american aircraft MODELER

APRIL 1969 60c 7/-

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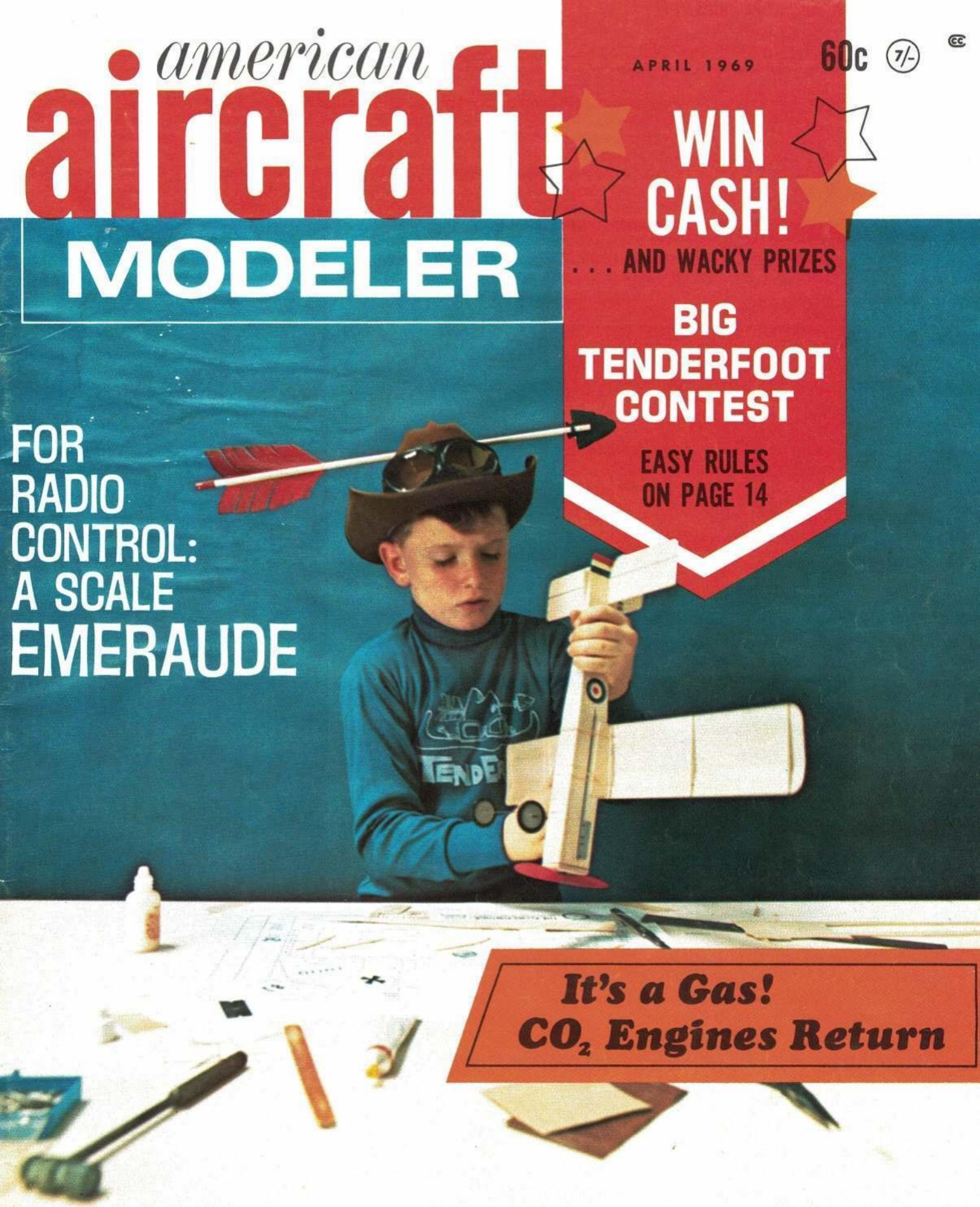
. . . AND WACKY PRIZES

BIG TENDERFOOT CONTEST

EASY RULES ON PAGE 14

FOR RADIO CONTROL: A SCALE EMERAUDE



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O.S.

