameter. Packaged in a Six color pack each length is three feet long.

No. 35K3—Six Pack hookup wire #30.....$1.00

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These are a must when you want to tame the Cox .010 or .020. Simply set to position for the desired RPM and you have a tame power plant that is just the ticket for the new mini scale and semi-scale planes. Be sure to order the correct one for your engine—not interchangeable.

No. 16K105—Vogt Restrictor for .010.....$2.00
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DE SUPERHET RECEIVER

This is the first superhet receiver to be produced by Ace R/C! And it is a first in many respects: Small—measures only 1 3/16 x 1¾ x ⅝"; Light-weight is about .8 ounce; Relayless-but double-ended (DE) with 1 amp transistors in output for hookup direct to dual coil actuators; Low voltage—works reliably at maximum range on just 2.4 volts; Versatile—works with most any transmitter of from 400 to 1400 hz; Pulses—exceptionally fast.

Manufactured by Ace exclusively under license agreements with designers — several circuit breakthroughs found only in this unit.

No. 12K1—Commander DE SH RX Pulse Assembled $26.50

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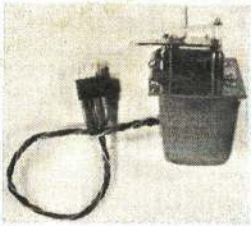


R/O PULSE MOTOR CONTROL

Now you can add motor control to your Commander RO Packages. May be used for Testor System. The high Pulse Rate Motor Control by Ken's R/C uses four wires to hook up to your pulse installation, and is complete with a three position spring wound escapement to give you high, medium and low motor control on a throttle valve engine.

Entire unit weighs 1.1 ounce with leads, completely wired and tested. The high pulse rate required is approximately four to seven times the rate normally put out by your pulse transmitter. For the Commander RO Package, a simple conversion kit, which consists of an extra capacitor and a pushbutton switch allows the high pulse rate to be added economically and easily. Motor command does NOT affect rudder positions.

No. 16K63C—Ken's Motor Control with escapement, $19.95

COMMANDER R/O TX CONVERSION KIT

Conversion kit for the Commander RO transmitter, as described above, complete with instructions, and all components required.

No. 15K62—HPR (High Pulse Rate) Kit for Commander, $2.50

NEW! NEW! NEW!

VERSAPRO

Fred Marks

Components and Parts Packages for all of the Versapro Systems as detailed in American Aircraft Modeler are available. Sent with all new catalogs or separate listing available — send a stamped self-addressed envelope.

SERVO MECHANICS—Controlaire S-3 and S-4 and Kraft-Hayes KPS10. For the tinkerer to make his own digital or analog servo. All are complete with motor, feedback pot, gears, shafts, output hardware, etc. S-3 and S-4 in easy to assemble kit form; KPS10 preassembled. Mechanicals only, no electronics. No. 14K17—S-3 $9.98; No. 14K18—S-4 $8.98; No. 14G55—KPS10 $13.95

LAHTI ANALOG SERVO ELECTRONICS—Complete kit of all electronics needed to make an excellent analog servo with highest resolution from S-3, S-4 or KPS10 mechanics. Use it with the AAM decoder for simple rudder only NON-FLAPPING control. No. 15G31—Lahti Analog electronics only kit, $11.95

AAM PULSE AMPLIFIER-FILTER provides the analog signal required from the Commander DE receiver for use with analog servo. This provides proportional with no flapping of the surface. Much more powerful and uses current only when servo is in motion so smaller batteries may be used. Kit contains PC board, transistors and components for filter. No. 15G24—AAM Analog Pulse Amplifier Filter $6.95

LAHTI DECODER COMPONENTS

We have the PC base and all components required for the several versions of the Lahti Decoder System as published in RADIO CONTROL MODELER. We are offering here only a few of the selected components, but we do have a parts list which is yours for a self addressed stamped envelope, which contain all of the other components required, depending on the version of the decoder that you choose to build.

No. 28K50—Lahti PC Board, G10 etched and drilled.....$3.45
No. 18K30—22 mf 15 volt.....$1.00
No. 18K39—10 mf 6 volt.....$1.00
No. 18K1—1 mf.....$ .75
No. 29K36—5K trim pot.....$ .79

All ¼ watt resistors and capacitors, connectors, and other components are in stock.

COMMANDER R/O PULSE PACKAGES
Ideal for Beginners and Sport Fliers

Get one of the Ace Commander R/O packages and you get the Commander DE Superhet Receiver, Commander Pulse Transmitter, Adams Actuator of the size you want, along with matching nickel cads, and completed wiring harness, AND you save up to $10.00 over buying singly.

We have the packages as matched sets in three basic offerings to suit your every R/C sporting need from the smallest to the larger sized aircraft. Ready for easy installation.

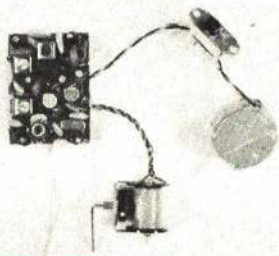
The Baby Pack is for the .010 and .020 jobs although it can be used with tame .049's. Package has two GE 225 ma BHL nickel cadmium batteries and Baby Adams. With wiring harness and switch, completely assembled.

The Standard uses the LV Single Adams for more power for .049 to .07 size. Is furnished with two GE 500 ma BHL nickel cadmiums. With switch harness, assembled.

The Stomper uses the LV Twin of the Adams line for up to .15 or even .19 size jobs. Comes with two GE 600 ma cylindrical cells. With switch harness, assembled.

(Charging equipment not furnished.)

No. 10G15—Commander R/O Baby pack....$69.95
No. 10G16—Commander R/O Standard Pack 71.95
No. 10G17—Commander R/O Stomper pack 74.95
(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)



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ACE VARI-CHARGER

IN KIT FORM OR ASSEMBLED

Will charge nickel cadmium batteries—20 mils to 150 mils. Capable of charging up to 12 volt packs. Indexed dial & simple chart for correct milliamp reading for charging different size battery packs. Completely isolated from AC line supply. An extra deluxe item. New transformer of highest quality. UL approved line cord. On-off switch. 500 milliamp diode. Full instructions.

No. 34K21—Ace Vari-Charger assembled $8.95
No. 34K22—Ace Vari-Charger Kit 7.50

GG PACKAGE #2

The Ace GG Package #2 is the lightest and most reliable Galloping Ghost unit on the market today. Thoroughly flight proven, the package uses Don Dickerson's See Saw Switcher which is unique in that it develops full power with only 2.4 volts.

The See Saw Switcher was expressly designed for use with the Ace Commander DE Superhet receiver which is winning critical acclaim from R/C fans all over the world.

Add to this, the updated Jansson transmitter which has been revised to provide clean RF output and you have a truly outstanding package.

The airborne pack has the Switcher, charging jack, on-off switch and Rand LR3 mounted on an epoxi PC panel measuring 2¼ x 4¾". The receiver and battery are connected to this board by cables. This allows best weight distribution. Total airborne weight is 5½ ounces, yet the GG #2 works for engines up to .19 and has been successfully used with larger aircraft.

Batteries furnished are the GE 600 mah sintered self sealing vented cells for flights of approximately one hour per charge.

By buying the package you save almost $20.00 over the individual component costs—AND you get the assurance of a matched and tested rig that will give you hours of pleasure and let you fly, fly, fly—!

No. 10G2—Ace GG Package #2 $109.95
(Specify frequency desired. All 27 MHz, except 27.255.)

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For the Fun Flyer and Tinkerer

Our 1969 Handbook-Catalog is bigger and better than ever. We specialize in equipment for the Beginner, Sunday and Fun Flyer. More items for the do-it-yourselfer; more products from most major manufacturers, in addition to many Ace exclusives. Greatly enlarged HANDBOOK section. Last year this was called "bible for R/C", "a MUST!" by R/C editors. Price is just $1.00 POSTPAID. This is completely refundable on your first order! And that order also puts you on our mailing list for our newsletters and R/C Data Service —acclaimed the world over. You can't lose—send your buck on a round trip today. It could be the best dollar you ever spent!

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Mold A Fuselage

Continued from page 21

to give rigidity to the finished fuselage.

Mark the exact location of the bulkheads on the formed shell from their location on the form. Cement the bulkheads to one side only. Match the A or B side of bulkhead to the proper shell. Lay out and install the tubing for the pushrod guides at this time. I use 1/16" wire for pushrods through nylon tubing cemented in as a conduit.

Mate the remaining ½ shell to the one with bulkheads. Mate the two sides fore and aft, matching the bulkhead locations exactly across from each other. Check for a good fit of the top and bottom edges. Use masking tape to pull the pieces together. See Fig. 10. At this stage you may have to shave down a bulkhead or trim an irregularity in the edges to obtain a good fit. (Cutting too much off of the shell edge will lessen the circumference and the bulkheads will in effect be too large.)

When satisfied the halves fit well, remove tape and shell, coat the bulkheads and the edges (with the 1/8 x 1/4" cleat) with Titebond or Willhold. This glue air-dries slowly, and you will have time to slide the shell around to position it properly. Poor positioning at this time can cause a twisted or crooked fuselage. (Contact cement is not recommended.) Secure, and pull up the seams tightly with masking tape across the joints where necessary.

Sand the fuselage lightly. To remove the indents in the balsa, caused by the gauze, staples and rubber bands, apply water to these spots to raise the grain. Most indents will come out this way. Some will require two treatments. When sanded, you will be barely able to find any glue seams or dents. (Fig. 11.)

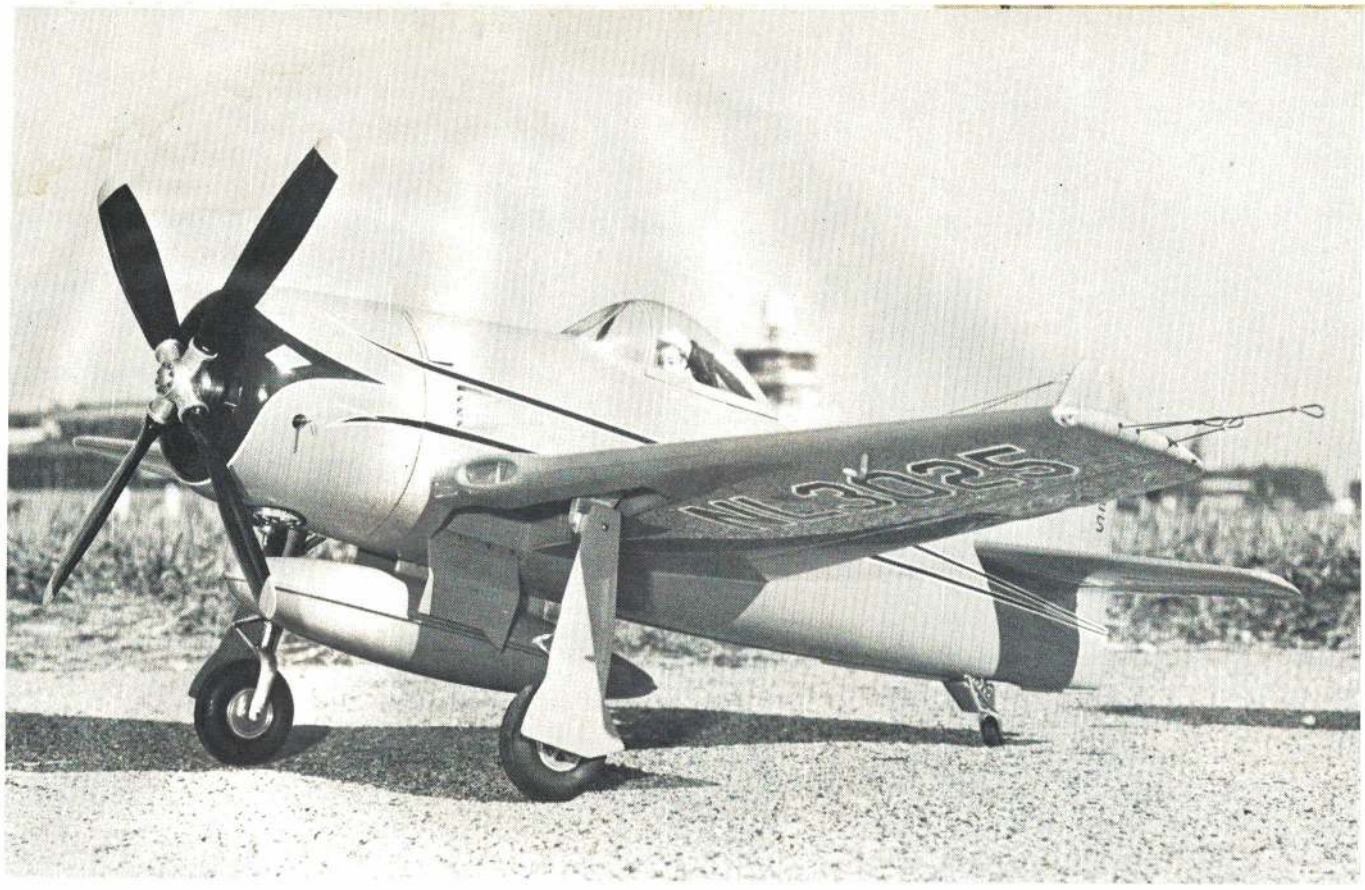
Using a rib foil pattern, layout the wing cut-out, on the side using the side glue seams as a reference line for the desired incidence angle. (Fig. 11.) The angled hatch cut-off line is accomplished by curving a celluloid rule over the fuselage, holding with masking tape, while marking the lines. This should run just short of the bulkheads fore and aft of the wing. Cut the foil opening with the X-acto knife. Then you can sever the center bulkhead and cut along the hatch line to remove the hatch. Trace a pattern, from the fuselage cut-out hole, for the bulkheads needed for the fuselage and hatch ends.

The stab mounting can be of your choice either on top or through the center with the longeron as a support for mounting. In the typical cross-section drawing, is shown a method for stiffening the wing mount section. The doublers of 1/16" plywood and balsa run past the wing chord to the bulkheads fore and aft to distribute the load. Plywood also serves as dowel gussets.

Should you wish to use other doublers for any reason, to support engine mounts, etc., these can be molded of balsa or plywood for these sections by the same method used for the shells. On the glider, I molded a 1/32" plywood bottom nose plate 2" wide and running back under the wing for reinforcing and to attach a skid. I also glassed the forward bottom section and nose very lightly with light cloth and resin. (In case by some chance I boo boo a landing.)

If you "crinkled" a section of the balsa during forming, don't fret or throw the shell away. Mold a section of patch for this particular area. Fit it into the shell after they are assembled by cutting out the bad area and replace it with the new patch.

I'm sure you will take pride and enjoy this method of constructing something different, lighter, stronger, and shapelier than the ordinary method of flat side construction.



Highly detailed control-line model of Al Williams' Gulfhawk was made by Warren MacZura. Weighs 4¾ lbs., spans 36″, in 1″-to-1′ scale. Powered by throttled-35 engine. Wing area and size are about as small as practical without being a flying bomb. This plane won the first World Championships in control-line scale, was featured in American Aircraft Modeler Annual 1968.

Find the Area

Pain-relieving scheme for scale modelers gives wing span and area in a flash!

DAVE PLATT

TABLE FOR FINDING THE WING AREA AND WING SPAN OF A PROJECTED SCALE MODEL

To Find Area: Multiply area of real plane (in sq. feet) by area factor in column D. Answer is area of model (in sq. inches).

To Find Span: Multiply span of real plane (in feet) by scale in column A. Answer is span of model in inches.

A	B	C	D	E	F	G
Scale	Fraction Equivalent	Fraction of Full Size	Area Factor	1/72 Dwg. x	1/48 Dwg. x	1/36 Dwg. x
1.0″	1″	1:12	1.00	6	4	3
1.09″		1:11	1.19			
1.16″	1-1/6″		1.36	7		
1.2″	1-1/5″	1:10	1.44			
1.25″	1-1/4″		1.56		5	
1.33″	1-1/3″	1:9	1.78	8		4
1.375″	1-3/8″		1.89			
1.5″	1-1/2″	1:8	2.25	9	6	
1.6″		1:7.5	2.56			
1.625″	1-5/8″		2.65			
1.66″	1-2/3″	1:7.2	2.78	10		5
1.716″		1:7	2.95			
1.75″	1-3/4″		3.06		7	
1.83″	1-5/6″		3.36	11		
1.875″	1-7/8″		3.52			
2.0″	2″	1:6	4.00	12	8	6

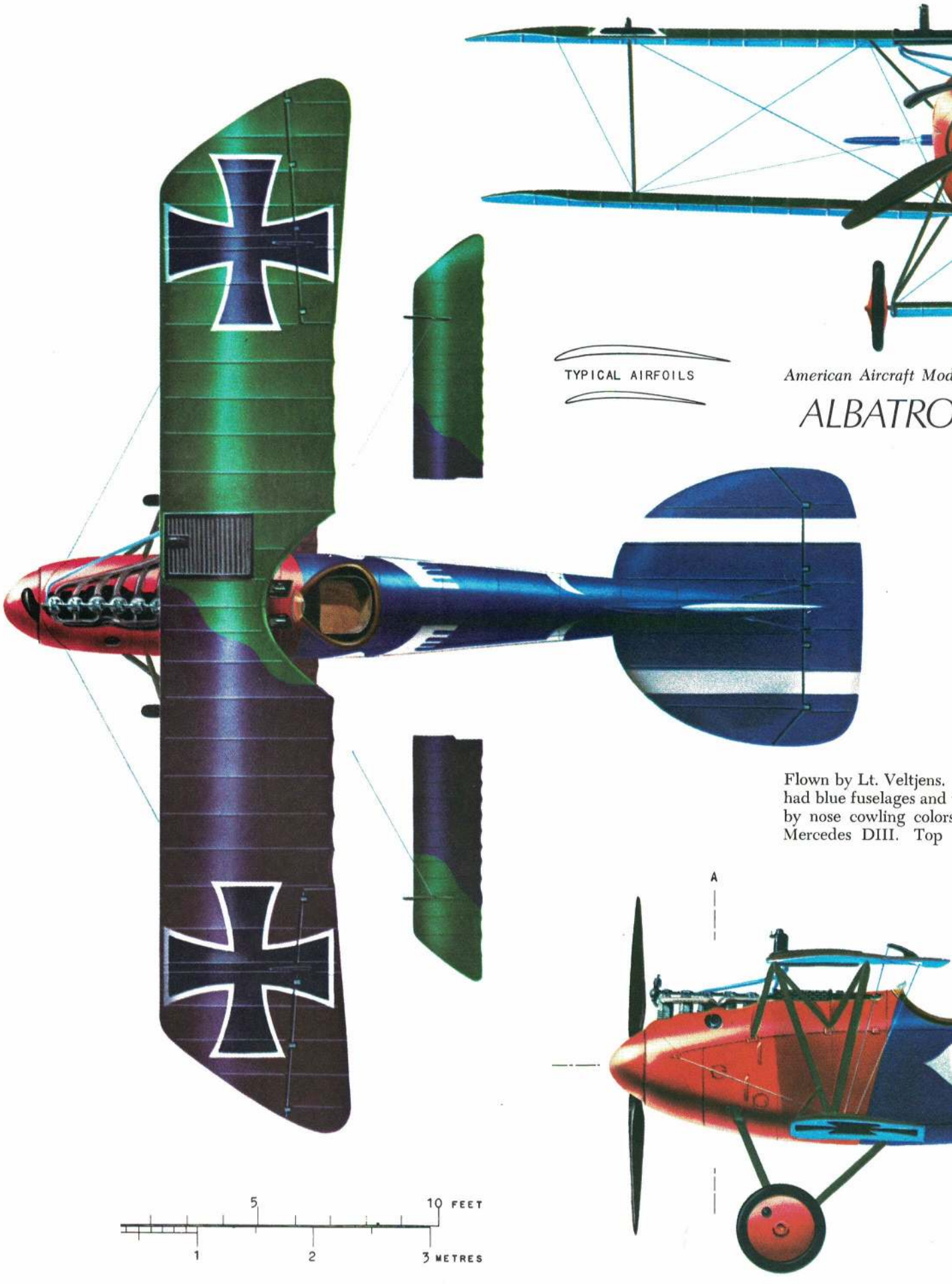
THE first and most heart-searching problem that a scale modeler encounters when engaging upon a new project is the apparently simple one of choosing his subject. I'm sure we all know from personal experience exactly how "simple" a job this is. I cannot give a fool-proof method of overcoming this problem. The fact is that I have just as much trouble as anyone else in this regard. But what I *can* do is help a little by saving some time and fruitless work in the step immediately following the choice of subject — the critical matter of what size or scale the model shall be built to. Bearing on this are such factors as airfoils, all-up weight, amount of detailing, and type of aircraft.