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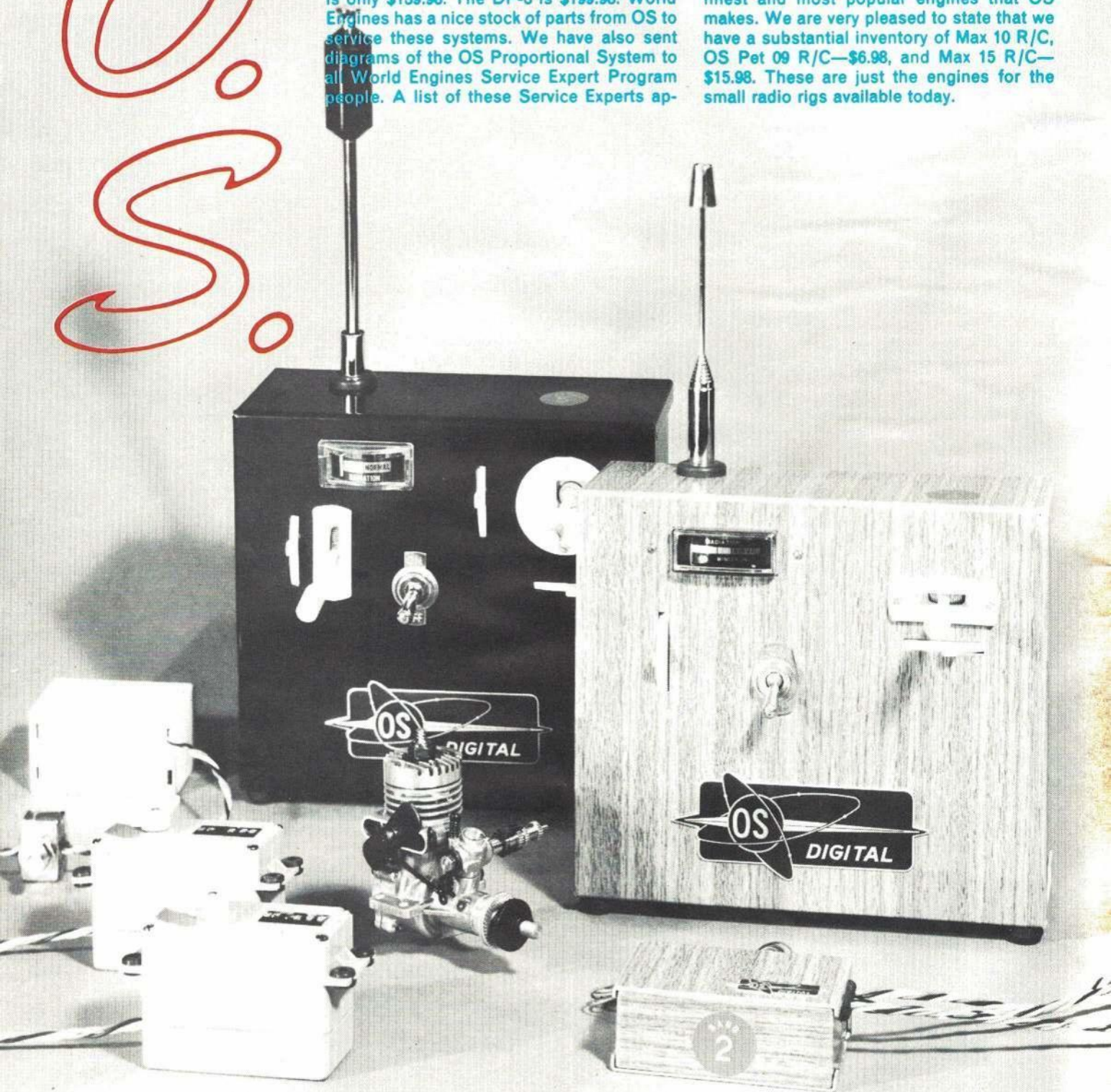

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VOLUME 68, NUMBER 4 APRIL 1969

COVER PHOTO: The ardent Tenderfoot is James Marks, son of AAM author Fred Marks. The model is the Flying Funtique, the little crate you'll want to build for that Tenderfoot Contest. Photograph by Bob Lautman.

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STRAIGHT AND LEVEL

One of the oldest and most revered forms of modeling is rubber-powered scale. What is its attraction?

IS the rubber-powered flying-scale model dead? Why is it important to ask such a question? The immediate answer, if you think in terms of kit models and kids, is that the you-wind-up-the-prop scalers have been hanging right in there for years. But we are thinking of the magazines, and that is something else again.