The most vital dimension of any model is its wing area. Wing span, of itself, does not matter but results inevitably from the area chosen. Having chosen a suitable wing area bracket for our model, based upon the intended purpose or class of scale model we want, the specific question is: To what scale must the model be built to give an area closest to our requirements? The table will give the answer to this important question in a few moments, and without any drawing or measurement of the scale plan. We need to know only two figures: the wing span and the wing area of our subject full-size airplane.

Let's take a couple of examples to show how the table works. The simplicity of the scheme will be evident.

Case 1: Joe decides to make a P-47 Thunderbolt for full-house propo R/C. A suitable wing area for this model will fall in the 600-750 sq. ins. bracket. The wing span and area of the P-47 are 40′ 9″ and 300 sq. ft. respectively. By looking at the table, we find that the area of a 1½″ = 1′ (⅛ full-size) model will be 300 x 2.25 = 675 sq. ins. Not bad for a first attempt! Span will be 40.75 x 1.5 = 61⅛″. For this model, Joe can

Continued on page 66



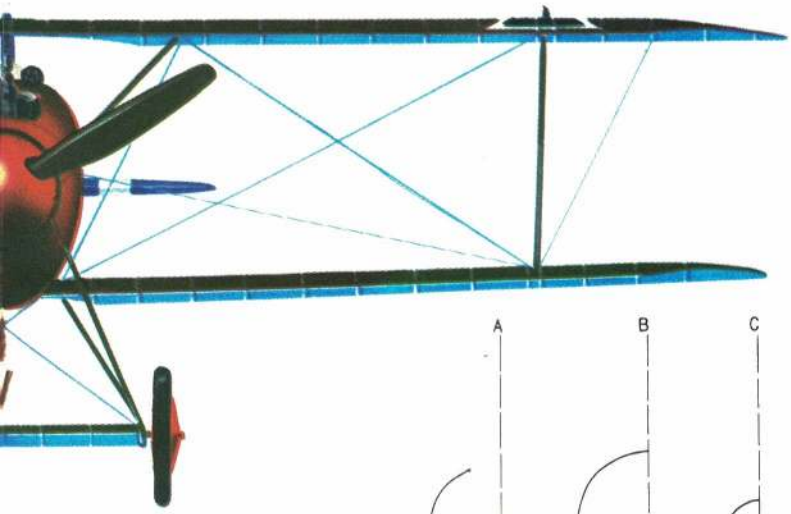
American Aircraft Mod

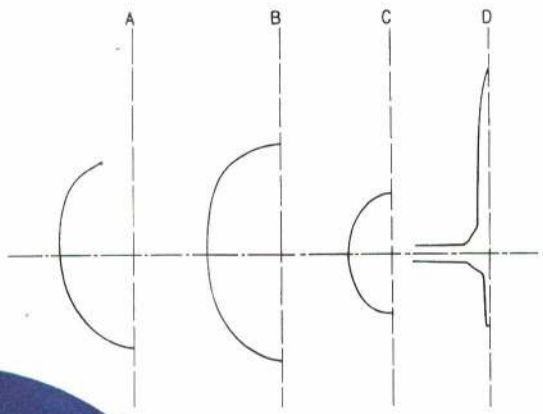
ALBATRO

Flown by Lt. Veltjens.
had blue fuselages and
by nose cowling colors
Mercedes DIII. Top

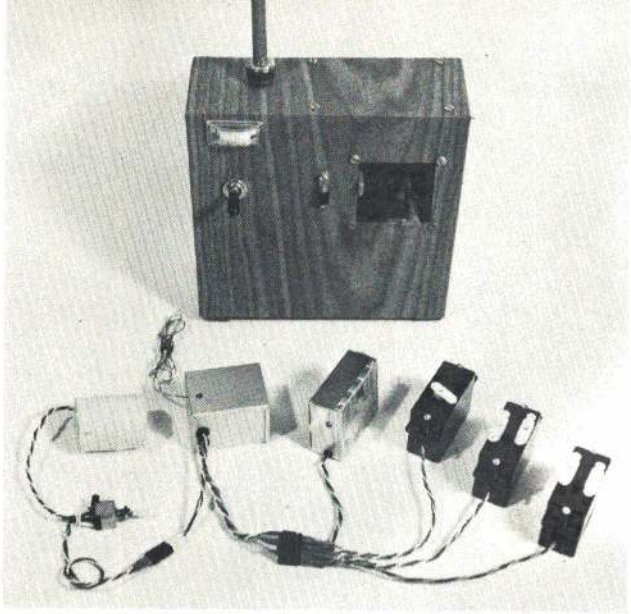
album of all-time favorites:

D. Va (1917)

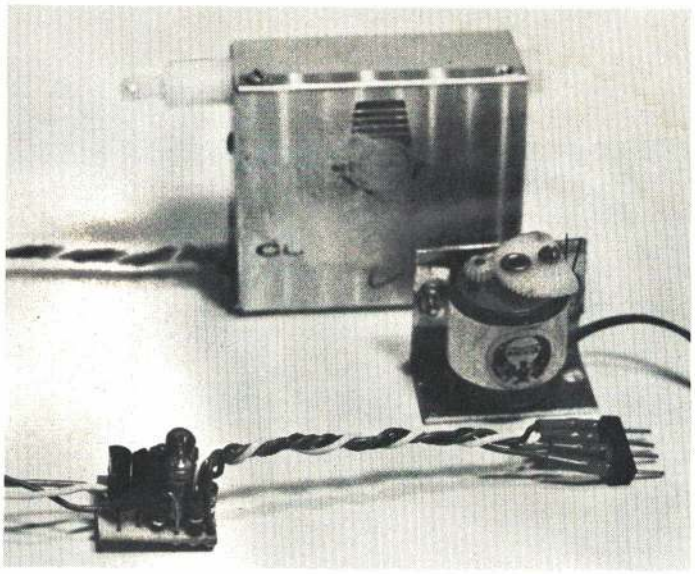




aircraft of Jagdgeschwader 2
with Jasta identity provided
owerplant was 170/185 hp
d approximately 103 mph.



Maximum use of single-channel gear with Versapro components is four-servo system suitable for 60-powered stunt planes. Weight, size, and power are comparable with modern digitals.



Trimmable throttle operation is easily achieved with mechanically or electrically limited trim servos using Versapro dual POD. It fits easily inside ANNCO, Controlaire, and Bonner reed servos.

VERSAPRO SS-3

VERSAPRO SERIES SYSTEM — CONCLUSION

Throttle servo POD driver construction, elevator retention during engine speed changes, use with most receivers, and the SS-4 configuration.

FRED M. MARKS

THE Versapro SS-3 is the full-house version, or the Mode-4 configuration of the Versapro system described in the May '69 issue. The decoder described contained the pulse-width driver and filter, the pulse-rate decoder and filter, and the analog signal lock-out to permit independent control of two analog channels plus full on and off for throttle control or, alternatively, extreme pulse width for throttle with elevator control retained.

The basic units for all Versapro systems are the same for all modes: The decoder, the conversion for the Rand servo, and the POD throttle drive. All modes are obtainable simply by the combinations of servos chosen.

The pulse omission detector: Those who fly the current Galloping Ghost or decoded pulse systems are aware that just four throttle positions are available from the go-around servos. The pulse-omission detector (POD) and throttle servo drive are combined in one unit designed to permit trimmable throttle from either a reed-type servo or from a very simple lightweight positionable servo. The objective was to provide the third function which completes the SS-3 system. Upon completion of the POD and the decoder, we now have proportional rudder and coupled aileron, proportional elevator, and trimmable throttle.

The throttle unit is also quite attractive for use with any pulse system to provide infinitely trimmable throttle via an auxiliary trim servo, instead of the usual four positions. More thrust, easier mounting, and instant response are also achieved.

The proportional servos may be existing feedback servos (listed in the previous article) or they may be converted Rand servos as described in the March issue.

Fig 1 presents the schematic for the POD servo drive. The signal lead connects to the rudder servo driver output, thus sees a pulsing alternately positive and negative signal. The 1N34 diodes steer the proper polarity to Q1 and Q2 and their respective holding circuits formed by C1 and C2 and the 2.2K resistors. Q1 and Q2 are biased on by the two 2.2K resistors. However, as long as the pulsing signal is present, both C1 and C2 are charged and can only discharge through the 2.2K resistor and Q1 and Q2. The charge on C1 and C2 is opposite the polarity provided by the 2.2K resistors, thus both Q1 and Q2 are held off as long as the pulsing signal is present.

The 100 ohm resistors serve as collector load for Q1 and Q2 and also bias Q3 and Q4 solidly off.

Application of full on, or high throttle,

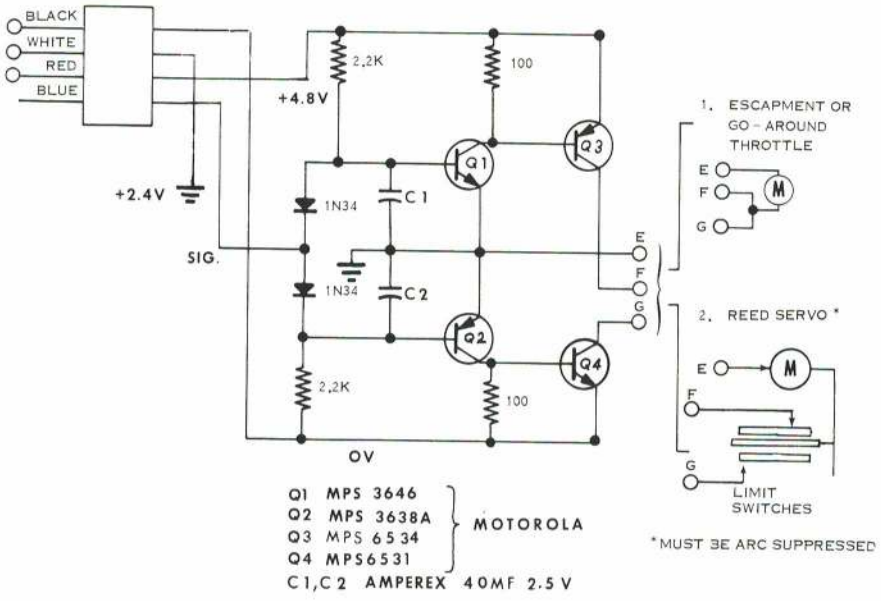
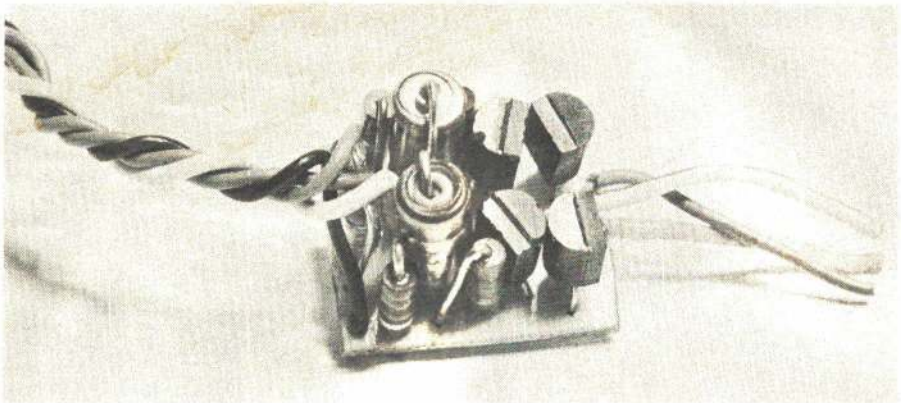
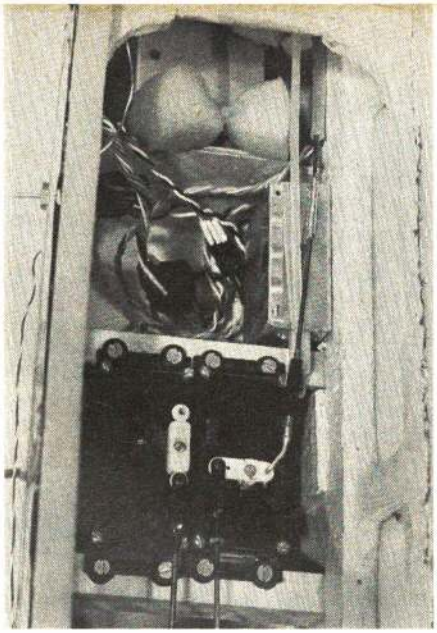


Fig. 1 Circuit is deceptively simple. Two pulse-ommission detectors hold off the drive transistors during pulsing and one, or the other, drives with on-or-off signal of length greater than 1/10th second. Parts substitution not encouraged.



When constructing the POD carefully check transistors, capacitors, and diodes to have proper orientation and polarity. Note flat side of transistors and tops of capacitors.



SS-3 is actively flown in Skylane 62 using Controlaire reed servo with POD and older Orbit PS-2A analog servos. Lead pix shows newer, better Orbit PS-3A analog servos.

presents a steady positive signal at the junction of the two IN34 diodes. This biases Q2 solidly off and permits C1 to discharge through its 2.2K resistor and Q1, in about 0.1 seconds at which time Q1 is biased through its 2.2K bias resistor and, in turn, switches Q3 on to drive the throttle servo. Full signal off simply causes the same chain of events through Q2 and Q4 to drive the throttle servo in the opposite direction.

A lightweight trimmable servo is available by modifying an Airtrol pulse servo by opening the centering spring to the point at which the segmented gear still just barely meshes with its pinion at each end. You may also construct a similar simple unit. It is best to have it geared down well over 200 to 1 to avoid an extremely rapid transit time. A Ballamatic or Trimomatic servo can also be used.

If an infinitely trimmable throttle servo is desired with electronic limit switching, then almost any good reed-type servo can be used. The general limit switching arrangement for a trim-type reed servo is depicted in Fig. 1. The exact lands and arrangement for almost all reed servos are different, therefore, you must ascertain the arrangement in the servo used and wire accordingly.

The POD throttle driver is quite small ($\frac{5}{8}$ x $\frac{3}{4}$") and can be mounted with servo mount tape either inside or on the chosen throttle servo.

Construction of the POD throttle drive is a matter of minutes. The full size PC layout is presented in Fig. 2. Fig. 3 presents the layout of components and transistor basing. The decoder presented last issue has the necessary output or you may simply wire the POD into your own G.G., or decoded circuit observing the polarities shown on Fig. 1. The input signal is the pulsing servo drive signal in this arrangement. Diodes have banded end up. The POD driver will be available through ACE R/C in kit form.

Retaining elevator during throttle changes: The primary means for throttle changes for the Versapro system is full signal on or full signal off. However, the desirability of retaining elevator during throttle changes can not be overlooked. The use of electronic decoding, which triggers only on the leading edge of each pulse, permits the rate decoder to continue to function at pulse widths in excess of that needed for rudder control and in fact, sufficient for relatively fast go-around throttle movement with normal pulse servos. When this technique is used with the go-around type feedback conversion of the Rand servo, throttle changes are obtained much more quickly than for the usual Rand servo since there is no centering spring to restrain rotation.

No changes are required to the decoder to permit elevator control to be retained. However, the Versapulse transmitter presented in the April issue must be modified slightly to provide extreme pulse-width changes instead of full on and off.

Fig. 4 and 5 show the changes required. First, remove all wiring from all six lever switch contacts. Remove these wires at their opposite end from points B, C, and J on the pulser/audio board and from the power switch. Don't forget to remove the

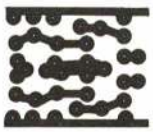


Fig. 2

Full-size copper-side printed-circuit board can be made with X-acto knife cutting lands on PC board material. Photo process is best.

jumper from contacts 2 and 6. Next, run a jumper between points B and C on the pulser/audio board. Referring to Fig. 4, connect a jumper between contacts 2 and 5 of the lever switch and connect a hook up wire from contact 2 to point Z on pulser/audio board as shown in Fig. 5.

The final step in the modification is selection and installation of R1 and R2 shown in Fig. 4. Install a 2K potentiometer between Lug 1 of the power switch and Lug 1 of the lever switch. Operate the system with both servos centered exactly. Close contacts 1 and 2 of the lever switch and adjust the potentiometer so that the rudder/throttle servo goes around at the maximum rate obtainable without disturbing the elevator. Now check operation at full up and down elevator. If necessary, increase the setting of the potentiometer if a tendency for elevator position drift appears when throttle is changed at full down elevator. In no case should rudder command be given during throttle changes since the pulse widths will be additive and full signal will result in elevator go-around.

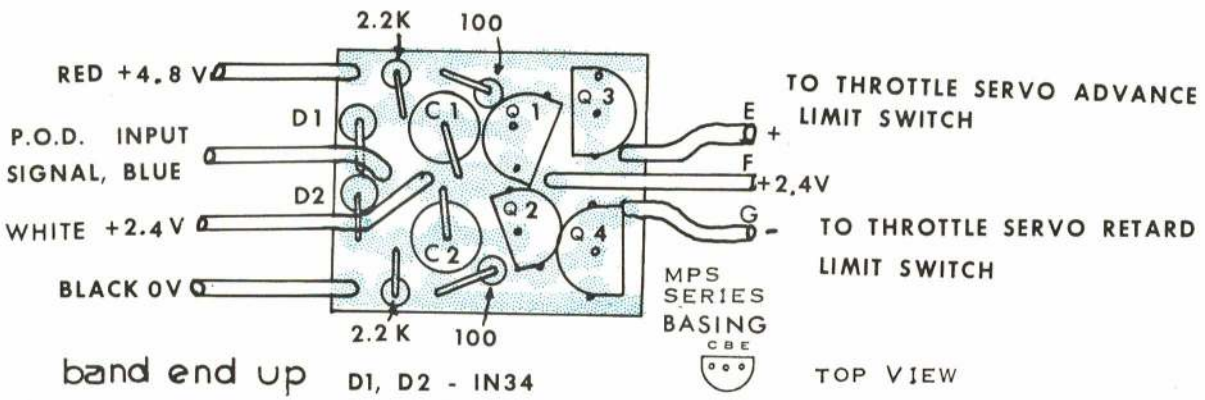


Fig. 3 Using this parts-location diagram, the POD is easily assembled. Be careful not to mix up transistors; four types are used. Mount POD in servo with double-sided servo-mounting tape.

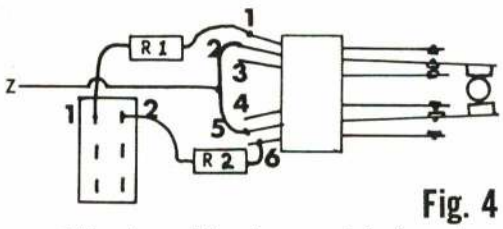


Fig. 4

Wire transmitter lever switch for extra-wide pulse-width throttle operation by tailoring R1 and R2 to suit your own set.

Remove the potentiometer and replace it with the nearest value fixed resistor. Use sleeving over the resistor leads to prevent inadvertant shorts. Repeat the above process for R2, bearing in mind that throttle rotation will be in the opposite direction.

Because the system can be operated at higher rates than for G.G. or most rate-decoded systems, spring centering can be lightened considerably for faster servo go-around.

Compatibility with various receivers: The Versapro decoder was designed for operation with the ACE Commander DE superhet receiver. It has been flown with a number of other receivers both relayless and converted relay types. These include the Controlaire SH-100, and Controlaire (4 regen) Citizen-Ship SSH and SSH-P models, Cannon single-channel superhet, Min-X SH-1, and the C & S Finch.

Most of these require no changes to the decoder but operation can generally be optimized by a) increasing the value of R1 on the decoder to 330 ohms and b) operating with the maximum audio frequency the receiver will accept. The reason for both is the same; to provide the most effective filtering of the audio signal. Any audio signal appearing at the rudder driver output will completely disrupt operation of the rate decoder and must be eliminated.

Relay receivers are readily converted by removing the relay. The relay drive signal then becomes the output signal just as for the relayless receiver. It may be necessary to increase the relay filter capacitor (normally a 10 to 15 microfarad) usually connected across the relay coil input points to filter more effectively.

The only receiver tested which required further change was the C and S Finch, a relayless super-regenerative receiver. Fig. 6 shows the simple modification required to the decoder. This modification may be necessary on most of the relayless regen receivers since it seems most of them have a large capacitance in the output circuitry and the transistor must have a collector load prior to the voltage dropping diode.