The rare contribution of an "old-fashioned" flying scale model is a startling experience. Once in a blue moon an editor will see fit to publish plans for such a model. Of course, we mean a real scale job, not some quickie scale-like sport design. For years we all seem conditioned to a philosophy that, if it hasn't got a gas engine, no one but a stone-age hermit will take the project seriously. There is something rotten in Denmark.

Why, for heaven's sake, does it have to use a gas engine? Because real planes have internal combustion powerplants? Well, whoever heard of a real engine with one monstrous cylinder, which turned, perhaps more than 20,000 rpm with some ridiculous tiny prop which hardly sticks out beyond a pot cowl? Do real planes sound like angry hornets? OK, a rubber motor doesn't sound like an engine either, but at least the sound is left to your imagination. And what about speed? If you take the scale speed — that is, so many body lengths passing a point in an interval of time — you'd have a trans-sonic Curtiss Jenny, and jet-like Piper Cubs. Part of scale is how the model looks. An equally big, if not bigger part, is how the darn thing flies. If it doesn't fly scale-like why build it?

That rubber power might be the ideal flying scale activator, at least in free flight, no one would dare claim. Why not? The good rubber job trundles along just like the real thing when released, raises its tail, lifts off realistically, then putters down field for a lovely landing. You can get a gassie to do something like that, but by the time you knock down the thrust with a little, screaming prop, you have an audible monstrosity.

Not too many years ago the name of Earl Stahl was a modeler's household word. Earl had many dozens of swell little crates published in all the magazines. They were remarkable for their simple structure, realistic ooks, and flying ability. You could build one for 1/500th the cost of some model airplanes we have flying today.

Another old-timer once internationally famous was Joe Ott. Before he became a leading manufacturer, he, too, published a series of fine flying scale ships in the old Popular Aviation — today's Flying magazine. Equipped with celluloid wheels his Fokker Universal weighed 1⅞ oz. His 24-in. SE-5 and Nieuport 17 were great favorites of ours. We scaled them up to all sizes, as we did his Camel, Halberstadt, Spad, Boeing P-12, etc. On a quiet evening you could walk, yes walk, beneath the SE-5 as it sailed across a ball field. Scaled to 45 inches, the Nieuport and Boeing were fabulous. One thing we did learn was that you cannot put too much ballast in the nose of any scaler, up to the point of achieving a proper center-of-gravity location. Take the Camel.

The Camel obviously is a poor selection. So we think. But trim it out and it climbs and flies like mad. Nothing the matter with it. Inspired by Ott we tried endless originals, scaled up to include six-foot Bellancas and even a seven-foot Cessna. We can still see some guy's nine-foot Fokker soaring over the berry patch. The Fairchild 71 is one of the most fabulous fliers imaginable, with its ⅞-in. thick wing on a 36-in. span. The Curtiss Robin. Travelaires. Just about anything.

Light construction did not prove weak. Lightly built crates have sensational endurance. Recall six-foot Bellancas with ⅛ x ⅜ longerons! Speed and weight being low, kinetic energy is minimized — how hard you hit, buster! Jap tissue on six-footers and, outside of twig and weed poke-holes in the covering, damage was seldom suffered.

There was one problem, though. It wasn't a problem before machine-made and plastic-cast props became taken for granted. Yes, you guessed it. The prop had to be carved. An 18- to 24-in. prop for some of those giants had to be hacked from a balsa 2 x 4. But no one protested. The results were worth it.

At 20 to, say, 30 inches of span, a simplified, somewhat off-scale rubber job is a fine free-flight project even today. You'd enjoy the art of putting together a light framework and covering it with paper — or maybe light silk in the bigger sizes. Adjust the ship to fly in circles to stay within the confines of a small field, and many a rewarding flight will be had. Maybe such a model won't shine in a wind. But if it is windy go back to your trans-sonic flying brick. Drag out the lightweight on a calm morn or evening and let the swallows chase it. Install R/C if you must!

The most exciting flight for any type of model we ever had was a rubber job, a Nieuport 17. This 45-incher was winder-wound in the twilight and released from an ROG. It disappeared into the dusk. Funny prop and rubber-unwinding noises were wafted more and more weakly to the ear. Finally, across a huge orange disc of an autumn moon, passed the silhouetted WW 1 pursuit, just like a friendly witch riding her broom.

It's a shame, really, that the sophisticated modeler writes off the wonderful rubber scale jobs. They have got personality, and don't you forget it!

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Will take a year

I looked at the "You Said It" section in the Dec. '68 issue and was interested in what Bruce McMorris said about the R/C problem for juniors.

I would like to get a Galloping Ghost system, but it will take me about a year or so to get enough money.

I'm currently finishing a Skylark by Sterling, which has taken six months so far. I hope you (Ed.) read this and have some opinion on this subject.

Steven Remell, Stateline, Nev.

An opinion shared

Had to write and comment on the letter from Mr. C. Besancon (Dec. '68 "Critics Don't Bug Us") and let him know his opinions are shared by others.

The critics, it seems, may be found at most every meeting, show, contest, or event. Glad to see that the fellows who are most generally being criticized (who are most generally doing the work), don't let themselves become discouraged.

Keep the fine magazines coming. They provide an excellent cross-country interclub link.

Dick Ruckel, Editor, Prop Busters Newsletter
Willowick, Ohio

R/C too commercialized?

I have just read the letter from James Kloth in the Oct. '68 issue, and thought I'd throw in my two cents!

I've also been in R/C off and on since 1958. I'm a ham radio type (W5NWG) and like to tinker as well as fly and I have had a lot of fun with the simpler types of gear. Also, I love F/F, powered or not, and have flown a lot of "school yard" C/L too, so I appreciate most phases of the hobby. I must agree with Mr. Kloth's feelings because all during my inactivity, there seems to have been a subtle, but definite change in the R/C part of the hobby.

It used to be that to fly R/C you had to be an accomplished free-flighter. Nowadays you'll see fellows on the field that don't know what they are doing when it comes to trimming an airplane and many of the other fine points of experience. It's ceased to be happy, and is now called a "sport." Ugh!

I hope we are not seeing the downfall of a great hobby. So many other things today have been commercialized to a point where they are no more fun.

I don't see where a R/Cer has anything to stick his snout in the air about. All he's done is spend more money. It takes a great deal of skill and experience to do well at ANY phase of model building and flying.

SSgt. Arthur Roberts, Saigon, Vietnam

An aid to astronautics

Upon receiving the Nov. '68 issue I, like most of the other 1200 members of the National Association of Rocketry, immediately turned to the pages devoted to Model Rocketry. And, like many of the other members of the NAR, was gravely disappointed at the absence of "Countdown," or at least some other article on Model Rocketry.

Your magazine provides some of the best and most up-to-date information on Rocketry available today — even though the space devoted to the hobby is small.

Of course, you did promise that Rocketry articles would reappear sometime this winter, but until then, could we please have some sort of a filler — something more comparable to the old bi-monthly "Model Rocketeer." Please bear in mind that this information is just as, if not more, important to Astronautics as it is to Aeronautics.

Joshua Hill, New York, N. Y.

With the help of the rocketry industry, we are gradually improving this coverage. But we do not get suggestions from authors qualified to write on the subject. Ed.

What Walker stood for

I read your editorial in the November issue of American Aircraft Modeler in which you talked about the late Jim Walker and what a giant he was in the model industry, and why there aren't any more people his equal in the industry today. Well, after reading it, I decided to write.

First of all, we model builders have turned professional. This is no longer a hobby, but an art. How demanding this hobby is! When you realize how much time and effort goes into one of our models, not to mention money, this doesn't seem to be the hobby of a few years ago.

To win in a contest today, you have to be an expert and really practice to win. I think many modelers are too busy to help a beginner. Would a R/C man who flies those big, fast high-performance jobs stop and help a beginner with a single-channel ship, or would he feel degraded?

I believe it takes a special kind of guy to take time out to help or amuse a beginner. Not too many guys like that exist. The companies take the same attitude. Some companies only try to sell the models, and don't really care whether they fly or not. To them, it's just a business.

Jim Walker was such a great promoter for two reasons: First, because he liked to fly model airplanes — any kind. Second, he liked kids. He had a warm spot in his heart for kids and model planes.

The key word to this hobby is promotion and that's what Jim Walker stood for.

David Fortuna, Evington, Va.