Operation and versatility: If you yearn for a brand new radio-control system to fly a full-house acrobatic airplane, this is not the rig for you. However, if you have a quantity of pulse equipment or perhaps some of the elements of the Versapro, then you can expect to have a versatile system for operation of a wide variety of aircraft types. The units described in this series have been flown in gliders, a number of rudder-elevator-throttle planes such as the S-Ray, Skylane 62, Falcon 56, Mambo Special, an American Products full-house, a Beachcomber, and in a low wing version of the Senior Falcon. There is no real performance limit.

In this article series, we have presented Versapro SS-1, SS-2, and SS-3. There also is an SS-4 version. SS stands for Sport System. The suffixed number refers to the number of servos you can use.

SS-4 is simply flying with the rudder and aileron servos coupled. All-out low-wing planes are flown with a coupled servo for the aileron function. With these planes, only two full-time proportional controls are required, aileron and elevator. The throttle and rudder are secondary. To get the most out of the system, the rudder function can be uncoupled at full throttle, although flying with coupled rudder and aileron is no problem in itself (but the rudder throw should be restricted).

With an uncoupling rudder function, normal full rudder travel can be used. For this full-house operation, switch the aileron and rudder signal leads at the decoder PC board. Now the separate plug is the primary directional control. Also bring out a lead from the new rudder signal lead at the PC board and a lead from center tap at the PC board. With the system operating, notice that touching these leads together will neutralize the rudder servo but permit the aileron servo to continue following the control stick.

Hook these two leads to a micro-switch mounted on the throttle servo. Set it up so that full throttle closes the switch and uncouples the rudder servo. In flight, or on takeoff, retarding the throttle gives coupled operation. During stunting at full throttle, the rudder is centered.

Readers and users comments on Versapro and its concept are most welcome. Please write author in care of American Aircraft Modeler, 733 15th St. N.W., Washington, D. C. 20005.

CORRECTIONS

In the SS-1 article, in the March issue: a) Fig. F erroneously tied the signal lead to OV (center tap). The center tap should go only to the bottom of the three capacitors and to the servo plug; b) Fig. D, battery C.T. is called out with —2.4V. Battery C.T. should tie to the PC land immediately below, at the junction of the three capacitors.

The remaining articles of the Versapro series will use OV to indicate the most negative side of the battery, +2.4V to indicate the center tap of the battery pack, and +4.8V to indicate the most positive side of the battery. The diagrams of the switcher/filter schematic and parts layout used OV as center tap with —2.4V and +2.4V at the sides of the battery measured from center tap. Switcher/filter diagrams should be corrected to the OV, +2.4V and +4.8V style.

The Versapulse drawings (April 1969) contain two errors: a) Point J on Fig. 4 should be at the junction of the emitter of Q6 and the two 1K resistors, Items 35 and 36. Point J is located properly on Fig. 5, and the lower left lead of transistor Q6 on Fig. 5 should be labeled the emitter, e; b) The color code on the leads going to points E′ and D′ on Fig. 6 are transposed; i.e., the red lead should go to D′ and the black lead to E′. As to the value of CD1 and CD2: these can be any silicone diodes capable of carrying 400 milliamperes with a PIV of at least 100 volts for a reasonable margin.

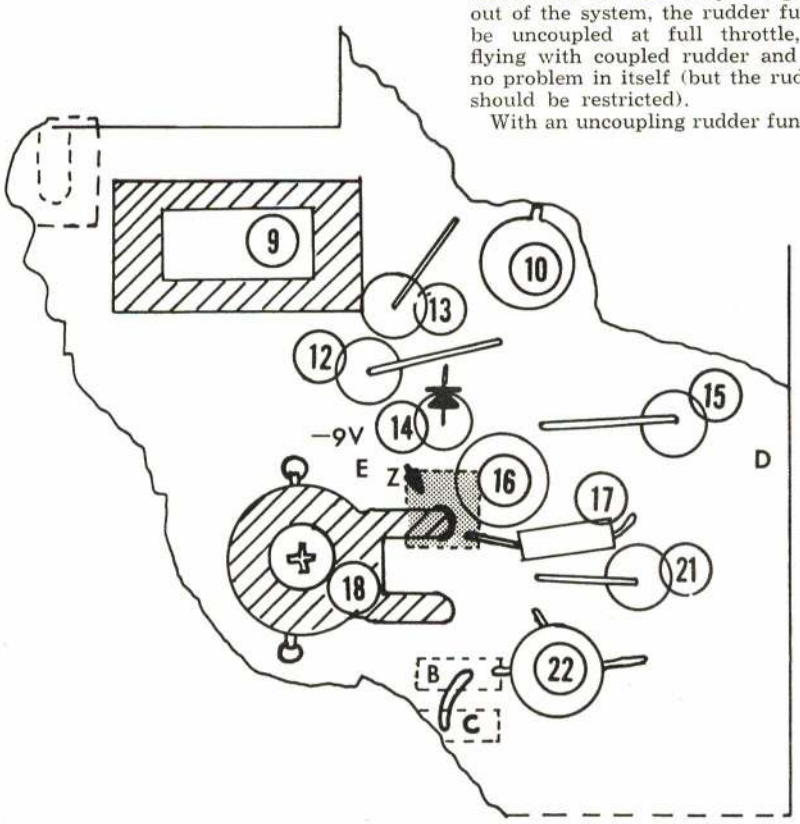


Fig. 5 **Contacts 2 and 5 from lever switch are joined and attached to land Z on encoder. Lands labeled B and C are jumpered. Elevator function is retained to avoid unsightly galloping and go-around servo hang-up.**

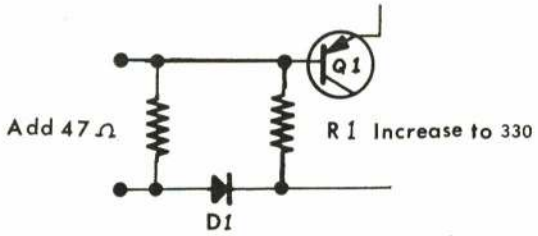


Fig. 6 **A larger tone-filtering capacitor and loading resistor may be needed on some receivers in front of voltage-dropping diode.**

JUNE 1969
MODEL AVIATION
Official magazine
A.M.A. NEWS
Academy of Model Aeronautics • 1239 Vermont Avenue N.W., Washington, DC 20005

The 1969 National Model Airplane Championships

Every year the world's biggest model meet — which is held in mid-summer — gets "put together" in mid-winter, at the annual Nats Planning Conference. This year's conference was held during two days, Feb. 18-19, at Willow Grove Naval Air Station near Philadelphia.

Fourteen leaders of the Academy of Model Aeronautics met with eighteen U. S. Navy officers (including representatives from Glenview NAS, Ill.; Lakehurst NAS, N. J.; Washington, D. C.) to work out the details of the 1969 meet: dates, event schedule, berthing, feeding, communications, field layout, transportation, manpower and material requirements, traffic control, contestant identification, spectator control, legal and insurance requirements, publicity, press support, model air show, model recovery, and many more.

How *does* the Nats get put together? Basically, the previous year's operation is adapted to fit the current site, dates available, and any new factors or lessons learned from the past — details are shrunk, expanded or otherwise changed to suit. **The basic operation has been developed over more than twenty years of AMA-Navy cooperation, so the procedure is well established.**

It begins with a general briefing as to what the Nats is all about, a tour of the station, group and individual meetings between AMA and Navy counterparts. The morning and early afternoon of the first day are taken up with studying the station and exploration of possible arrangements.

During late afternoon and well into the night the AMA representatives assemble by themselves to work out an event schedule tailored to the possibilities gathered earlier. This is where give and take by AMA officials, with many years of Nats experience, produces the basic plan. Hundreds of factors are considered during long hours of statistic reviewing, map studying, proposal making and debate over previous recommendations.

It takes about eight hours of concentrated effort (after the earlier meetings!) to hammer out the plan. Everybody gets a chance to suggest, argue, criticize or present his viewpoint. Decisions are made by vote of the Nats Executive Committee after most details are worked out to the general agreement of all present.

An example is shown by how the RC event schedule was developed. Ed Shipe (Calif.) and Bill Northrop (Delaware) had previously explored by mail (with some other prominent RC'ers) the desires of various RC interests. **It was immediately apparent that pylon racing would require more air time than before,** based on growing numbers involved in the activity, as compared with pattern flying. Yet more pattern contestants could be expected than ever before, due to the Nats location and a new maneuver schedule — from 120 to 150 entries were forecast.

Ed and Bill, together with AMA President John Patton (last year's RC event director), explored many possible event/hour combinations. Other committee members joined in when it became obvious that previous Nats schedules would not fit. **Further examination indicated that a fair apportionment of time would be 18 hours for Pattern, 12 for Pylon and 6 for Scale. The latter events were adaptable to these times, but pattern needed a new approach.**

In the end it was decided that it would be necessary to limit initial qualification flights to three per contestant. This alone would eat up twelve hours. The remaining six would then be used for a fifteen-man semi-finals, then a five man finals. It was acknowledged that Class A and B pattern enthusiasts would be disappointed, but it was obvious that the time available was insufficient, and the problems of dealing with different patterns would be excessive.

It was also obvious that RC is fast approaching the day when most flyers may have to enter all RC events at the Nats, as do free flight and control line contestants,

Official U. S. Navy Photograph

Principal representatives at the Feb. 17-18 Nationals Planning Conference at Willow Grove (Pa.) Naval Air Station. Standing, L to R: Frank Ehling, AMA Technical Director, Washington, D. C.; Ed Shipe, Nats RC Category Manager, Livermore, Calif.; Ron Morgan, Nats Contest Director, Scotland, Pa.; John Clemens, Nats PR Director, Dallas, Tex.; Earl Witt, Nats Contest Manager, Chambersburg, Pa.; Pete Sotich, Nats FF Category Mgr., Chicago, Ill. Seated, L to R: Bob Lopshire, AMA Junior Committee Chairman, Cochranville, Pa.; John Worth, AMA Executive Director, Washington, D. C.; Capt. Nick Brango, Commanding Officer, NAS Willow Grove; John Patton, AMA President, Frederick, Md.; Capt. Howard Soester, Nats Project Officer, NAS Willow Grove; Capt. Joe Katz, Staff Public Affairs Officer, NAS Glenview, Ill.

if they want a full week of flying. In fact it is already possible for an RC flyer to use the same airplane for Pylon, Scale and Pattern — probably not good enough to win all three events, but at least to get a maximum share of air time!

As a by-product of the Nats conference it was noted that running an RC meet for more than five days is a fantastic undertaking. **The Nats RC events comprise the world's largest RC meet, accommodating more contestants for more days than any other event, including the RC World Championships.**

Simultaneously with the RC planning, free flight and control line decisions were also being made. CL proved to be relatively simple, but FF required special consideration — mainly due to model recovery problems which have always been a major headache at Willow Grove.

If a wind develops, as it usually does, it tends to blow across the short dimension of the station. Flights over three minutes are almost always off the station and difficult to retrieve. **The Nats committee decided, therefore, to accept the recommendations of the National Free Flight Society and AMA's own FF Contest Board in limiting all "max" flights to three minutes. The committee also adopted a relatively radical fly-off procedure in case of ties, requiring progressively reduced engine runs (two second increments) for all extra flights.** These procedures will prevent new records from being set, but they should save many models and much chasing.

Indoor gets a special break this year — it may never be possible again — with two days available instead of the usual one. This made it possible to add Flying Scale as an official event, reduce total hours each day and still provide more hours per event than has usually been possible. Instead of flying one day from 9 am to 9 pm, the schedule calls for noon to 8 pm on the first day and 10 am to 5 pm on the second.

The two-day break resulted from the basic event schedule which runs from Wednesday through Sunday. The Navy can fully support only the latter five days. But it was agreed that we could use Monday and Tuesday, with a minimum Navy effort, keeping the field open to full-scale air traffic and using AMA personnel where necessary. This made it possible to start registration and berthing before the full competition schedule started.

It also made possible RC Pylon qualifying flights and RC transmitter processing on those two days. Pylon qualifying, besides requiring less personnel, facilities, and airspace — in comparison to pattern — could be run in an isolated part of the station without interfering with full-scale air traffic.

Following the long day and night of planning, AMA and Navy officials met again on the second day of the conference to sum up progress to date and schedule remaining loose ends for later followup during the months prior to the Nats. But, basically, the Nats was "set" at the end of the conference on Feb. 19.

The conference ended with a social hour at the home of the Commanding Officer, Captain Nick Brango. Together with the Project Officer, Capt. Howard Soester, and the staff Public Affairs Officer from Glenview, Capt. Joe Katz, it was generally agreed that a positive attitude and enthusiasm would be the Navy theme for this Nats.

It was snowing as the AMA party headed for home, but good spirit and satisfaction prevailed. There had been a feeling in Olathe, Kansas, a year ago, that the 1968 planning conference would be hard to top. But the Willow Grove people had done it, with tremendous cooperation and a "can do" outlook. **A great Nats operation has been turned on.**

U. S. Navy Photo

Captain Nick Brango, Commanding Officer of NAS Willow Grove, and John Patton, AMA President, look over the facilities to be available for operating the National Model Airplane Championships July 14-20, 1969. This will be the 22nd year the Navy has been host to the Nats.

Nats Entry Details

To enter in advance, by mail, entry forms must be postmarked no later than June 15. After that date, entry forms must be presented at the Nats, in person, and will be subject to substantial late fees.

Advance Basic Entry Fee: Junior and Senior AMA members — $2.00, includes two events; Open members — $10.00, does not include any events. **Additional events** (for all age categories) are $1 per event, except RC which are $5 per event.

Late Basic Entry Fee: Same as advance fee for Juniors and Seniors, $25 for Open members. **Additional events** (all age categories) are $3 per event, except RC which are $5 per event.

Event Additions at Nats for either late or advance entries: $3 per event, except $5 for RC events. **Note: no event additions after 9 pm on Monday, July 14.** No changes or substitutions of events may be made, nor will any refunds be made for any events not flown.

Mechanics fee, advance or late is $2. Provides identification and field access privileges equivalent to contestants. **Available to AMA members only.**

Note: Nats entry forms available upon request from AMA, 1239 Vermont Ave., N. W., Wash., D. C. 20005. Send stamped, self-addressed envelope for priority return.

Nats Housing, Meals. Unlike last year, when ample housing was available, it appears that only 500 housing berths will be available, for males only, in barracks aboard NAS Willow Grove. This is estimated to be less than the number who will want housing. Therefore, a system of housing priority will be used, with highest priorities going to contestants in the order of receipt of entry blanks; however, housing priority must be claimed by 2 pm Monday, July 14. There is no charge for housing, but no linens can be supplied — users must provide own sheets, blankets, towels, toilet articles, etc.

Meals are available to all contestants and mechanics, male and female, on a pay all at once basis: pay at time of registration. Costs: breakfast — 27c, supper — 45c (no lunch).

Camping and trailer area available, on station — no charge. Trailer units must be self-contained; no electricity or water on site. However, lavatories and showers will be available as near as possible.

Nats Junior Program Gets Maximum Effort

At the Qlathe Nats in 1968 an experimental youth program was tested successfully. An expanded version of that program is set for Willow Grove this year. In 1968, AMA Cub (originally known as the "Delta Dart") model kits were given away by the thousands, and hundreds of youngsters built and flew their first model airplane in competition at Olathe.

The same basic program is being held this July, but instead of being run in a remote corner of the station, it will be "down in front," in the main hangar at Willow Grove. Also, besides the AMA Cub event, three others will be held — hand launched glider and two ½A control line events. These four events are also being featured in the pre-Nats HIAA-AMA-Navy Regional Meet Program being held across the country from mid-May through June.

Thus a special Junior-only Nats will be in operation, in addition to the regular meet. It will be open to all youngsters in four age groups: up to 10, 11-12, 13-14, 15-16. No entry fees will be charged, and no AMA membership fee will be required. Prizes will be furnished by member firms of the Hobby Industry Association of America.

The program is being developed under the leadership of Bob Lopshire, Cochranville, Pa., chairman of AMA's Junior Committee. Further details will be reported in the next issue.

Nats Entry and Competition Schedule

Monday (July 14). Registration for all those pre-entered by mail — 8 am to 9 pm. **Housing Priority** must be claimed by 2 pm. **Late Entries and Event Additions** — 2 pm to 9 pm **this day only. Transmitter Processing for Form. I & II RC Pylon** — 8 am to noon. **RC Pylon Form. I & II Qualifying** — noon to 5 pm. **Indoor Rubber (Stick, Paper Stick and Cabin)** at Lakehurst Naval Air Station, N. J. — noon to 8 pm (entrants must first register at Willow Grove). **Transmitter Processing (Scale, Pylon and Pattern)** — 7 pm to 10 pm.

Tuesday (July 15). Registration only for those pre-entered by mail — 8 am to 5 pm. Those pre-entered by mail may also register Wednesday through Saturday, including housing if still available. **RC Pylon Form. I & II Qualifications** — 8 am to 5 pm. **Transmitter Processing (Scale, Pylon and Pattern)** — 7 pm to 10 pm. **Indoor HL Glider and Indoor Flying Scale** at Lakehurst NAS (entrants must first register at Willow Grove) — 10 am to 5 pm.

Wednesday (July 16). FF B Gas, Nordic Glider and FF Flying Scale — 8 am to 5 pm. **CL Op. Rat R., Sr. Stunt, A Speed, FAI Speed and Jr. Combat** — 8 am to 5 pm. **RC Flying Scale** — 8 am to 11 am. **Pattern Qualifying**—11 am to 5 pm. **Transmitter Processing (Scale, Pylon and Pattern)** — 7 pm to 10 pm.

Thursday (July 17). FF ½A Gas, Wakefield Rubber and Helicopter — 8 am to 5 pm. **CL Sr. Rat Race, Jr. Stunt, B Speed and Open Combat** — 8 am to 5 pm. **RC Scale** — 8 am to 11 am. **RC Pattern Qualifying** — 11 am to 5 pm.

Friday (July 18). FF A Gas and Rocket — 8 am to 5 pm. **CL Jr. Rat Race, Open Stunt Semi-Finals, C Speed, Jet Speed, B Proto Speed and Sr. Combat** — 8 am to 5 pm. **RC Pattern Qualifying** — starting at 8 am, to be followed by **RC Pattern Semi-Finals** — to 5 pm.

Saturday (July 19). FF FAI Power and HL Glider — 8 am to 5 pm. **CL Open Stunt Finals, ½A Speed, ½A Proto Speed, Jr.-only ½A Profile Proto, CL Scale and Navy Carrier (I, II and Profile)** — 8 am to 5 pm. **RC Pylon Form. I & II Finals** — 8 am to 2 pm. **RC Pattern Finals** — 2 pm to 5 pm.

Sunday (July 20). FF C Gas and Unlimited Rubber — 8 am to 2 pm. **CL FAI Team Race** — 8 am to 2 pm. **Jim Walker Stunt Finals** — 1 pm to 2 pm. **RC Pylon Form. I & II Finals** — 8 am to 2 pm.

Turn-in deadline times for models needing scale judging (they may be turned in earlier; however, only control line scale models are scale-judged before flying).

RC Pylon Form. I — by noon Wednesday
RC Scale — by 2 pm Thursday
CL Scale — by 1 pm Wednesday
FF Scale — by 7 pm Wednesday

Record Reviews

A report of selected recent record holders highlighting the designs and equipment used.

CL Navy Carrier Class I national AMA record, Junior age class: 468 points, established by John Gerber, Laureldale, Pa., on August 25, 1968.

Photo by Don Mohr

John's airplane was a Martin MO-1 which was designed for model use by his father, Donald H. Gerber. A letter from the Martin Marietta Corp. indicates that the MO-1 was carrier-based along with the bombing and torpedo squadrons of the U. S. Navy in 1924, but was classed as a lightweight scout monoplane.

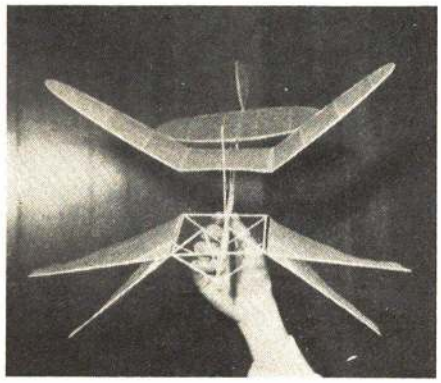
Power of the 28" span, 26 oz. model was provided by a K & B 40 modified for clockwise rotation. Accordingly, it swung a left-handed homemade prop of 8" diameter, 9" pitch. The engine modification, including the exhaust slide and fuel metering for engine speed control, was done by Bill Johnson. Engine used a Fireball regular plug and homemade pressure tank.

According to the record holder, construction of the model is very simple due to its solid wing and box-type fuselage. Model was made from Sig balsa, covered with Sig silk and finished with Aero Gloss dope. K & B wheels were used as was the J. Roberts control system in conjunction with Bill Johnson's "Custom-Deluxe" bellcrank.

CL Navy Carrier Class II national AMA record, Junior age class: 463 points, established by John Gerber, Laureldale, Pa., on August 25, 1968.

This model, also the Martin MO-1, but of 36" span and weight of 3¼ lbs., was powered by a Rossi 60. The engine was modified for clockwise rotation and speed control by Bill Johnson, similar to the above-listed record; other equipment used was the same, except that this model used an original 2-line system in conjunction with a Hot Rock control handle and a 10"D x 8"P left-handed prop.

Ornithopter, Outdoor Rubber-Powered, national AMA record, Junior age class: 3 minutes, 21 seconds, established by Robert Postage, Wireton, Pa., on August 8, 1968.



This model was an original design with flapping vanes powered by two strands of 7/64" Sig contest rubber of 24" length, Sig rubber lubricant. Model has a wingspan of 13½", 4" major chord; stabilizer span of 9½", 4½" major chord. It was made from Sig balsa, covered with condenser tissue. The model weighed 5 grams.

Indoor FAI Stick national AMA record, FAI Ceiling Cat. I, Open age class: 17 minutes, 54.8 seconds, established by Harold L. Crane, Hampton, Va., on December 29, 1968.

Crane indicates that his own design 25.5" span model, at .07 oz., is heavy for typical standards. It was powered by two strands of .06" x 15" Pirelli rubber (from Zaic) in conjunction with a prop of 18.6" dia., 33" pitch. The low aspect-ratio design with wing mounted off-center has an unusual "stability augmenter," barely visible in the photo; this gives added stabilibzer area to the left stab tip. Both wing and stab had an airfoil cambered 5% at 40% of chord. The model was built from Micro-Dyne balsa, covered with Micro-X slack microfilm. Two stick steers for drift control were required during the record flight.

Helicopter, Indoor Rubber-Powered national AMA record, Ceiling Cat. I, Open age class: 6 minutes, 55.9 seconds, established by Thomas Vallee, Laurel, Md., on December 28, 1968.

The model design was based on one by Bill Bigge which was published in the 1959-61 Zaic Yearbook. Of corkscrew type,

it was redesigned for simpler handling, according to Vallee. Essentially all rotor (12" span, four blades) and motor stick, it weighs .016 oz. Power was supplied by a 9½" loop of Sig Pirelli .043". The rotor spars and ribs as well as the motor stick were made from Micro-X indoor wood. The rotor was covered with Micro-Dyne microfilm.

Tom says that his helicopter is a real fun model — easy to build and can be flown almost anywhere. "It was built for fun and to gain helicopter experience. The record was a happy and unexpected afterthought."

Vallee subsequently exceeded his own record with a flight of 7 minutes, 14.8 seconds, on February 19, 1969. The same model was used for both records.

Indoor B Stick national AMA record, Ceiling Cat. I, Open age class: 17 minutes, 13.5 seconds, established by Thomas Vallee, Laurel, Md., on December 29, 1968.

Vallee's model, an original design, had a projected wingspan (mounted off-center) of 25.25", 4" major chord, broad elliptical tips, tip dihedral. Stabilizer, of elliptical planform, had 12" span, 4" center chord. Airfoil of both wing and stab was a smooth curve having a high point at 40% chord. Model weighed .026 oz.

Propeller used was a mono-spar design of 15" dia., 25" pitch, powered by a 12" loop of Sig Pirelli home-stripped to .050" size. Lube was a glycerine-green soap mixture.

Tail boom of fuselage was constructed using a Micro-X form; prop spars were cut from Sig contest balsa; Micro-Dyne spar stock was used in wing; remainder of model was built from Micro-Dyne and Micro-X indoor balsa. Vallee covered the model with Micro-Dyne microfilm, used a Sig 16-to-1 winder.

On the record flight the model hit an isolated spot of turbulence near the ceiling, causing a power stall; the model recovered in ground-effect just above the floor, then climbed back to the ceiling; model landed dead-stick.

Willpower, Work, Secures Flying Field for Baltimore Area Club

"Community enthusiasm and cooperation, plus a year's hard work, have created a park that is not only one of the few multi-use neighborhood parks in the metropolitan area, but is also the only place in the state where model airplane and rocket flyers can find facilities designed especially for them," began a half page story in the November 17 issue of *The Baltimore Sun* Paper.

Members of the AMA chartered Flite Streaks Model Aeronautics Club spearheaded this major project together with the Youth Committee of the Greater Dundalk Community Council. First Step was the securing of a tract of land for which the Youth Committee was instrumental; then, because it was marshy and wooded, it had to be cleared, filled and graded before even one flight could be made. The land, a large site of ten acres, was made available by a local industry (which wished to remain anonymous) for a small rental fee, "just enough to make it legal," said Joseph Thomas, Sr., president of the Flite Streaks.

Located near the junction of North Point Blvd. and Wise Ave. in the Dundalk area of Baltimore, Md., the area has been named Skyview Model Recreation Park. Appropriately named it is, for playground equipment and picnic tables have been installed in addition to four control line circles (two black-topped), areas for radio control and model rockets, and access for RC seaplanes and model boats.

The group sought help from local industries, business and the general public. "We were blessed right from the word, go," said Thomas. "We got bulldozers, dump trucks, grass cutting machines, and front-end loaders from local industries, and we even got road graders from the Army." Other donations included pipe and cable for fencing, bricks and mortar for columns at the entrance, flags and flag poles, black-top (installed) for two control line circles, playground equipment, 15 picnic tables loaned by Baltimore County Recreation and Parks, an eight-foot lifeboat for the pond, and much more . . . even the use of a room of a nearby restaurant for club meetings.

"We are proud of our park, and we would like AMA members all over the United States to know how, with a little willpower and a bunch of guys who are not afraid of a little work, every club can get a good flying site if they just try hard enough." These encouraging words come from the president of the Flite Streaks.

RC World Champ Team Selection for '71— Opinions Sought

The 1971 FAI RC Team Selection Committee, at press time, was making final revisions to a questionnaire to be distributed to competition-minded RC'ers in an effort to determine the most practical program to use for the U.S. Radio Control World Championship Team selection in 1971. Tom Rankin, committee chairman, indicates that, basically, there appears to be two possibilities: a combined Nats/FAI Elimination (similar to the Olathe Nats program of 1968) or a separate FAI Elimination similar to that held in Oklahoma in 1966. **The committee seeks an indication of preferences,** especially from possible competitors and workers. The committee also wants an expression of whether there should be prequalification meets and, if so, how the prequalification program should be conducted.

Rankin points out that the committee will be considering whether the FAI pattern, as opposted to the AMA pattern, would be preferable if a combined Nats/FAI Elimination is utilized (keeping in mind that the WC will be by the FAI rules) — also that the committee must evaluate how much time entrants may have to attend either one or two major competitions (each of which might require a week) and give thought to the logistics of handling either a combined Nat/FAI Elimination or a separate FAI Elimination.

Direct your opinions on these and other possible considerations to the secretary of the FAI RC Team Selection Committee: Betty Stream, 3966½ Studebaker Rd., Long Beach, Calif. 90808.

Other committee members, in addition to Chairman Tom Rankin (Md.), are Dave Burt (Ill.), Alex Chisholm (Calif.), Randy McGee (Okla.), Cliff Piper (N.H.), Paul Good (Ariz.) and Bill Kempton (Wash.)

AMA CLUBS HAVE INSURANCE TO PROTECT FLYING SITES!

1969 AMA-HIAA-NAVY Regional Meet Jr. Program

An exciting opportunity is about to be at hand for youngsters throughout the country to be introduced to model airplanes and have an exhilirating taste of competition. From mid-May to the end of June, Regional Meets are scheduled which are especially designed for young people who have not previously flown models in competition. Event rules for these models are intentionally different from conventional AMA competition rules inasmuch as the special rules are intended to encourage maximum flying with the use of ordinary techniques and equipment, rather than refined competition techniques and special equipment. Also, small flying fields, nearby to metropolitan areas, may be used.

The number of Regional Meets scheduled for 1969 — twenty — is nearly doubled from last year's eleven. This provides the opportunity of participating to many more youngsters. The program is directed by the Academy of Model Aeronautics, sponsored by the Hobby Industry Association of America and, wherever possible, hosted by the U.S. Navy.

HIAA manufacturers, wholesalers and dealers are cooperating with the program by providing awards, funds and promotional support. AMA Contest Directors and chartered clubs are providing technical direction and operation of the meets. The U.S. Navy is assisting by providing many meet sites and publicity support.

Who May Compete?

Any youngster up to age 16 may compete in one of the AMA-HIAA-Navy Regional Meets. There are no entry fees, and entrants are *not* required to be AMA members.

Does Everyone Compete Together?

No. There are four age categories: up to 10, 11-12, 13-14 and 15-16.

What Are the Prizes?

Top entrants in the various events in each of the four age classes will receive medals and/or plaques *and* model airplane merchandise for awards. In addition, each meet champion will win a trip to the National Model Airplane Championships at Willow Grove Naval Air Station, Pennsylvania.

What Kind of Events are in the Program?

Each of the twenty Regional Meets will have events consisting of both control line and free flight. There will be three model events at each location which will be chosen (depending upon flying site conditions and local interest) from a list of two control line events and two free flight events.

What Are the Specific Rules for the Four Events?

AMA Cub. Models must be unmodified, as kitted by Sig. Mfg. Co. Kits may be obtained from many hobby shops, and many meet directors will have kits available and facilities for building them right on the field! Plastic prop and ⅛" rubber, as supplied in the kit, must be used. May be flown indoors or outdoors depending upon facilities available. The winner will be the flyer of the model which stays in the air the longest during any single flight.

Hand-Launched Glider. Either indoors or outdoors, as per AMA Cub event. Gliders

Key officials involved in planning the 1969 HIAA-AMA-Navy Regional Meet Junior Program during the Hobby Industry Association of America Trade Show last January were (clockwise, from left) Marty Namm, HIAA PR officer; John Worth, AMA Executive Director; Walt Schroder, Model Airplane News; Frank Garcher, Midwest Model Products; Bob Veir, Chairman Model Aeronautics Div. of HIAA; and Capt. Joe Katz, Staff Public Affairs Office, NAS Glenview. Also participating, but not shown, were Johnny Clemens, Nats PR Director, and Norm Ward, American Aircraft Modeler. Photo below shows Mark Ashton launching his AMA Cub, one of the events of the program, during the 1968 Southwest Regional Meet at Dallas NAS. Timer is Bill Lank, AMA district VIII V.P.

Dallas News Staff Photo by Richard Pruitt

may be of any design, homebuilt or ready-to-fly commercial manufacture, of all balsa construction and with wingspan of not over 12 inches. The winner will be determined the same as for the AMA Cub event.

Control Line ½A Profile Proto. AMA rules in general, with modifications. Minimum wingspan 14″ for monoplanes; 12″ for biplanes. Fuselage must have a minimum length of 12″ and resemble a full-scale aircraft in side view. Engine, fuel tank and control system shall *not* be cowled or enclosed. A conventional 2-wheel landing gear is required. Maximum engine displacement is .051 cu. in. Models must be equipped with two metal control lines of 35 feet minimum length. Minimum wire diameter of each line is .008″. Model is timed from the instant of release for takeoff and continues until ten laps are completed. Lowest single flight time wins. Flying from a pylon is not required. No whipping of the model is permitted.

½A Solo Race. Any kind of control line model is permitted, including plastic ready-builts, which has an engine with stock factory-equipped fuel tank and displacement not over .051 cu. in. Control line requirements are the same as for ½A Profile Proto event. The event has elements of team racing, being flown against the clock, but only one plane at a time is flown, and the entrant, who must be the pilot, must also do all engine starting and refueling. Number of laps to be timed is 48 (2 miles), during which the model must land, be refueled and restarted at least once. One point will be awarded for each mile per hour of average speed for the total 48-lap period. In addition, up to 10 points will be awarded for the smoothness of the initial takeoff, and up to 10 points for the smoothness of the first landing. The highest total number of points for one flight will determine the winner.

General Rules for All Events. No limit to the number of flights per contestant during the announced time for flying the event. Next-best flights will be used for breaking ties should they occur.

Only in the Hand-Launched Glider and ½A Solo Race events are commercially produced ready-built models allowed. All other models must be constructed by the contestant. Any model, including ready-builts, entered by one contestant may not be flown by any other contestant; however, a contestant may fly a model in more than one event if the model complies with the rules for more than one event.

Except as modified by these special rules, applicable AMA rules may be applied by the Contest Director.

General Rules for Control Line Events. Two steel or metal control lines of equivalent strength, which must not include swivels as a part of their construction, are required. The lines must also be free of any rust or kinks. The length of the control lines is measured from the center of the control handle to the center of the model. Before each flight there will be a pull-test performed equal to 100 pounds per cubic inch of engine displacement (a .05 cu. in. engine would require a pull of 5 pounds). The pull test will be performed on the entire control system simultaneously, including handle, control lines (all connections), linkages and system attachments to the model (and its control surfaces).

Where Is the Nearest Regional Meet?

Publication schedules required this copy to be prepared before the list of the twenty Regional Meets was finalized. If finalized in time, the list will be printed on the AMA News Extra page. If not, contact your nearest hobby dealer or write (enclosing a self-addressed, stamped, return envelope) to: AMA HQ, 1239 Vermont Ave., N. W., Washington, D. C. 20005.

Sterling Models Sponsors National Award for Scale

1969 is the year of the first Sterling Models Annual Award for the Best Scale Model in National Competition. The award, a specially designed perpetual trophy plus $100 cash and a smaller trophy for the winner to keep, is established by Sterling Models on a ten-year basis, to be administered by AMA. Rules for awarding the prize place emphasis on the model's fidelity to scale and workmanship, as only static judging is employed in scoring.

Models entered in any scale category of the National Model Airplane Championships — radio control, free flight or control line — are eligible and are automatically scored for this special competitition. The winner of the Sterling Models Award will be the Nats scale entrant whose model receives the highest static judging points, provided that his model completes an official flight as stipulated by the category-event rules. Flight points are not used in determining the winner.

"Although our company has been a substantial and consistent supporter of the Academy and the Nationals for more than a score of years now," said Ed Manulkin speaking for Sterling Models, "I felt that the time had come for myself, personally, and my company to establish an additional incentive for model builders everywhere to join the Academy and help to create the truly golden age of modeling, now in sight."

Going on, Manulkin said, "A strong, active and resourceful membership will insure a continuous flow of ingenuous developments by the modeler, which will most assuredly reflect in a fine citizenry for our country, and also provide a tremendous reservoir of top technical personnel so badly required today in the aerospace field. They will be needed even greater in the future, for not only our country, but literally for world progress."

The BIRDS: 1959-1969

The BIRDS are 10 years old, and they're just about 10 times stronger as a club than they were that first year. How come?

They went through the same set of growing pains as any other club, and there were times when many would have been happier taking up lawn bowling or some other less heartbreaking hobby, if it hadn't meant giving up the friendship of wonderful guys. There were times when the club was down to running on a couple of tired cylinders, usually brought about because some flash-in-the-pan that was a great guy on the flying field failed to hold up his end as a member of the executive board. This sort of failure has spelled the doom of many fine clubs, because somebody isn't found to step into the breach. So — clubs can fail because of people — and it's people that go together that make a fine, strong club like the BIRDS.

Several years ago the BIRDS executive committee was changed to its present form, setting up a nine member board, each to serve a three-year term, with three being replaced each year. Not only does this system give a broader base of talent to choose from, it also reduces the effect of the loss of a member to a very small percentage. Each year the president selects a nominating committee whose job includes interviewing prospects to determine that they are sincerely interested in accepting the responsibility of office. These prospects, plus any nominated from the floor (but only

with the nominees permission) are then voted on by the membership. The three newly elected officers and the six incumbent members of the executive committee then meet in one of the few closed board meetings and, among themselves, select one of their number to be the president. This man then selects his staff of officers for Ways and Means, Program, Membership, Secretary, Treasurer, Contest Director, Field Director, etc. This method has one major feature — the opportunity to "groom" a man for the office he will be asked to fill in a year or two, but at the same time there will rarely be a time that a member of the board won't be around to step into a job if someone fails to make it to a meeting.

Since people are the key to success, it follows that a strong, well-run club will attract more people to it, and this has been the real strength of the BIRDS. They represent a tremendously diversified number of occupations, and with this great pool of talent from which to draw, they can call on an expert in almost any field. It has been truly wonderful the way each fellow has pitched in and done his job for the club.

There is one more big bonus that shows up in that sort of climate. IDEAS. They offer ideas for programs, ideas for contests, ideas for making the field better, ideas for making the hobby better, safer, more fun, or more wide-spread. So many great ideas have come forth that over the past 10 years, the BIRDS have become known as innovators. Did you know that the universally accepted practice of frequency-flag identification was a BIRD Club FIRST? Did you know that the BIRDS sent in the first $100 to start the AMA Frequency Fund Drive? Did you know that the BIRDS were running noise level tests with home-built mufflers before the AMA started its Muffler Committee, and that the AMA absorbed the BIRDS correspondence on the subject to further their knowledge of manufacturers views on the subject? Did you know that the BIRDS were the first club ever to send out formal, individual announcements of their contest? That the BIRDS were charter members of the Southern California Council of Radio Control Clubs (SC2RC2), because it was realized that the only way modelers could come up with any political strength was through weight of numbers.

There have been many other firsts, too, all of which add up as a tribute to the wonderful people who go to make up such a great club. Somehow they have risen above the petty differences of opinion, the picky-picky politics that usually end up tearing a club apart. Somewhere along the way the BIRDS have learned how to keep such things in their proper perspective, and as a result, one man with a good idea can sway 200-plus people, but one sour note doesn't destroy the harmony.

The foregoing was excerpted from a report by a past BIRDS president, Andy Foster. To complement the story the BIRDS relationship with AMA is significant.

The BIRDS club is AMA's largest chartered club (234 members in 1968!). BIRDS officers have frequently been prominent in AMA national affairs. For example:

Andy Foster — AMA Muffler Committee
Eldon Lind — RC Director, 1967 Nats
Betty Stream — Secretary, 1971 FAI Team Selection Comm.
RC Staff, 1967 & 1968 Nationals
Cliff Weirick — AMA President, 1967-68

What about the future? The BIRDS are not resting on past laurels, as shown by a recent statement from current President Bror Faber: "We will probably see an increase in air show activity, particularly as we gain a bit more reputation. In our 10th Anniversary year of 1969 we already have three scheduled with perhaps more to come. They are a lot of fun and gain us a good bit of goodwill and publicity."

Above: BIRDS members Andy Foster (left) and Eldon Lind (right). Club members turn out in force whenever they go to a contest. Shot below is from 1968 Winter Nationals at Tucson, Ariz.

Proto Speed Sidewinders Okay, New CB Chairman

In one of his last acts as chairman of the Control Line Contest Board, Howard Mottin polled the board on a request for interpretation of rule paragraph 6.16. The question was whether the realism criteria was met by a sidewinder-type design (described simply as a conventional proto fuselage laid on its side or as a one-sided, asymmetrical, "apple-cheek" cow). The CB responded by saying that, "It is the concensus of the 1969 Contest Board that "sidewinder" type Proto Speed designs *are acceptable* in regards to rule #6.16. The sidewinder design may be asymmetrical, but the area of the cowl forward of the wing leading edge junction will not be considered wing area. This ruling is effective immediately."

New chairman of the Control Line Section of the AMA Contest Board is Laird G. Jackson, M.D., 5415 Houghton Pl., Philadelphia, Pa. 19128. Dr. Jackson replaces Howard Mottin as chairman; however, Mottin continues to represent Dist. VII on the CB.