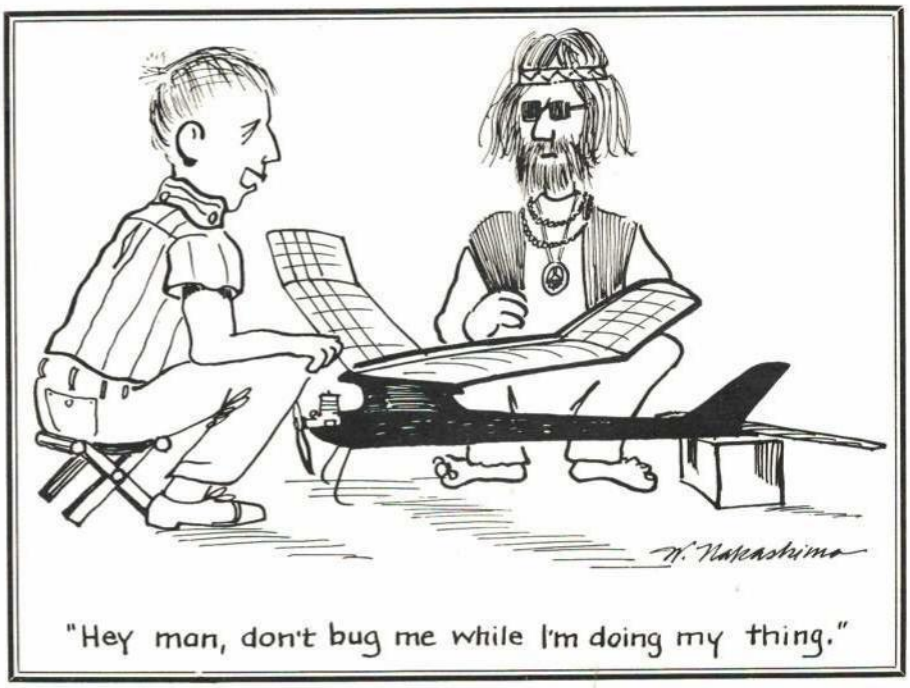
Wants full-color legend

The biggest criticism that I have of your magazine is that you have no color instructions on your centerspread. You, of all people, should have caught this. But, anyway, a full-color legend would be very appropriate on these centerspreads.

I buy this magazine for two reasons: Your article on Scale Techniques for the Plastic Modeler, and your two-page centerspread in color, but minus any color instructions. I am sure that you would increase the interest in your magazine ten-fold by adding a full-color legend to each one of your centerspreads.

Plastic kit model manufacturers have been very lax on their detailed color instructions. How is the plastic scale modeler going to gain perfection with this indifference on the part of the manufacturers and other publishing media.

As an illustration, Floquil Products, Inc., Cobleskill, N. Y. 12043 puts out a color chart of 33 flat colors with a color code number which could be used in your color legend. In the case of gloss colors, Pactra



and Testors could fill the bill. And it is very important to specify flat or gloss paints.

In reference to your Dec. '68 issue, just to prove a point, is the bottom of your fuselage and landing gear silver, light gray, or an off-white? Now, what is the actual color of the bottom of the wings? It's hard to determine just exactly what color this is supposed to be.

Would you please correct this situation as far as the American Aircraft Modeler is concerned?

Thomas G. Balliet, El Paso, Tex.

We've asked Mr. Karlstrom how he can help. The problems appear simple, but is tough. Ed.

R/C gliders — the most!

We have available to us, in all price ranges, radio equipment which is light, small and dependable. And because of the small size and weight factors, glider-flying is possible as never before in flight endurance.

For those modelers that are getting just a little tired of those fast, nerve-wracking flights and spectacular crashes that usually total your model, I suggest trying the R/C glider for relaxing and graceful flights most people never would think possible.

If your controls jam up and the glider does come in hard, the odds are that there will be very little damage because of the light weight and slow speed. And here is really a place for that single-channel radio gear that's been gathering dust on the shelf. Most small gliders will fly well on single-channel, but I wouldn't advise it on an 8-ft. wingspan job. One of these will carry full-house and will perform so smoothly in the air it is a beautiful thing to see. I tried different gear in my 8-ft. Baron and when they get that big, the more controls, the better.

At present, I have the Snipe 2 on the building board. This kit by P.C.M. is one of the simplest I have ever built and all parts are pre-cut and fit perfectly. The improvement in the kits seems to be keeping pace with the improvement in the R/C gear. I read Straight and Level a few issues back which said "Let's put the fun back in model flying." I have found that gliders can do just that and I highly recommend them.

By now you must be wondering why you haven't heard any gripes. I just don't have any. I have adjusted my buying of supplies to those sources that give me rapid delivery and full satisfaction all around so what's to grumble about now?

Tony Michael, Bryant, Wis.