Nats RC Scale

The Federation Aeronautique Internationale (FAI) rules for Radio Control Scale will be used at the 1969 Nats instead of the AMA rules, except that the top limits specified in the AMA rules for engine displacement and model weight will apply. (FAI rules limit displacement to .61 and weight to 11 pounds, while AMA rules permit displacement up to 1.25 cu. in. and weight up to 20 pounds.) The FAI RC Scale Rules were printed in the October 1968 *American Aircraft Modeler*, and they also are in the 1969 AMA rule book, page 60. The rule book governs, as it was updated to include late-year FAI actions.

AMA officers made the decision to use the FAI RC Scale Rules in order to be in a position to use the results in determining team members for the possible first RC Scale World Championship in 1970. While such a championship has not been firmly established, it appears imminent inasmuch as France has offered to host it.

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

May 3-4 — Taft, Calif. (AA) SHOC Annual FF Meet. Site: Gardner Field. J. Tischler CD, 1306 Kings Ct., Anaheim, Calif. 92804. Sponsor: **Sky Hoppers of Orange County.**

May 3-4 — High Point, N. C. (AA) High Point Model Air Meet for CL. Site: Spinners Flying Field. L. Underwood CD, 1507 Whitehall St., High Point, N. C. 27262.

May 3-4 — Dallas, Tex. (AA) 4th Annual Dallas RC Club Contest. Site: North Lake City Park. C. Summers CD, 7132 Shook Ave., Dallas, Tex. 75214. Sponsor: **Dallas RC Club.**

May 4 — Queens, N. Y. (AA) Luftmeister Custom Tailored Slo Combat Meet. Site: Flushing Meadow Park. M. Salvador CD, c/o 131-30 223 St., Laurelton, N. Y. 11413.

May 4 — Wichita, Kans. (AA) 2nd Annual Wichihawks Spring Rally for FF & CL. Site: Wichita Modelers Council Field. J. Mason CD, 2214 S. Pinecrest, Wichita, Kans. 67218. Sponsor: **Wichihawks.**

May 4 — Dayton, Ohio (A) Mid-American Model Aviation Assoc. 1000 Lap RR Meet. Restricted. Site: Municipal Flying Circles. J. Martin CD, 551 Aberdeen, Ketering, Ohio 45419. Sponsor: **Dayton Buzzin Buzzards.**

May 4 — Council Bluffs, Ia. (AA) Annual Spring Goodyear & RR Contest. Site: Iowa School for Deaf. D. Hutcheson CD, 317 Spencer Ave., Council Bluffs, Ia. 51501. Sponsor: **Balsa Busters.**

May 4 — Marysville, Ohio FF Team Qualifying Trials. Site: Airstrip & Lee Farm. F. Miller CD, 1313 Brookridge Dr., Columbus, Ohio 43220. Sponsor: **Central Ohio FF Club.**

May 4 — Dallas, Tex. (AA) Annual Mother's Day FF Meet. Site: Great Southwest Site. C. Hornbeck CD, 3506 Duchess Tr., Dallas, Tex. 75229. Sponsor: **Dallas Cloud Climbers.**

May 10 — Tulsa, Okla. FAI Indoor Quarter Finals. Site: A.N.G. Hangar. B. Hanford CD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145. Sponsor: **Tulsa Glue Dobbers.**

May 10-11 — Tulsa, Okla. Indoor Record Trials, Cat. II. Site: A.N.G. Hangar. B. Hanford CD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145. Sponsor: **Tulsa Glue Dobbers.**

May 10-11 — Amarillo, Tex. ARKS RC Fly In. Site: Fair Grounds. H. Dickson CD, 1501 W. 48, Amarillo, Tex. 79110. Sponsor: **Amarillo Radio Kontrol Society.**

May 10-11 — Memphis, Tenn. (AA) MRCC Pylon Race. Site: Club Field. L. Hord CD, 5050 Poplar, Suite 319, Memphis, Tenn. 38117. Sponsor: **Memphis RC Club.**

May 11 — Marysville, Ohio FF Team Qualifying Trials. Site: Lee Farm & Airstrip. F. Miller CD, 1313 Brookridge Dr., Columbus, Ohio 43220. Sponsor: **Central Ohio FF Club.**

May 11 — Urbana, Ill. (AA) Midwestern RR Championships. Site: Illini Airport. J. Fruit CD, 406 E. Newkirk, Tuscola, Ill. 61953. Sponsor: **Champaign-Urbana Aeronauts.**

May 11 — Richmond, Va. Brainbusters FF Qualifying Trials. Site: Curles Neck Farm. R. Lynch CD, 742 Tanbark Dr., Newport News, Va. 23609. Sponsor: **Brainbusters.**

May 11 — Great Southwest, Tex. FAI FF Qualifying Trials. Site: Country Rd. & Chapel Rd. W. McCormick CD, 4612 Pleasant St., Ft. Worth, Tex. 76115. Sponsor: **Ft. Worth Planesmen.**

May 17-18 — Skaggsville, Md. DCRC 12th Annual Technical Symposium on RC. Site: John Hopkins Univ. Applied Physics Lab. J. Spalding CD, 5803

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AMA News Extra .....

NOMINATION PROCEDURES APPROVED BY COUNCIL

Nomination procedures are to be spelled out in advance, according to a new ruling by AMA's Executive Council. Publication of the procedures at least ninety days before the Nominating Committee meets is now required. The new policy was approved at the February 28 meeting of the council, as were several other nomination details.

Minimum standards for elected AMA officers have also been raised. Previously it was enough that candidates were Leader members of the Academy. This is what the by-laws call for. But it is now required that any candidate for national office (president or secretary-treasurer) must also have served, or shall be currently serving as either: elected officers of the Academy (such as vice-president) or as officers appointed by the president or the vice-presidents (such as Contest Board members or committee chairmen).

For elected district officers (vice-presidents) the same requirements are applicable, or either of two others may be substituted: Leader members recommended by vote of an AMA chartered club, or by a current Contest Director.

Names of all qualified candidates must be submitted in writing prior to the start of the Nominating Committee meeting. All such names will be considered by the committee, but only two names per office will be approved by the committee for listing on the ballot. The ballot, however, will provide for write-in votes for any additional candidates who meet the requirements. Candidates are also urged to submit in advance, to the committee, any statements, documents or evidence supporting their nomination.

The 1969 Nominating Committee meeting will take place on Wednesday, July 16, 8 pm, at the Willow Grove Naval Air Station--the meeting place to be posted on the official National Meet bulletin board in the contestant hangar. Note: the Nominating Committee is made up of the elected district vice-presidents or their designated representatives.

At the February council meeting a proposal for a two-stage election procedure, to include a primary ballot, was considered but not voted upon. It was generally agreed that the current nomination procedure was basically sound and should be continued, but that details should be defined and publicized in advance to minimize misunderstandings. It was also noted that the two-stage election process would require a by-laws change, and that it could not be applied to the 1969 election.

It was agreed, therefore, that the current nomination procedure shall be as stated here, at least for 1969. It was also voted that an addition to the by-laws be submitted for Leader member vote, essentially as follows: add to Article IX (see '69 rule book) that nomination procedures shall be in accordance with a council-approved official Nomination Procedures document, and that this document shall be published at least 90 days prior to the annual Nominating Committee meeting. (Note: for 1969 this will serve as the advance official notice--published at the earliest opportunity.) Until the Leader member vote is taken on this by-laws change (in the fall as part of the 1969 election) the foregoing will serve for the same purpose this year.

Meanwhile, the time is NOW to consider and submit names for the 1969 election. This election will be for the national position of secretary-treasurer and the vice-president positions for districts I, III, V, VII, IX and XI. Names may be submitted by any AMA member, in writing with a statement of at least 100 words concerning the candidate's qualifications, to the member's district vice-president, with a copy to AMA HQ. Consent of the person named should be obtained prior to submission.

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.

DIRECTORY OF AMA OFFICERS

Which officers live in your district? Select correct address when writing officers.

EXECUTIVE COUNCIL

President:
John Patton, Route #5, Frederick, Md. 21701
Secretary-Treasurer:
Earl Witt, Longview Trailer Court, R.D. #3, Chambersburg, Pa.
Executive Director
John Worth, c/o AMA Hq., 1239 Vermont Ave. N. W., Washington, D. C. 20005
Vice Presidents
I: Cliff Piper, Highland Road, Atkinson, N. H.
II: A. Schroeder, 18 Spencer Rd., Glen Ridge, N. J.
III: Eva Biddle, 2156 Street Rd., Warrington, Pa.
IV: C. Telford, 8612 Rayburn Rd., Bethesda, Md.
V: Jim Kirkland, 344 Edge Ave., Valparaiso, Fla.
VI: Gosta Johnson, 6810 S. Crandon, Chicago, Ill.
VII: Jack Josaitis, 23663 Lawrence, Dearborn, Mich. 48128
VIII: William Lank, 9903 Witham, Dallas, Texas
IX: Stan Chilton, 446 Ida, Wichita, Kans.
X: Vic Cunnyngham, Sr., 4337 Hornbrook St., Baldwin Park, Calif. 91706
XI: R. D. Stalick, 2807 S. Oak St., Albany, Ore.

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M. Weisenbach, 4568 West 146th St., Cleveland, Ohio 44135 (West)
IV: D. L. Johnson, 3367 Sudlersville So., Laurel, Md.
V: T. McLaughlan, 4140 Fern Ct., Pine Glades, Pensacola, Fla. 32503
VI: Wheland Webb, 15722 Vine Ave., Harvey, Ill. 60449
VII: Odell Marchant, 2004 N. Hillsboro, Minneapolis, Minn. 55427 (North)
W. Hartung, 14759 Kilbourne, Detroit, Mich. 48213 (South)
VIII: M. Frank, 2933 Blankenship, Wichita Falls, Tex. 76308
IX: R. R. Combs, RR #1 Box 712, Morrison, Colo.
X: D. C. Farnsworth, 301 Carl Dr., Visalia, Calif. 93277 (North)
Pete Brandt, 5817 W. Ironwood, Palos Verdes Peninsula, Calif. 90274 (South)
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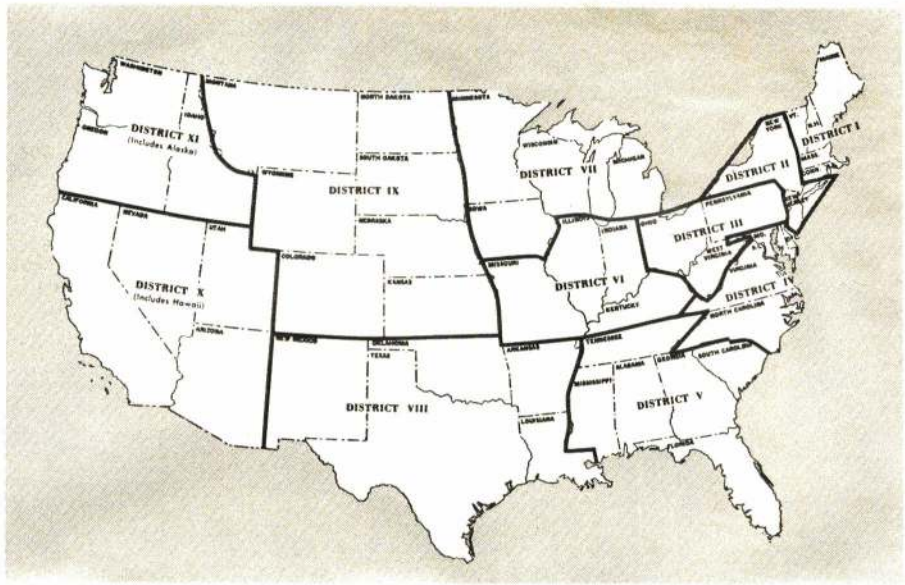

Contest Calendar

Continued from page 46

Ellerbie St., Lanham, Md. 20801. Sponsor: **DCRC Club.**

May 17-18 — Albuquerque, N. M. SWAT Record Trials for FF. Site: Boy's Academy. J. Bicknell CD, 12329 Princess Jean N.E., Albuquerque, N. M. 87112. Sponsor: **South West Aero Team.**

May 17-18 — Tulsa, Okla. FAI FF Qualifications. Site: TGD Field. B. Hanford CD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145. Sponsor: **Tulsa Glue Dobbers.**

May 17-18 — Tulsa, Okla. Outdoor FF Record Trials. Site: TGD Field. B. Hanford CD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145. Sponsor: **Tulsa Glue Dobbers.**

May 17-18 — Jacksonville, Fla. (AAA) Rebel Rally for FF, CL & RC. Site: White House Naval Field. W. Lyle CD, 1908 Holly Oaks Ravine Dr., Jacksonville, Fla. 32211.

May 18 — Marysville, Ohio (AA) Canton Model Society FF Meet. Site: Lee Airport. W. Hulbert CD, 174 Castle Blvd., Akron, Ohio 44313. Sponsor: **Canton Model Society.**

May 18 — Denver, Colo. (AA) Model Museum Spring Old Timers 7th Annual FF Meet. Site: East Colfax Site. T. Dannels CD, 1265 Yates, Denver, Colo. 80204. Sponsor: **Model Museum Flying Club.**

May 18 — Hastings, Minn. Mpls. FAI FF Qualifications. Site: Webers Flying Field. D. Monson CD, 131 W. Wentworth Ave., W. St. Paul, Minn. 55118. Sponsor: **Minneapolis Model Aero Club.**

May 18 — Hastings, Minn. (AA) Minneapolis MAC Annual Spring FF Meet. Site: Webers Flying Field. D. Monson CD, 131 W. Wentworth Ave., W. St. Paul, Minn. 55118. Sponsor: **Minneapolis Model Aero Club.**

May 18 — Creve Coeur, Mo. Spirits & Signal Chasers Challenge Meet. Restricted. R. Williams CD, 4060 Bondurante Dr., Bridgeton, Mo. 63042. Sponsor: **Spirits of St. Louis RC.**

May 18 — Fresno, Calif. (A) Fresno Monthly FF Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr. W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

May 18 — Queens, N. Y. (AA) Forest Park MAC 1st Annual CL Meet. Site: Flushing Meadow Park. F. Howard CD, 91-18 108 St., Richmond Hill, N. Y. 11418.

May 18 — Elsinore, Calif. FAI FF Qualifications. A. Vela CD, 11807 Crystal, Chino, Calif. 91710. Sponsor: **Califas Club.**

May 18 — Sacramento, Calif. (AA) No. Calif. FF Council 2nd Meet. Site: Jackson Rd. & Sunrise Ave. J. Bilgri CD, 1255 Blackfield Dr., Santa Clara, Calif. 95051. Sponsor: **Oakland Cloud Dusters.**

May 18 — Taft, Calif. (AA) SCAMPS 3rd Texaco Annual. Site: Gardner Field. S. Taibi CD, 4339 Conquisto Ave., Lakewood, Calif. 90713. Sponsor: **SCAMPS.**

May 18 — Tucson, Ariz. (AA) CCMAC Spring Invitational CL Meet. Site: Rodeo Park. T. Snow CD, 909 E. Ellis, Tucson, Ariz. 85719. Sponsor: **Cholla Choppers.**

May 24-25 — Sumter, S. C. 1969 Iris Festival RC Invitational. Flying by invitation only. Site: County Airport. J. Bradham CD, P. O. Box 163, Sumter, S. C. 29150.

May 24-25 — Lafayette, La. Model Aviation Day for CL & RC. Site: Comeaux School. C. Castaing CD, Box 52385 OCS, Lafayette, La. 70501. Sponsor: **Acadian RC Club.**

May 24-25 — Hampton, Va. (AA) 5th Annual Southeastern Va. RC Contest. Site: Langley AFB. D. Holmes CD, P. O. Box 814, Grafton, Va. 23490. Sponsor: **Southeastern Va. RC Group.**

May 24-25 — Atlanta, Ga. (AA) Greater Atlanta RC Meet. Site: Club Flying Site. R. Roberts Jr. CD, 2443 Woodside Way, Chamblee, Ga. 30041. Sponsor: **Atlanta RC Club.**

May 24-25 — Chicago, Ill. (AA) 7th Annual Season Opener RC Contest. Site: Kickapoo Woods. C. Ziemba CD, 5540 S. Pulaski Rd., Chicago, Ill. 60629. Sponsor: **RC Club of Chicago.**

May 24-25 — Yukon, Okla. (AA) TORKS 9th American RC Annual Meet. Site: Cimmaron Airport. C. Brownlee CD, 3033 Rolling Stone, Oklahoma City, Okla. 73120.

May 25 — Baltimore, Md. (AA) Flite Streaks 3rd Annual Combat Contest. Site: Skyview Park. L. Lauer CD, 831 Lannerton Rd., Baltimore, Md. 21220. Sponsor: **Flite Streaks.**

May 25 — Brooklyn, N. Y. (AA) Academy of Aeronautics Annual CL Meet. Site: School Athletic Field Adjacent to Laguardia Airport. J. Yellen CD, 117 Gordon Blvd., Floral Park, N. Y. 11001.

May 25 — Endicott, N. Y. (AA) 4th Annual Northeast Pylon Championships. Site: Tri-Cities Airport. R. Noll CD, 96 Pine Knoll Rd., Endicott, N. Y. 13760. Sponsor: **Aeroguidance Society, Inc.**

May 25 — New Castle, Pa. Open RC Fun Fly. Site: PORKS Field. Z. Allerton CD, 124 Richelieu Ave., New Castle, Pa. 16101. Sponsor: **P.O.R.K.S.**

May 25 — Tullahoma, Tenn. (AA) 5th Airfoiler Old Timer FF Meet. Site: Airfoiler Flying Field. C. Tuthill CD, 101 Westwood Dr., Tullahoma, Tenn. 37388. Sponsor: **Coffee Airfoilers.**

May 25 — Denver, Colo. (A) MMM Monthly Outdoor FF Meet. Site: Prop Busters Field. R. Combs CD, Rt. #1 Box 712, Morrison, Colo. 80465. Sponsor: **Magnificent Mountain Men.**

May 25 — Johnsville, Pa. (AA) FF Fling. Site: NAS. C. Danila CD, 12111 Covert Rd., Philadelphia, Pa. 19154. Sponsor: **Levittown Flying Bucks.**

May 30 — Van Nuys, Calif. (A) Circle Burners 500 Lap Races for CL. Site: Sepulveda Basin. T. Lowry CD, 23448 Vanowen St., Canoga Park, Calif. 91304.

May 31-June 1 — Clarksdale, Miss. (AAA) Clarksdale Climbers 9th Annual FF & RC Meet. Site: Fletcher Field. Mrs. G. Pickel CD, 1631 Steen Dr., Clarksdale, Miss. 38614.

May 30-June 1 — Marysville, Ohio (AA) Central Ohio FF Rally. Site: Lee Farm & Airstrip. L. Willis CD, 1006 E. 12th Ave., Columbus, Ohio 43211. Sponsor: **Central Ohio FF Club.**

May 31-June 1 — Troy, N. Y. (AAA) Northeastern N. Y. State Invitational for CL & RC. Site: Industrial Park. A. Hurd CD, 22 Racklin Lane, Loudonville, N. Y. 12211. Sponsor: **Flying Knights MAC.**

May 31-June 1 — Grand Junction, Colo. (AA) 5th Annual Memorial Day FF Meet. Site: 21 Rd. P. Neilsen CD, 2104 Gunnison Ave., Grand Junction, Colo. 81501. Sponsor: **Grand Junction Modeleers.**

June 1 — Chardon, Ohio (AA) CRC 500 All Pylon Races. Site: Club Field. F. Vidmar CD, 26500 Zeman Ave., Euclid, Ohio 44132.

June 7-8 — South Bend, Ind. (AA) TVRC RC Meet. Site: Club Field. J. Hoffer CD, 1312 Brummitt Lane, South Bend, Ind. 46615. Sponsor: **Tri Valley RC Club.**

June 7-8 — Spencerport, N. Y. (AA) 10th Annual N. Y. State Championships for RC. Site: Salmon Creek Park. T. Salvemini CD, 6 Valley Lane, Avon, N. Y. 14414.

June 7-8 — Nashville, Tenn. (AAA) Mid-South RC Championships. Site: Edwin Warner Park. R. Reuther CD, 216 Vaughns Gap Rd., Nashville, Tenn. 37205. Sponsor: **Middle Tenn. RC Society.**

June 7-8 — Lincoln, Nebr. (AA) Lincoln Sky Knights 10th Annual RC Contest. Site: 33rd & Superior. R. Keenan CD, 7131 Colby, Lincoln, Nebr. 68505.

June 7-8 — Columbia, Md. (AA) 2nd Annual DC RC Glider Meet. Site: DCRC Field. W. Nesbitt Jr. CD, 1115 Chickasaw Dr., Silver Spring, Md. 20903. Sponsor: **DC/RC.**

June 7-8 — Shreveport, La. (AAA) Louisiana State Model Airplane Championships for CL. Site: Hobby Park. W. Lank CD, 9903 Witham, Dallas, Tex. 75220.

June 8 — Queens, N. Y. (AA) Luftmeister Custom Tailored Navy Carrier Profile Meet. Site: Flushing Meadow Park (Pending). J. Condon II CD, c/o 131-30 223 St., Laurelton, N. Y. 11413.

June 8 — Great Southwest, Tex. FAI FF Qualifications. Site: Country Rd. & Chapel Rd. W. Mc-

Continued on page 70

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NEW SEMI-SCALE R/C KITS FROM AIRTROL!

Fly well with any kind of radio gear from single channel to full proportional equipment. Kits feature vacuum-formed high-impact fuselages . . . molded foam wings and stabilizers. Pre-cut parts. Need no finishing. Cement included in all kits. Less than 3 hours assembly time per kit. Immediate delivery.

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A beautiful model of one of the first successful, highly maneuverable combat/scout planes of World War I. 44" wing span. For .10 to .15 engines. Weight: 32 ozs. (less engine and equipment)

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Mustang

Continued from page 27

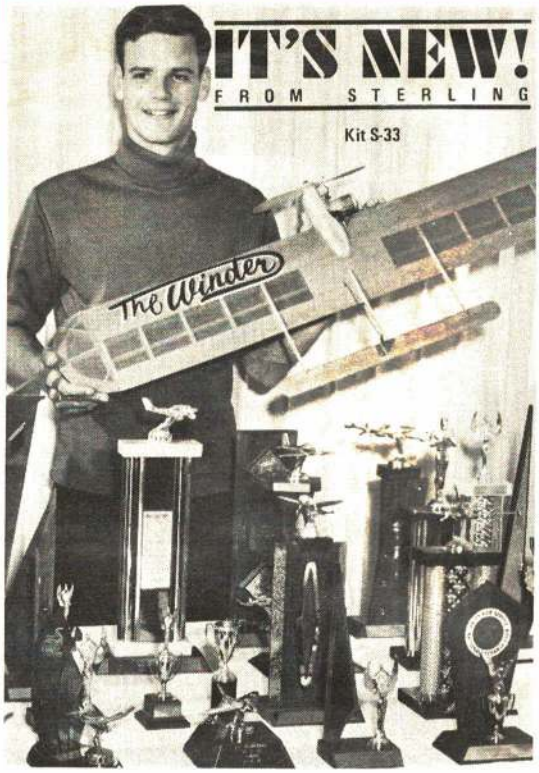
pushrod connection is fully fail-safe. First, the pushrod is retained by a 3/32" Du-Bro wheel collar. Second, centrifugal force holds the pushrod into the flap connection. Finally, I mounted a piece of plywood inside the fuselage which prevents the elevator pushrod from being disconnected until the wing trailing edge is lowered ¾". The wheel collar is really unnecessary but keeps the elevator pushrod from rattling against the plywood retainer. Like any other pushrod rattle, it is noticeable in flight when the collar is omitted.

Result of this extra effort is an airplane that ships easily, which is important to a fellow with airline passes for contest travel. The shipping box is 5 x 2 x 1', weighs 35 lbs. loaded and will go into any airliner.

Last unusual feature is the landing gear length which is scale. For years stunt ships have been hugging the ground on their stubby landing gear. Usually, the reason given is that with a short landing gear, models will take advantage of the ground cushion for improved landings. Aerodynamically speaking, the ground cushion is there and very noticeable up to a height equal to one-half of the wing span. One inch of landing gear length, more or less, when you are already in the ground cushion, has negligible effect on the landing characteristics of any stunt ship. What is actually gained is an improvement in takeoff and landing characteristics due to other important factors.

Let's discuss the takeoff. Any conventional landing gear type aircraft yaws left (inward) or takeoff for two reasons, and those occur consecutively. First, when the aircraft is rolling in a nose-high attitude, the descending propeller blade is operating at a higher angle of attack than the ascending blade, and is therefore producing more thrust and the left turning tendency. This is called P-effect.

The other action is gyroscopic precession. As the tail lifts, a forward force is applied to the top of the propeller arc and a rearward force to the bottom. Since the reaction of a gyroscope (spinning propeller) to these forces occurs 90 degrees later in



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Complete prefabrication of diecut and shaped parts assures fast and accurate assembly. Some distinctive design highlights are: triple tail booms; the high apsect ratio wing; a specially developed semi-diamond thin airfoil; and a structural design that resists wing flexing.

For .35 engines
Wing Span: 42½"

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Profile R/C . . . and it's almost ready-to-fly!

Pride of the Luftwaffe in World War II, The Messerschmitt ME 109 was Hitler's symbol of air supremacy, ruling the skies over Europe during the early years of the war. Now Sterling recreates the ME 109 in profile R/C that's almost ready to fly and it's ready to be flown in R/C combat against Sterling's first exciting profile R/C model, the P-51 Mustang. Get the ME 109 on Friday, fly it on Sunday.

The ME 109 kit features brilliant high gloss red plastic covered wing panels, ready to join; completely assembled ready-to-go factory-built fuselage in which the maple motor mounts, maple nut blocks, birch plywood sides, birch wing saddle, etc., have been factory installed. Complete with two sheets of giant authentic decals; plastic canopy, wing tips and hatch; formed wire landing gear, a Sullivan see-through fuel tank and all required hardware, nylon horns, nylon push rods; etc.

Kit FS-24 **$34.95**

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Excellent performance!

Britain's most devastating World War I fighting plane. This reknown fighting machine was the scourge of the Boche air force because of its remarkable speed, extreme strength and sheer flying ability. Some of the leading aces of World War I registered their greatest victories in the S.E. 5a. Now Sterling flawlessly reproduces this legendary fighter with a superb 1½" scale super detail model . . . and its size is perfect for the new proportional radio gear!

Kit is complete with finest quality balsa, plywood, maple, etc., beautifully diecut and accurately shaped. Formed wire landing gear & wire center struts; detailed scale plastic machine guns, lower hinged cowl, and other plastic parts; giant authentic decals, metal radiator-shutters, nylon tube pushrods. Hardware pack includes all the screws & nuts, nylon control horns, nylon bell cranks, etc. Complete plans, full-size layouts and step-by-step instructions.

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the direction of rotation, the result is a forward push on the right side of the prop arc, and a rearward pull on the left side as viewed from behind. This causes a left yaw. A left yaw will result from any nose-down pitching maneuver and a right yaw will result from an upward pitch.

Obviously, the takeoff of the tricycle gear ship is not affected by these forces, and the conventional gear type will quit trying to come at you as soon as it is up on its main gear. Shortening the main gear or lengthening the tail-wheel strut will cause the airplane to sit flatter and reduce P-effect. The smaller pitch to a level attitude reduces gyroscopic precession. Don't carry this to an extreme though, or you may run afoul of AMA stunt rule 21.6.

Full-size aircraft must assume a nose-high attitude to develop the lift necessary to fly at low speeds. An excessively long tail-wheel strut would keep a full-size aircraft from reaching this nose-up attitude without the stunt ship's full-span flaps to first lift it clear of the ground. Fortunately, the Mustang is big and heavy enough, and has a proper main gear location so that it is able to get itself smoothly and reliably up on its gear without complete loss of line tension or accidentally becoming airborne.

Conventional gear placement consists simply of striking a balance between the nose-down pitch from wheel drag and the nose-up pitch resulting from the weight of the model settling behind the main gear on touchdown. For most ships this balance is achieved by placing (with fuselage horizontal) the main gear axle on a line drawn 15-20 degrees from a vertical through the CG. Start this line also at the CG and extend it downward. If you fly mostly from grass you should favor the forward location (20 degrees) because of increased wheel drag.

The Mustang, however, operates beautifully from grass with a 17-degree gear location, due mostly to its larger diameter wheels. Moving the main gear further forward will result in a bounce on nearly every landing unless you also lengthen the tail-wheel strut or shorten the main gear, so that the tail-wheel touches down sooner or at the same instant as the main gear. The tall tail-wheel will prevent any nose up rotation at touch-down, virtually eliminating bounce from hard landings. This gear configuration gives maximum takeoff and landing consistency with a minimum of effort and is, unfortunately, usually scored high by inexperienced stunt judges. I avoid the tall tail-wheel for two reasons. First, it doesn't look like anything that you might find on a real airplane. It would limit approach pitch attitude and would force any airplane to land at a relatively high speed. Second, when you eliminate the chance of a bad landing you also eliminate the fun and challenge of landing a good ship well.

The movable rudder is the airplane's most valuable asset. This eliminates most of the yawing in the maneuvers which is the major cause of loss of line tension. Stunt ships with properly rigged movable rudders will fly as tightly on lines during outside maneuvers as inside maneuvers Extra line tension on the reverse wing-overs, vertical-eight and hourglass must be felt to be believed. The Mustang also has the happy characteristic of sufficient penetration and line tension to fly the first loop of the four-leaf clover properly placed, rather than biased left as most are flown.

Start with about ½" rudder offset (no rudder offset if you used engine offset) and the center hole on the Top Flite nylon horn. The rudder should have equal travel inboard and outboard of this point. Now, fly the airplane, as the square-eight is the best place to check the maximum right-rudder

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The Versatile *Almost-Ready-To-Fly* Fun Model

For Single or Multi-Channel Radio Control; Also Free-Flight

Span 42"
Length 31"
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Can be flown 6 ways:

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Full explanation of each method given on plan.

FEATURES:

- One-piece molded Wing, high-lift
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- Molded Fuselage, completely assembled with firewall, nose gear, plywood floor, side rails, and main landing gear block already installed
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Radio Control Flying is Fun! You can actually feel the thrill of controlling an airplane in flight — doing stunts, loops and rolls — and making it come back to you and land where you want. And the shortest way to success is with the unique new RANGER 42. This model has been carefully engineered, leaving only the simplest final assembly steps, all clearly illustrated. Flight stability is exceptional, as well as response to control. **All you have to do is add your engine, wheels, and radio control — only 6 to 8 hours work — and you're ready to go FLYING!** Just ask your hobby dealer — he'll be glad to show you the features.

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Semi-Scale Beauty in A Great Flying Model!

DELUXE — Includes New Fittings

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Tough, roomy cabin and front end, takes single to 10 channels or proportional. Steerable nose gear.

SPAN 62" AREA 540 sq. in.
LENGTH 50" WEIGHT 4½ - 5 lbs.
FOR ENGINES FROM .19 to .35

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For Single Channel — Escapement, Servo or Pulse
Span 42" Area 244 sq. in.
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Span 69" Area 810 Sq. In.
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Span 56" Area 558 sq. in.
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DELUXE — Includes New Fittings. For Single Channel — Escapement, Servo or Pulse
Span 37" Area 250 sq. in.
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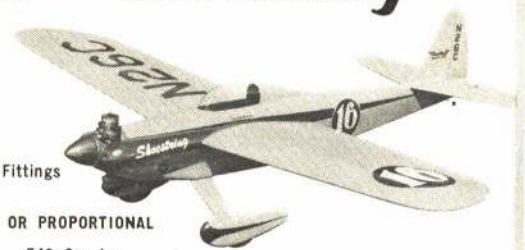

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position. As the ship climbs straight up and pitches down to do the outside half of the square-eight, you will probably lose tension. Start adjusting for more right rudder on full down until the ship grooves through that corner with no bucking felt in the handle. Now try the various holes of sensitivity adjustment, each time readjusting the length of the Kwik-Link to place the rudder in the previously determined maximum right position. When you have found the combination that you like best, stand that hourglass up the way it is shown in the rule book.

To build the Mustang there are two basic attitudes which must be maintained if you expect to be competitive when you finish. First, alignment must be perfect. The wing is framed, sheeted, flapped and cured in a rigid jig. The only additions to the wing when it comes out of the jig are the wheel doors and wing tips. The stabilizer root is left square and glued to the fuselage top before the root is shaped. Wing alignment is easy as the wing centerline is the bottom of the 3"-sheet fuselage sides.

You must build lighter than you ever have before. Weight must be a constant challenge. The Mustang, while not larger than other stunt ships, is much more massive. Contest balsa throughout, including blocks, is mandatory. My F-51 came out at 48 ozs. without nose weight, and it required 4 ozs. of lead in the nose to move the CG less than one inch. The use of the heavier S.T. 40, and the ½" additional nose length shown in the plans, should balance the Mustang without extra nose weight.

Although my Mustang flies great at 52 ozs., no competition stunt ship should be burdened with almost 10% dead-weight. If you are careful your Mustang should weigh 46-48 ozs. You can save an additional 1½-2 ozs. of all-up weight by making the wing fixed. This should be considered if you don't need the transportation capability. The removable wing must be disassembled after each flying session to clean oil off of the top of the wing inside of the fuselage.

Construction is, with few exceptions, completely conventional. The fuselage is built like most stunt ships with 3"-sheet sides and hollowed blocks on the top and bottom. To build the fuselage, first cut the ¼" Sig Contest balsa sides and the 21"-long $\frac{1}{32}$"-plywood doublers and laminate them with epoxy glue. While this is drying, build the engine-tank unit, consisting of the ½" sq. engine bearers, $\frac{3}{32}$" cowl ring, ⅛"-plywood firewall, ⅛"-plywood wing-mounting bulkhead, and the Veco T-21E tank. (Modify the tank by replacing the brass vents with annealed copper vents.)

Tape the fuselage sides from ¼" at the wing trailing edge location to $\frac{3}{32}$" at the tail post with a razor plane, and join the sides to engine-tank unit. Add the stabilizer bulkhead and the cross-fuselage spacers of ⅛ x ¼" balsa. Next, tack glue the blocks on the fuselage and shape them, then remove the blocks and hollow until a strong light begins to show through. Glue the $\frac{3}{32}$"-plywood tail-wheel mount to the inside of the hollowed ½" sheet aft fuselage bottom.

The jig I used to build the wing was simple, cheap and completely satisfactory. It cost about $5.50 and is reusable. Stock for the jig is of compressed wood chips, ⅝" thick. It consists of a 6 x 2' base and four 4 x 6" tube supports. I also used two ⅜" x 6' aluminum tubes held to the four supports with rubber bands.

Cut the root- and tip-rib templates from .032 aluminum. Sandwich 14 pieces of $\frac{1}{16}$" Contest quarter-grain balsa between the templates, and carve and sand one set of ribs to shape. Now duplicate this process

to obtain another set of ribs for the other wing. I do not sand the bevel off of the edges of the ribs. I would rather risk a poor glue joint than ruin the contour of the wing. In sheeted construction, the area aft of the spar is considerably over-stressed anyway.

Make the jig alignment template from .020 celluloid by tracing from the plans, or by constructing the scratched lines anew on the plastic. The horizontal lines are 1/16" apart and the vertical lines are 3/32" apart. Locate the 3/8" holes carefully, both horizontally and vertically, then punch out with a piece of sharpened 3/8" brass tubing and a hammer.

Next, align rib no. 1 on the bottom horizontal line of the template, with the horizontal line running through the center of the leading-edge cutout and the center of the trailing edge. The trailing edge should be aligned with the leftmost vertical line. Now use that sharpened 3/8" brass tube to twist through the holes of the plastic template to cut holes in the balsa rib. (Sharp-edged tubes make very neat holes.)

Rib no. 2 uses the second horizontal line from the bottom and the second vertical line from the left, etc. Notice that the jig holes penetrate the center-section ribs at the top and the tip ribs at the bottom. This method will give 7/8" dihedral in each wing panel with a simple flat jig. Punching the ribs individually not only is necessary for the dihedral, but results in much greater accuracy of rib alignment than stacking and drilling the ribs. This is also true for straight wings with no dihedral or trailing edge sweep.

Work these ribs onto your 3/8" aluminum jig tubes slowly, with much tube twisting, because the ribs fit tightly, and will split if you are not careful. Once all of the ribs are on the tubes, space them as shown on the plans, with the outboard wing using approximately 1/16" closer rib spacing than the inboard wing. The total span, minus tips, should be 55". Now you can add the spars, spar doubler, leading and trailing edges.

After the 1/4"-sq. leading edge is in place, make a root-rib extension, using a copy of the forward part of rib no. 1, and install as shown with a short piece of 1/4" sq. to serve as the wing-cuff leading edge. Now add scrap to ribs no. 2 and 3 and shape by sighting from the rib no. 1 extension to rib no. 4 and trimming the scrap. Trim the 1/4"-sq. leading edges flush with the inside of rib no. 1 and glue a soft balsa block between rib no. 1's at the leading edge. This is the wing dowel mounting block and now should be carved to shape.

The 1/8" landing gear wire struts should be bent to shape and "J"-bolted to the 1/8" plywood mounts. These gear assemblies are glued to the bottom of the leading edge 1/4" sq. and to the top of the 1/8 x 1/4" spar doubler between ribs no. 3 and 4. A 1/16"-plywood spar web is suggested for this bay only. Install the double bellcrank mount, bellcrank, leadouts, flap pushrods and flaps, and operate the flaps while still in the jig to insure complete freedom of movement and adequate travel.

Sheet the wing leading edge using plenty of pins, aliphatic resin glue, and a little water on the outside of the sheeting in the area of the cuff. The cuff leading edge is covered separately with a small triangular section of sheet. The sheeting will go down smoothly and tightly with no splits if you are careful. Next, install a hardwood block in the trailing-edge center-section and, after temporarily mounting the fuselage on the wing, add the wing-mounting structure to the fuselage, and drill the trailing edge for the wing-mounting nylon screws.

Cut and shape the stabilizer and elevators

from 4-5 lb. contest 3/8" sheet. The bushed, hinged assembly, ready to install, weighed 1 5/8 oz. My 3/32" music-wire elevator pushrod was stiffened by a 1/8" brass tube soldered over it (no fairleads) and weighed 3/4 oz. The same pushrod made from 1/4" fiberglass arrow shaft with 3/32" music wire ends, weighs 3/8 oz., a savings of 3/8 oz. in the tail with no loss of stiffness. Don't try to substitute brass tubing for the fiberglass shaft. Brass fatigues and cracks.

The vertical fin and rudder are built as shown with a symmetrical airfoil. These units hinged, ready to install on the fuselage, should weigh less than 3/8 oz.

With the fuselage temporarily mounted on the jigged wing, bend the elevator pushrod, solder it in the elevator horn, and glue the stabilizer to the fuselage. Install the elevator pushrod connection on the flap pushrods, align the controls, and solder. Glue on the vertical fin and hook up the rudder. At this point the control system should be finished and operating smoothly. Glue on the fuselage blocks. Carve and install the cowling and the air scoop. Finish sheeting the wing and cover the wing center-section joint and fuselage-bearing area with fiberglass and epoxy glue.

Be careful when you remove the center jig tube supports to finish sheeting the wing. I supported the center-section of my wing at this point by the leading-edge dowels and the trailing-edge mounting holes, and assured proper alignment by bore sighting the jig tubes and shimming the new center-section supports as required. Mate the fuselage and the wing, carve the fillets and fiberglass the nose.

My Mustang was finished with two coats of Randolph non-tautening butyrate dope to seal the wood. I then covered the entire airplane, except the fiberglass areas, with Jap tissue and two more coats of the Randolph dope. I switched to Aero-Gloss to fill and color the surface and completed the job with two more coats of the Randolph non-tautening dope. The use of non-tautening dope, wherever possible, and adequate drying time between coats, will insure a perfect, pull-free finish.

I hope that you derive as much pleasure and satisfaction from your Mustang as I have from mine.