Lawn-mower handy?

I have a copy of the Dec. issue in front of me and it is turned to "You Said It." I read with great interest "A Junior speaks out" from Bruce McMorris, where he talks about the reasons why young people do not take up model airplanes as a hobby or relaxing sport.

He specifies money as one problem, at age 14 especially. When I was 14, I also didn't have a job. At 16 I didn't. Now, at 18, I'm just starting. At 14, all I did was mow lawns, and that was enough to keep me flying rubber-powered free-flight planes. I remember how I'd go to the nearest hobby shop and buy a Comet kit and save the cellophane wrapping for windows, and when I ran out of tissue for covering, dig around closets for extra gift-wrap tissue. By working harder, I graduated to a Cox control-line plane. I flew this for quite a while, then I overheard some modelers

talking about "cheap radio-control stuff nowadays," so I looked into the possibilities of buying same.

Twenty-five dollars for a small silver box! Why do single-channel receivers have to cost so much? But I saved, and economized by buying a kit instead of a ready-built one. Same for the transmitter, which I bought about six months later. By now I was 15 and had my radio. And when I went to a hobby shop, I happened to see a model airplane magazine that had a biplane, single-channel, 15-powered, in Aug. '65. I started it in November.

Now, three R/C planes and three years later, I finished that plane. I'm not sure how, but in those three years I managed to fly on one channel only, and have only recently discovered throttling is nice. And in those three years, I had a blast.

What I'm trying to say is, Bruce, have patience! Keep plugging at those restaurants. Sooner or later they'll hire you so you'll stop pestering them. And keep that Falcon 56 going, it's a good aircraft. Meantime, do you have a lawn-mower?

By the way, that biplane was underpowered with an O.S. 10 R/C, so I will install a 15 soon. Yes, I'm chicken to fly the thing, but I don't think planes are worth building unless they are going to fly.

Marc Bird, Fountain Valley, Calif.

Anyone for airships?

Just picked up my first copy of your magazine and found it very interesting. While I am an avid aeronautical historian and book collector, I am not what you would call a modeler, though I have assembled a few plastic kits.

I noted your editorial in this Oct. '68 issue concerning how model aeronautics has something to offer everyone who is interested. This is true except for a real void in one area — airships. Aside from a plastic Navy blimp produced by Ideal about ten years ago and a couple of "Graf Zeppelin" models offered in ads in your magazine (one an inexpensive paper job and the other a rather expensive built-up version, I'm reluctant to tackle in my very inexperienced state), there is nothing, at least, to my knowledge.

I am writing to ask, if you know if there is or has been any real interest or activity in the field of airship-modeling, either flying or non-flying. Has anything ever appeared in your magazine on this field. I would be very interested in taking up airship modeling if the opportunity existed, and I am sure there are others who would join me in this as there are quite a few serious airship-historians. Offhand, airship modeling would seem to offer some very unique and fascinating possibilities, especially in the field of R/C.

I would be interested in hearing any comments you may have regarding this.

Z. Hansen, American Aviation Historical Society, Chicago, Ill.

In the Dec. '68 issue, we had an airship feature titled "R/C Los Angeles," by John Wick. Unfortunately, it was designed for dangerous hydrogen and, in switching to helium, sufficient buoyancy did not remain. So our readers tell us, alas. We hope to publish an improved dirigible later on. Ed.

Got a Fireball?

After reading your editorial on Jim Walker in the Nov. issue, I became interested in some of his projects.

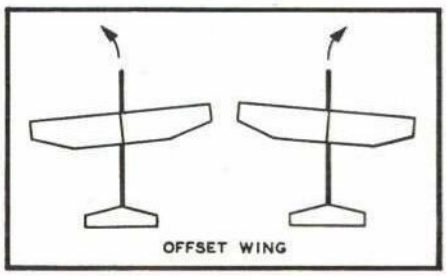
I recently built and flew a somewhat modified Ceiling Walker which performs

very well. However, I have searched all over and cannot find a Fireball, or even the plans of one.

I would greatly appreciate any and all information you could dig up for me.

John Attinello, Alexandria, Va.

Any mail for John, sent to our attention will be forwarded. Ceiling Walker, incidentally, is a rubber-powered helicopter. Ed.



Mini-Glider correction?

. . . I have never used offset wings for adjustment or had any problems with them, however, if memory serves, the drawing on page 14 (second one down from the top left corner) of the Jan. '69 issue showing the effect of offset wing (one tip foreward) is wrong, also it doesn't agree with the text.