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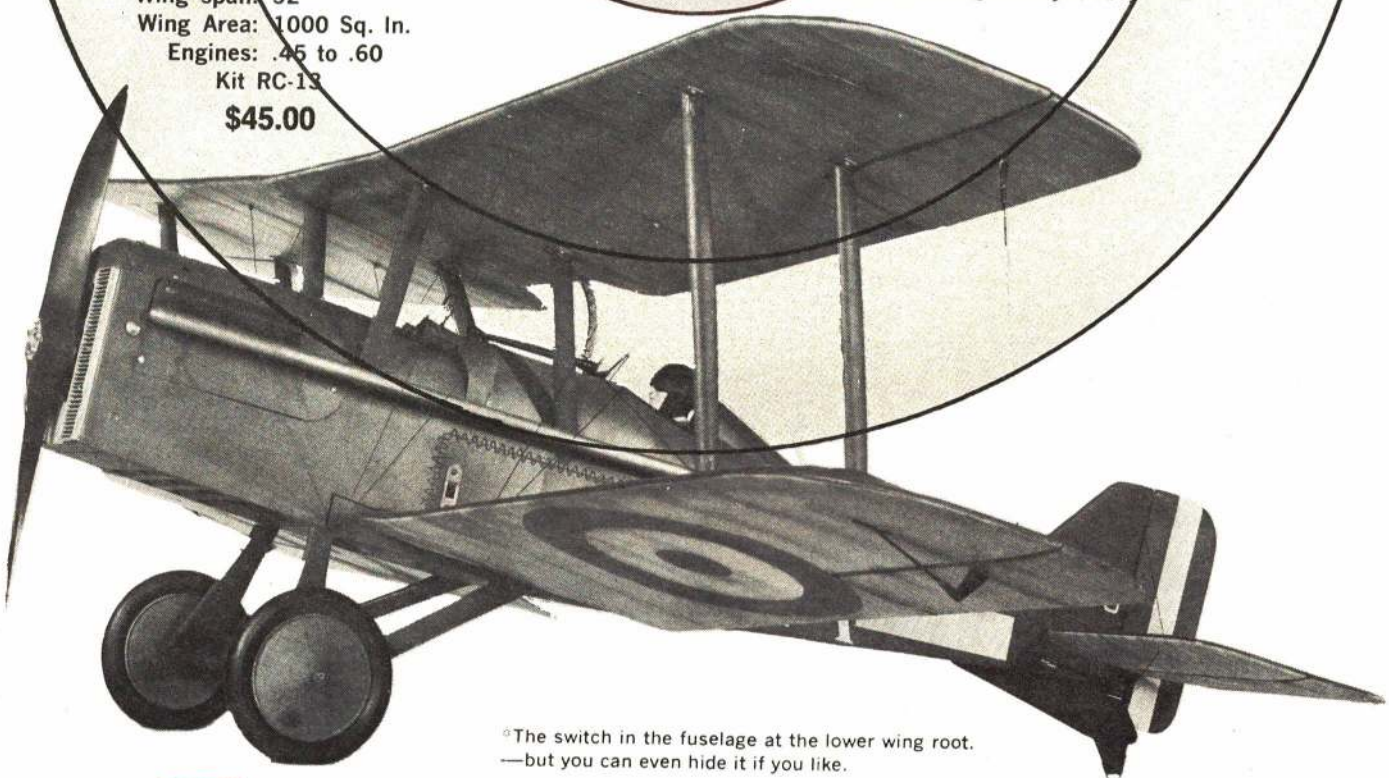

*The switch in the fuselage at the lower wing root. —but you can even hide it if you like.

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Radio Control World

Continued from page 31

a screw holder on one end, a magnet on the other. Magnet end is beautifully knurled, and is easy to cut to desired length. Magnet is easily removable, tool costs 98c. Drill out end and tap to use on open-face stick assemblies, or drill deeper and larger hole to slip over closed-style sticks.

Same source, if Nyrod inner tubing doesn't slide easily in its nylon casing, rub the inner part with dry soap (Ivory works best); also, check for areas of outer tube that aren't round. To straighten Nyrods, Ed prefers to slip the assembly (inner and outer tube together) into a close-fitting piece of brass or aluminum tubing. Then heat metal tube *gently* with a torch and let cool. Nyrod will come out perfectly straight. On the other hand, Dave Burt prefers to slip a straight length of close-fitting music wire *inside* the Nyrod casing. He "irons" it with a household iron set medium-high until the music wire is hot, then lets whole thing cool. Again, you'll attain a straight Nyrod. Su-Pr-Line Products sells this material in straight 30" lengths, but to get the 36- and 48-in. lengths, you must buy it coiled.

Graupner Wankel engine: Pictured is the latest Wankel model engine from Graupner. Apparently it is the production version as their new catalog lists the 30 cu. in. unit with its performance data.

The German firm has had the Wankel under development since 1961. In the later stages their efforts were turned over to O.S. of Japan. And the engine is now officially known as the "Graupner O.S.-Flugmotor."

Maximum diameter of the single-rotor engine is 3¼ in. and the length, from its rear to the prop drive washer, is 2½ in. Carburetor is a modified O.S. .30 R/C type. Weight is about 11 oz. Power curves, with a fairly low-nitro fuel, show a high of .62 hp at 16,000 rpm and maximum torque of about 11,000 rpm. From earlier observations, output of this engine is equal to that from conventional types in the 35 size and perhaps even some 40's. Big advantage is the exceptionally smooth running. It may be obtained with or without muffler; a detachable ring allows radial mounting.

Grassroots

Hard-luck kid: From Northern Conn. RCC Newsletter (Westfield, Mass.), a very sad story. Ricky O'Brien had completed a Heathkit digital rig, went out to test it. Plane was fueled-up, engine running and he was about ready to try first flight when the engine back-fired. Normally not serious, but this time the tank had leaked badly and fuel had run back into fuselage. The

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plane went up in flames! This happened in cold weather when plastic gets brittle — but could happen any time. A tough blow to anyone, but especially to a youngster like Rick who had worked hard for the money to buy the Heathkit. Another thing to watch when it's cold — engines start best with heavy priming and a very hot glow plug, but this is a combo that can cause a fire, though generally confined to the nose area where the excess prime has dripped. (Editor — Throw a rag over nose to smother such a fire.)

Good plane designs never die: Many correspondents of Fran Ptaszkiewicz (23 Marlee Dr., Tonawanda, N. Y. 14150) have asked if they can obtain plans for the deBolt Live Wire Cruiser. He can supply copies of the original plans (no longer available from Dmeco) at $2.75 per set.

This was one of the first kit planes to feature rudder and elevator control, was marketed first in 1954. It had 65½ in. span, 775 sq. in. area, was intended (in those days!) for 19-23 power. This high-wing cabin design still makes a good trainer. Fran also has some of the original factory kit plans for the deBolt Sonic Cruiser. This more recent design was a high-winger with symmetrical airfoil, flyable with rudder-only or multi. Had 66-in. span, 860-sq.-in. area, trike LG and was intended for 19-45 engines. Plans go for $3 a set.

Checkerboard pattern: System used by H. J. Bolzenius (Route #1, Lefroy, Ont., Canada) puts a neat checkerboard pattern on landing gear covers of a scale plane. Cut a piece of MonoKote (the sticky kind) ¼ in. larger all around than needed. Mark the entire piece into checkerboard squares of desired size with a *sharp* modeling knife. Be sure to cut through the MonoKote film but *not* through the paper backing. Lift out and discard alternate squares to form the pattern, still on the backing sheet. Cover the complete design with masking tape, then lift the entire pattern from backing paper and apply to plane surface. Carefully remove the masking tape, cover design with backing paper, and press down with a warm iron. For complete protection, brush or spray on a coat of Hobbypoxy clear. The wheelcover checkerboard had ¼ in. squares of red, was applied to a white background.

Fine new field: After much searching, the East Bay Radio Controlers (Calif.) have a beautiful runway laid out in the midst of 180 acres of wide open field! Runway and pit area took 24,000 sq. ft. of asphalt. Runway is 250 ft. long, 80 ft. wide at the approach end, and 150 ft. wide at far end. It is located in San Ramon, about 28 miles from Oakland. The club also is setting up a spot in Oakland for their glider pilots, whose ranks are increasing rapidly.

Tenderfoot Funtique Contest Closes May 15

Competition

Tri-Counties Model Air Races: Braving torrential rains in the area — they flew during the calmer moments — the Santa Barbara R/C Modelers (Calif.) ran off 12 rounds of Open Pylon racing on January 19. Because out-of-town contestants were eager to go, 16 flyers braved the elements. Meet was sponsored by the Carpinteria Jaycees. Tom Protheroe was CD. Half the entrants were members of the San Gabriel Valley R/C League, and the top three winners (Jim Jensen, Glendora; Mike Bridges, El Monte; Ray Tellas, Cudahy) were from this organization.

Wright Brothers Memorial R/C Champs: The seventh running of this big meet will again be sponsored by the Western Ohio Radio Kontrol Society, on June 21-22. Again to be held at huge Wright Field, east of Dayton, Ohio, where large runways and fine Air Force cooperation assure the best facilities possible. There will be five AMA Pattern events: Class A Jr.-Sr.; Class A Open; Class B Jr.-Sr.-Open; Class C Novice and Class C Expert. There also will be events for Scale, Formula I pylon, Open Pylon, Limbo, and a trial of Don Lowe's proposed "Prototype Pattern." AMA-sanctioned, of course. Further info may be had from Capt. Ron Van Putte (182 Orinoco St., Dayton, Ohio 45431).

Academy For Aerospace

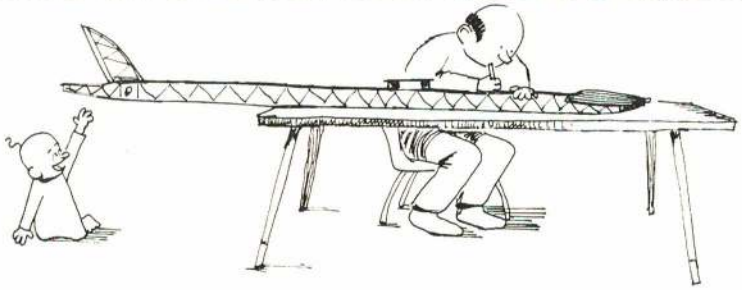
Continued from page 18

In addition to this event, a special display boat show and demonstration is planned on American Lake June 29, sponsored by the Seattle Model Yacht Club, with model airplane and rocketry activity as well.

This summer, Central Washington State College and the Washington National Guard will co-sponsor an aerospace workshop for elementary and secondary teachers. This will be a five-week resident credit course for the 80 teachers expected. Construction of a model airplane or rocket will be a requirement for completion of the course. Another group from the University of Washington will hold a similar session with modelers and manufacturers' representatives as instructors.

A summer camping program is again planned this year for 2,000 youngsters, but this year, one of the camp crafts will be model building.

The campaign for educational acceptance in Washington recently passed a milestone. The Superintendent of Public Instruction called a special meeting of his Aerospace Education Advisory Committee to examine and study the Guard's proposal in depth. The members of the committee endorsed the proposal for establishing a center for aerospace education and modeling activities at Camp Murray. As James M. Garner, Su-



pervisor of Science Programs, stated in his letter: "We feel that such a center could contribute significantly to the enrichment of existing school programs, and could become a pilot project which other states might choose to emulate." A planning board has now been appointed by Governor Evans to define the objectives, identify feasible means of obtaining financial support and to provide the guidance so necessary in determining the eventual success of the program.

So, that's the story of the Washington Academy for Aerospace Science and Modeling to this date. We wish we had the completed story to give you in this issue, but perhaps it's just as well we don't. To be completely successful on behalf of modeling, we in the Guard want to make sure that every move we make is a positive step forward for modeling, utilizing every possible suggestion and capitalizing on the expertise available. General McGee recently summed up our responsibility in these words: "This is not just a project of the Washington National Guard. This program will demonstrate the need for an interrelationship of all community resources — governmental, industrial, educational and private support. With its success will come your success as modelers and a giant step toward full recognition of the marvelous science called modeling."

Sky Squire Compacts

Continued from page 25

nose gear, adding a steerable nose gear of your choice if you prefer. It would be best to eliminate the steerable nose wheel on the ½-A size model because of the extra weight involved in a model this small. Install tubing for throttle pushrod, and box off the battery pack area under the fuel tank compartment.

After installation of the nose gear, cut and glue the lower nose block in place, installing blind mounting nuts in the motor bearers before you do so. Add the remaining bottom sheeting. Cut and glue the balsa blocks in place that form the sides of the tank compartment and the rest of the nose. Then cut and glue the blocks in place that form the windshield and the cabin fairing aft of the wing. Add the wing saddle pieces to the wing opening, along with the plywood gussets to reinforce dowel mountings. Carve and sand the nose and windshield blocks to final shape, then sand the entire fuselage to finished shape, rounding all corners as you do so.

Fin and rudder are simple, but be sure to use hard sheet for the top portion of the fin to give added protection for nose-overs. Glue the fin and dorsal assembly in position on the top of the fuselage, lining it up very carefully to make sure it is on dead center. Fuel proofing the engine and tank area with a couple of coats of fiberglass resin completes the fuselage.

Covering and finishing: You can keep the final weight down by covering with colored silk, as I did on the prototypes, using colored dope only for the trim. After fine sanding the entire ship with 400 paper, apply a coat of clear dope with talcum powder added. Sand, then follow with a coat of untreated clear dope. Sand lightly, and apply silk to entire ship. After silking, give the entire ship six to eight coats of thinned-out clear dope. Mask off trim and window areas, and apply colored dope to these areas. After this has dried and masking tape has been removed, add wing and stab hold-down dowels, and paint with colored dope to match the rest of the ship. Then spray two thinned-out coats of clear Aero-Gloss on the entire ship. This helps level out the sheen of the dope, giving it a uni-

form gloss, levels the edges caused by the masking tape, and adds additional fuelproof qualities to the final finish. Now, all that is left is to install engine, landing gear, wheels, tank, and radio gear.

Test flying: Check for proper position of the CG, and to see that all surfaces are true, with no warps, and properly aligned. If any warps, steam out before flying. Check to see that decalage is as specified on the plans. If all checks out O.K., only a few test hops will be needed for final trim. Try to achieve smooth, flat glide approaches at idle power with elevator at zero trim. Ship should climb well under full power without hanging on the prop. If it tends to hang, increase the down thrust. If ship tends to go to left or right under power and in glide, trim rudder. If it does this only under power, but glides straight, adjust side-thrust as necessary. This is about all the trimming you'll need to do before you're ready to settle down to some real fun-flying with your compact Sky Squire, in whichever size you have selected.

Find The Area

Continued from page 38a

either enlarge a 1/72 drawing by 9 or a 1/48 drawing by 6, as the table shows.

Case 2: Bill wants a F.W. 190 for his 45 engine to fly C/L. A ball-park area here would be around 300 sq. ins. From the area of the full-size airplane (197 sq. ft.), Bill sees that a good scale will be 1¼" = 1', giving a wing area of 197 x 1.56 = 307 sq. ins. Span here gets to be 34.5 (span in feet of real F.W.) x 1.25 = 43⅛". For an even enlargement of a scale drawing, the table tells Bill that he'll need a 1/48 scale drawing to multiply by 5.

So, we see that given this table, a whole lot of measuring and drawing of unsuitable size plans is saved. The scope of the table goes from 1" x 1' to 2" = 1' which is where 99 out of 100 scale models fall, and is graduated in many steps to allow very accurate area-requirements to be met almost exactly.

Finally, I wonder if I can hope that some modeler (much cleverer than me) will give us a simple table for choosing our subject!

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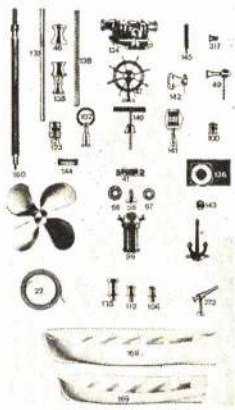

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3 Blade Tractor

5-3 5-4 6-3 6-4	50¢

3 Blade Pusher

6-3	50¢

2 Blade Tractor

5-3 5-4 5½-3	Each
5½-4 6-3 6-4	25¢
7-4 7-6 7-8	40¢
8-4 8-6 8-8	60¢

below in white, too

9-4 9-6 9-7 9-8 10-4 10-6	85¢
11-4 11-6 11-8	$1
RC 12-4 12-5 12-6	$1.50

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Toledo R/C Expo

Continued from page 35

19 to 29 power. Normal wood construction, but many plastic parts — machine guns, cowl etc. Metal radiator shutters. True scale except for airfoil; $21.95. Also new — 55" span profile Me109 for big engines, full multi; Pre-assembled fuselage, foam wings; $34.95.

Su-Pr-Line Products (34B Cooper Dr., Plainfield, Ill. 60544): Complete hardware for their Nyrods and other types of linkage — clevises, keepers, adapters, etc.

Tatone Products (4719 Mission St., San Francisco, Calif. 94112): Peace Pipe mufflers, steerable nose gear, engine mounts, countless other accessories for model builders and flyers.

Top Flite Models Inc. (2635 Wabash, Chicago, Ill. 60616): Two-inch exact scale SE5a; 53" span, for 40-60 engines; full-size plans, formed metal cowls. Special adjustable strut fittings. Fuel-proof matte decals; $45.

Trans-Stand Inc. (Box 144, Wyckoff, N. J. 07481): Light folding stand to hold transmitter (any type or size) out of dirt, prevent tipping in wind. Holds case at 45-degree angle. Has carrying handle — $6.95 pp.

Vic's Custom Models (618 Cowpath Rd., Montgomeryville, Pa. 18936): Very smart "Son-O-Jet" F.G. fuselage has "Crusader-style" nose contours. Has 60" span pre-covered foam wing and stab, canopy, trike LG components. Split rudder acts as drag brake. In ARF kit form.

VK Model Aircraft Co. (12072 Main St., Akron, N. Y. 14001): Newest kit is Cherokee Babe for pulse propo, small digital — 53" span, 470 sq. in. wing. For 19 to 35 power. Formed cowl and windshield, steerable nose gear, full-span ailerons. Flying weight is 3-4 lbs.; $25.95.

Warner Industries, Inc. (259 Hosack St., Columbus, Ohio 43207): Wide line of precision foam wing cores; also custom foam cutting. "Jig-It" is fuselage assembly jig on heavy 10 x 45" base, fully adjustable for many shapes and sizes; $15.95.

Wenzel Engineering Co. (16 Newbridge Rd., Hicksville, N. Y. 11801): Four-feet-long rocket kits from polyfoam, fully pre-fabbed for fast assembly; $9.95.

Williams Bros. (6719 Salt Lake, Bell, Calif. 90201): Extensive line of molded plastic items. Engine cylinders, wheels, pants, spinners, linkage parts. Sportsman pilot is new, in three scale sizes. Exact scale WW I machine guns. Nats-winning "La Jollita" Formula I pylon racer; $32.95 kit.

Wing Mfg. (Box 44, Morton Grove, Ill. 60053): Kits for scale WW II planes. Posi-tract landing gear. New midwing 63" span 630 sq. in. competition stunter; FG fuselage, foam wing cores, Inverted engine, very attractive; $89.95 less balsa parts.

World Engines Inc. (8960 Rossash, Cincinnati, Ohio 45236): Controlaire brick-unit plane installation package; het receiver, four-control digital decoder, three servos, in case 3¼ x 2⅜ x 2⅛" high, including all lugs, servo arms. With S-4a aileron servo and 500-maH pack, weighs 11½ oz. Brick alone is $165. Several new ARF kits, for stunt, scale, pylon.

Backyard Flyer

Continued from page 13

needed no adjustments and went right because of slight natural warps in the wing. Don't wind the model up too tightly until you feel that it is flying O.K.

You can make a winder with a piece of 1/16 dia. music wire and an old hand drill. Bend a winding hook about ½" dia. in one end, and at the other end, bend a 90-degree angle about ¼" from the end. Put the end with the bend in the drill and tighten up the chuck; the bend will lock behind the chuck jaws and prevent the wire from pulling out. With the winder you will be able to stretch the motor and put in a lot more winds. Of course a helper is needed to hold the model; this is done by using a piece of heavy wire held through a piece of metal tubing which is the rear motor mount. Lubricate the motor before each flying session. Make up several motors at a time, and break them in by stretching outside of the model. Stretch at least three times their length and hold for a couple of minutes. My motor failed at 450 winds.

If you desire longer flights, increase the length of the motor and make sure the nose block fits tightly and won't fall out during the glide. The model really moves out with six strands, and more down-thrust (shims behind the top of the nose block) will be needed to prevent looping.

This model is a trainer and can be used for flight experiments. For example, if you want a better glide, use a smaller prop.

WHAT'S YOUR FAVORITE ARTICLE THIS MONTH?

Vote here for your favorite articles. List them in order — the most-liked first, etc.

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Clip this section out or use a facsimile. Paste on a postcard or enclose it in an envelope and send to:

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733 Fifteenth St., N. W.
Washington, D. C. 20005

Contest Calendar

Continued from page 48

Cormick CD, 4612 Pleasant St., Ft. Worth, Tex. 76115. Sponsor: **Ft. Worth Planesmen.**

June 8 — Valley Park, Mo. (AAA) Greater St. Louis Modeling Assn. Annual CL & RC Contest. Site: Buder Park Model Airplane Field. B. Johnson CD, 6328 Jackson, Berkeley, Mo. 63134.

June 8 — Sacramento, Calif. (AA) No. Calif. FF Council 3rd Meet. Site: Jackson Rd. & Sunrise Ave. J. Pond CD, 2162 43rd Ave., San Francisco, Calif. 94116. Sponsor: **San Francisco Vultures.**

June 13-15 — Asheville, N. C. (AA) RC NC 15th Annual Invitational. Site: Asheville-Hendersonville Airport. B. Johnson CD, 4139 Sheridan Rd., Greensboro, N. C. 27405.

June 13-15 — Pensacola, Fla. (AAA) Fiesta Five Flags 11th Annual South Eastern Model Championships for FF, CL & RC. RC & CL Site: Corry Field. FF Site: 8A. T. McLaughlan CD, 4140 Fern Ct., Pensacola, Fla. 32503.

June 14-15 — Ft. Worth, Tex. (AA) Ft. Worth Thunderbirds RC Club Meet. Site: West Shore, Benbrook Lake. R. Lutker CD, 3105 Cockrell Ave., Ft. Worth, Tex. 76109.

June 15 — St. Charles, Mo. 1½ Hour Pre-planned RC Flying Demonstration Antique & Experimental Aircraft Fly-In. Site: Air Field. Restricted. R. Williams CD, 4060 Bondurante Dr., Bridgeton, Mo. 63042. Sponsor: **Spirits of St. Louis RC Club.**

June 15 — Forest Preserve, Ill. (AA) Skylarks 2nd Annual RC Meet. Site: Rt. 53 & Higgens Rd. H. Brokhof CD, 410 Nash Rd., Crystal Lake, Ill. 60014. Sponsor: **Skylarks.**

June 15 — Deer Lake, Pa. (AA) Tri County Wing Snappers 7th Annual RC Meet. Site: Airport. E. Stoyer II CD, 210 Washington St., Schuykill Haven, Pa. 17972. Sponsor: **Tri County Wing Snappers, Inc.**

June 15 — Haskell, Tex. (AA) Annual Sun & Fun Contest for FF. Site: Haskell Airport. C. Frierson CD, Box 188, Haskell, Tex. 79521. Sponsor: **Dallas Cloud Climbers.**

June 15 — Richmond, Va. Brainbusters FF FAI Qualifications. Site: Curles Neck Farm. F. Seddio CD, 113 Peach Tree Lane, Hampton, Va. 23369. Sponsor: **Brainbusters.**

June 21-22 — Creve Coeur, Mo. (AA) Spirits of St. Louis 3rd Annual RC Contest. Site: Spirits Field. R. Williams CD, 4060 Bondurante Dr., Bridgeton, Mo. 63042. Sponsor: **Spirits of St. Louis RC Club.**

June 21-22 — S. C. (AAA) S. C. State Championships for RC. Site: Off I-85 between Greenville & Spartanburg. L. Johnston CD, 382 Church St. #E-3. Smyrna, Ga. 30080. Sponsor: **Western Carolina RC Club.**

June 21-22 — Denver, Colo. (AA) 11th Annual Mile Hi RC Meet. Site: Lowry AFB. W. Kessler CD, 4765 E. Eliff, Denver, Colo. 80222. Sponsor: **Mile Hi RC Club.**

June 21-22 — Wallops Station, Va. (AA) Mid Atlantic Radio Kontrol Society RC Meet. H. Jones CD, 59 Aigburth Ave., Towson, Md. 21204. Sponsor: **Mid Atlantic Radio Kontrol Society.**

June 21-22 — Davenport, Iowa (AA) Davenport RC Society Contest. Site: Scott Co. Park. H. Pohlmann CD, 720 S. Ohio, Davenport, Iowa 52802.

June 21-22 — Dayton, Ohio (AAA) Wright Brothers Memorial Annual RC Meet. Site: Wright Patterson AFB. D. Lowe CD, 5936 Clar-Von Dr., Dayton, Ohio 45430. Sponsor: **Western Ohio Radio Kontrol Society.**

June 22 — Pittstown, N. J. Rockaway Valley RC Club 2nd Annual Novice Meet. Contact CD for Rules. Site: Sky Manor Airport. A. Schroeder CD, 18 Spencer Rd., Glen Ridge, N. J. 07028. Sponsor: **Rockaway Valley RC.**

June 22 — Council Bluffs, Ia. (AA) 6th Annual Midwestern Model Airplane Meet for CL. Site: Iowa School for Deaf. J. Dreier CD, 1918 Ave. B., Council Bluffs, Ia. 51501. Sponsor: **Balsa Busters.**

June 22 — Odessa, Tex. Odessa-Midland 13th Annual FF Contest. Site: Prop Buster Park, Ector Airport. L. Hood CD, P. O. Box 6622, Odessa, Tex. 79760. Sponsor: **Prop Busters of Odessa.**

June 22 — St. Marys, Pa. 3rd Annual Fly-For-Fun RC Meet. Site: Club Field, West Creek Rd. J. Florio CD, 123 Fourth St., St. Marys, Pa. 15857. Sponsor: **St. Marys Area RC Society.**

June 22 — Orchard Park, N. Y. Flying Knights 5th Annual RC Fun-Fly. Site: Airport. N. McCormack CD, 6709 Hillcroft Dr., Boston, N. Y. 14025. Sponsor: **Flying Knights of Hamburg.**

June 22 — Hastings, Minn. Minneapolis FAI FF Qualifications. Site: Webers Flying Field. D. Monson CD, 131 W. Wentworth Ave., W. St. Paul, Minn. 55118. Sponsor: **Minneapolis Model Aero Club.**

June 28-29 — Detroit, Mich. (AA) 17th Annual Great Lakes RC Meet. Site: 18 Mile & Mound. T. Brett CD, 18864 Millar Rd., Mt. Clemens, Mich. 48043. Sponsor: **RC Club of Detroit.**

June 28-29 — Hempstead, L. I., N. Y. (AA) 5th Annual RC Meet. Site: Mitchel Field. R. Geyer CD, 913 Washington St., Baldwin, N. Y. 11510. Sponsor: **Meroke Radio Club.**

June 28-29 — Tulsa, Okla. FAI FF Qualifications. Site: TGD Field, B. Hanford CD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145. Sponsor: **Tulsa Glue Dobbers.**

June 28-29 — Kansas City, Mo. (AA) KC RC Annual Contest. Site: Lake Jacomo. B. Drummond CD, 9115 Charlotte, Kansas City, Mo. 64131. Sponsor: **Kansas City RC Club.**

June 28-29 — Wichita, Kans. (AAA) Annual Midwestern Championships for FF, CL & RC. Site: Wichita Modelers Council Field, 13th & Webb Rd. J. Finley CD, 5217 E. Murdock, Wichita, Kans. 67208. Sponsor: **Wichihawks & Wichita RC.**

June 29 — Columbus, Ohio (AA) Northland CL Championships. Site: Northland Shopping Center. C. Hemmerly CD, 5607 Sandalwood Blvd., Columbus, Ohio 43229. Sponsor: **Capital City Controlliners.**

June 29 — Lowry AFB, Colo. (AA) Sky Dusters 7th Annual CL Contest. Site: South of Hangar 2. E. Haynes Jr. CD, 3065 Jackson St., Denver, Colo. 80205.

June 29 — Rockford, Ill. (AAA) Rockford Annual CL Contest. Site: Riverdhal School Playground. W. Luhman CD, 4429 Virginia Ave., Rockford, Ill. 61103. Sponsor: **Rockford Aeromodelers.**

June 29 — Fresno, Calif. (A) Fresno Monthly FF Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr. W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

June 29 — Arlington, Tex. 2nd Annual Golden Triangle RC Clubs WW I Contest. Site: North Lake Flying Site. D. Downing CD, 403 Monroe, Arlington, Tex. 76010.

June 29 — Odessa, Tex. (AA) Odessa-Midland 13th Annual CL Contest. Site: Ector Airport. L. Hood CD, P. O. Box 6622, Odessa, Tex. 79760. Sponsor: **Prop Busters of Odessa.**

Straight and Level

Continued from page 6

This Week.

On Whitehead Day in Connecticut last August 14, there appeared three people who had known Whitehead. Now, it has been charged by a renowned historian, who really should know better, that ". . . Whitehead never did anything worthwhile in his whole lifetime." Previous opinions of "qualified" historians and Orville Wright stated Whitehead never built an engine that would run. Others that these engines could not run for long periods.

Peter Politi, 82, recalled working at the McKenzie foundry where castings were made for Whitehead. He recalled vividly that Whitehead ran his engines for tests in excess of one hour, and that they ran perfectly at all settings. (In 1908-09.) These are sworn documents. A neighbor of Whitehead testified she was not able to sleep due to long hours of engine testing. Her statements centered on 1900-01.

A Whitehead engine successfully powered Charles Wittemann's flights in 1909. Whitehead engines were advertised, distributed, and sold nationally.

Cecil Steeves' brother (Cecil is close to 80) spoke of the Whitehead flights. He also recalled a visit by the Wright Brothers to Whitehead's shop on Pine Street, *prior* to 1903. This visit was witnessed, and testified to, by Anton Pruckner, Julius Harworth, and Steeves. Pruckner, Whitehead's mechanic, and witness of the flights, has been interviewed by the Smithsonian, Cecil Steeves begged the Connecticut Aeronautical Historical Assoc. to arrange a meeting with a Smithsonian representative. Steeves could have described the 1900 and

1901 flights. He died without this interview on December 26, 1968! But Steeves is on a tape.

In June of 1968 a 92-year-old man who claimed he saw Whitehead fly made interesting statements about locations of the flights. The locations coincided with places named by other witnesses (unknown to him), never before published. Said Frank Lanye, "Don't waste your time coming up here to interview me. I know nothing about airplanes. I didn't even know Whitehead. So please, save yourselves a lot of trouble, I only watched him fly."

Since 1901, the Whitehead case makes strange reading. This present column won't go into these matters in detail, but questions can be properly raised. Why have so many anti-Whitehead opinions been zealously endorsed in high places? Why was a certain historical volume endorsed, which volume was withdrawn after the American Aircraft Modeler article of last November? Why have certain files not been inspected by authorities invited to do so? Why did one authority refuse such an invitation some twenty years ago, then again in 1963?

Recently retired Assistant Director of Smithsonian National Air and Space Museum, Paul Garber (interviewed Pruckner and Lanye), said, "In my opinion Whitehead is deserving of recognition for having made limited flights in powered aircraft during the period of 1903 to 1908 along with the Wrights and Santos Dumont. CAHA should be commended and supported for their research interest and should be credited for having uncovered his true relationship to history." The word "limited" should be noted, and the general date 1903 — which is the same year as the Wrights' first flight. Information which supports the 1903 date also supports flights on August 14, 1901.

In 1963, the pilots and officers of the 9315th Air Force Reserve Squadron, Stratford, Conn., initiated the first official investigation of the Whitehead affair. Having set out to prove the Whitehead legend a myth, their five-year study instead revealed one of the most remarkable stories to come out of history of aviation. Late in 1963, the 9315th was joined in the venture by The Connecticut Aeronautical Historical Association. One wonders if CAHA will deny pressure from high-ups in industry to terminate the Whitehead research?

The two groups gathered Whitehead's full life story, interviewed witnesses. They have old articles, his memorabilia in hardware and early steam engine model, and photographs from the Whitehead family. The Air Force Museum's Research Division has stated that Smithsonian investigation of the Whitehead matter would be appropriate. "Regardless, he apparently did fly and thereby became part of the overall story of pioneer aviation in America," stated Royal D. Frey, Chief, Research Division, of the Air Force Museum. "By doing so, his record should rightfully come under the purview of the National Air and Space Museum which is not limited to Air Force history as is the Air Force Museum."

In the summer of 1966, during a visit to Germany by O'Dwyer and Miss Randolph, with a Whitehead file which had been provided to the Smithsonian seven months

before, a German newspaper seeking confirmation of these visitors, received a cablegram which stated, among other things, that ". . . The Smithsonian has no documents . . . that Whitehead was a serious inventor and asserted in 1901 to the Scientific American magazine that he had made a motor flight of over seven miles . . . The Smithsonian Air Museum is the best and most serious source in this land and so long as no data comes from there the record will doubtless remain with the Wrights."

Perhaps one of the reasons why information on Whitehead was so slow to surface is the fact that, unlike the Wrights, he has come to attention "out of nowhere." Actually, like the Wrights, he was a three-dimensional human being, scientifically and mechanically capable, and had been given to equally long research. In 1965 Whitehead's books were found and studied by O'Dwyer. On page 97 of one, along with Whitehead's grease-smudged finger prints (on every page), were found Count D'Esterno's design — 1864 — and D'Esterno's theories as set down by Chanute. Whitehead's No. 21 machine was quite similar and included the drum and rope control described! Whitehead's use of variable sweep makes him America's pioneer of the F-111 swing-wing concept.

Ninety-five cents of his every dollar was expended on experiments and aircraft. His daughter Rose recently recalled, "The only time we had meat on the table was in July when we could go out and sell the blackberries we picked . . . he'd hide colored eggs and teach us to yodel. He loved children. They ran through his shop every day in search of small cookies and candy he hid every night . . . you cannot know what it has been like all these years to know he was a good and honest man and listen to the world call him a farce and all the horrible things they said . . . he had never been bitter over his lack of being recognized, but it hurt when we couldn't afford a stone for his grave."

One can sympathize with the Smithsonian. For years the Langley-Wright debate went unsettled. And, now there is another legitimate contender, Whitehead. One thing is positive: no one will prove he did not fly.

Can we hope that the Smithsonian will face up to the Whitehead challenge? This editorial only scratches the surface.

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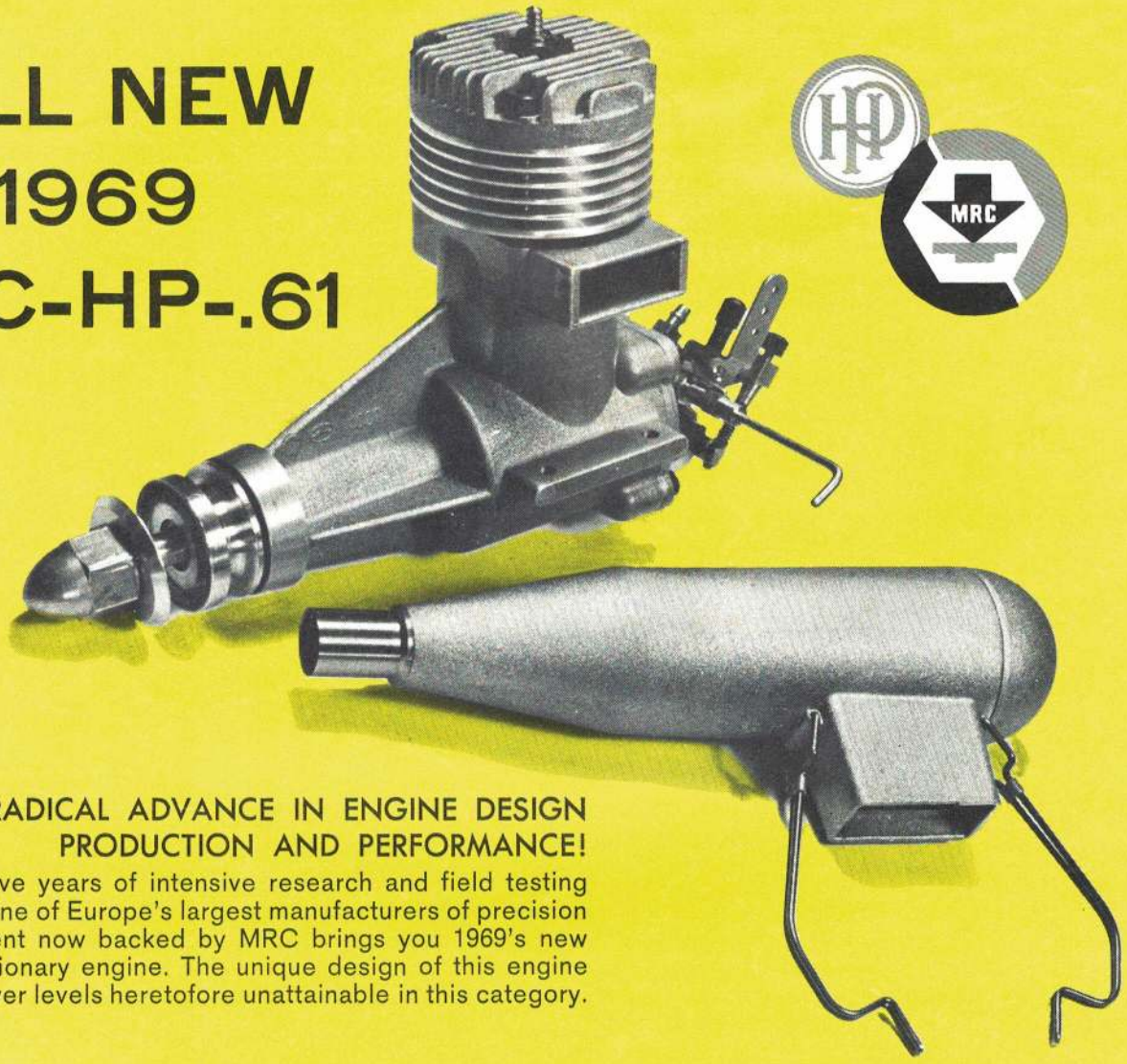

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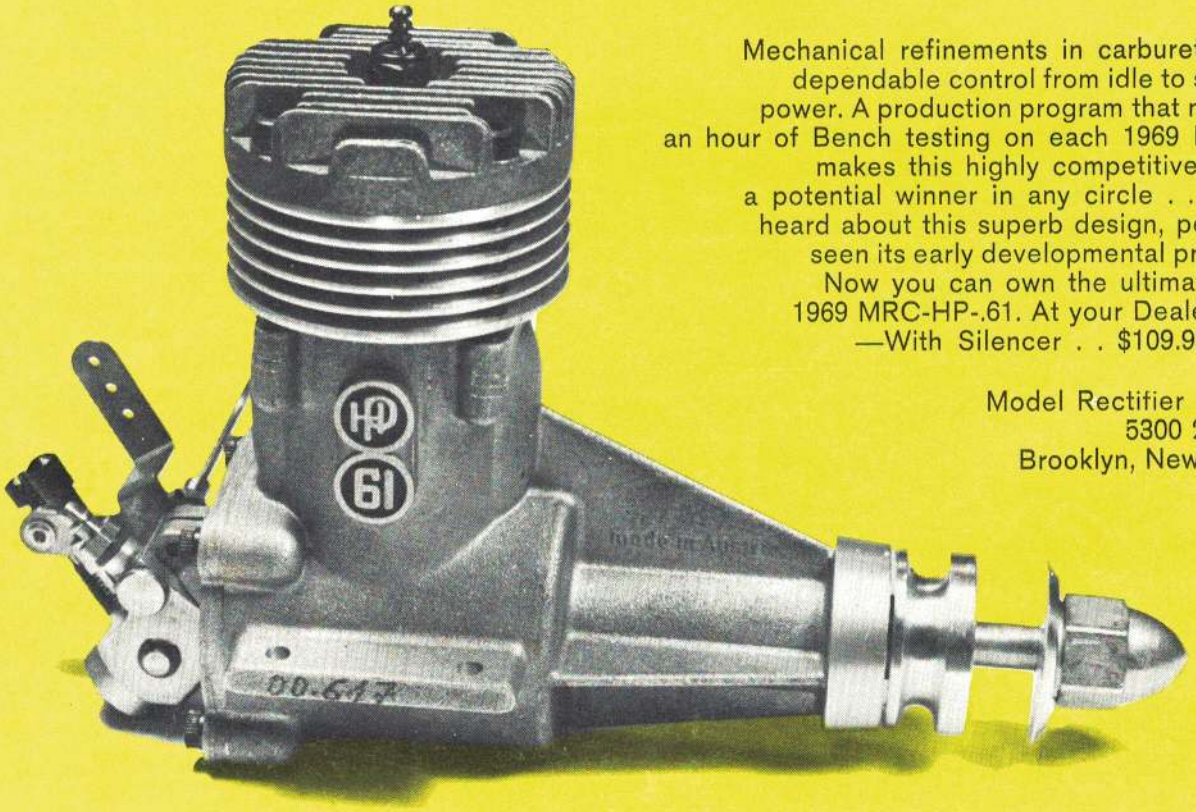

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