W. B. Roosa, Waterloo, Ontario, Canada

Bill added the above as a postscript to a longer letter. Is he right — or is the text of the original Tenderfoot article? Here is the drawing as it appeared. What do you, the readers, think? Ed.

Rocketry rewarding

I want to thank you for your excellent articles on model rocketry.

I have been in model rocketry for about two years and it's been rewarding. I have been in the NAR for a year and without it, I might have lost interest in model rocketry. After receiving my AAM and reading the articles like Countdown and Model Rocketter, I got going. Now I spend $5 to $10 a month on rocketry.

Thanks for the faith in the hobby.

Mike Bradley, Austin, Tex.

R/C info needed

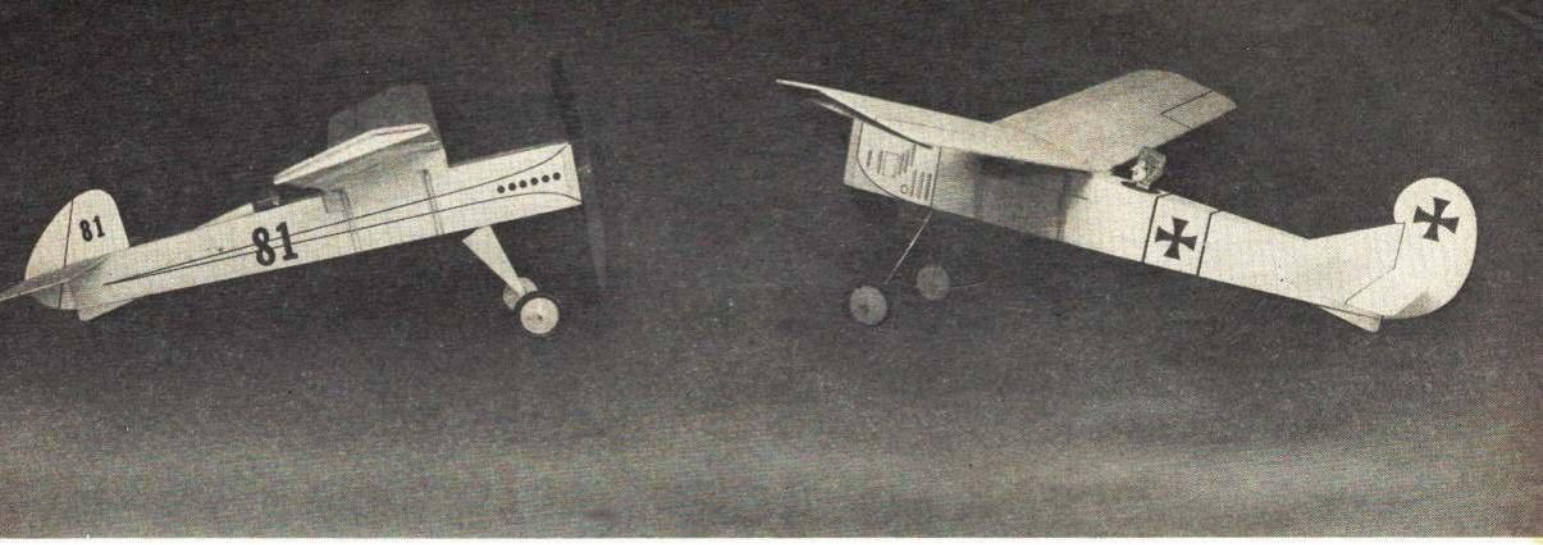
I am 13 years old and am interested in R/C modeling. Up until recently I haven't been able to even think about it seriously because of cost. Even now I can't afford much more than $275 for Radio-Control equipment. I want to know if you can send me some brochures or addresses of radio equipment dealers that are reputable.

I can't tell you how much I enjoy your magazine, but I resent one letter in your May '68 issue. Frank E. Millis, Sr. said: "The main reason for the decline and fall of the model builder is just plain disinterest on the part of our youngsters." Maybe I am wrong, but I took this as putting all of the blame on kids when it doesn't belong there. We don't usually have the money to buy that expensive equipment. Kids aren't lazy, we just can't get jobs that pay that kind of money. I just happened to be lucky.

I would appreciate the information on R/C equipment.

Bob Hayles, Valdosta, Ga.

Bob, you can get data by writing the manufacturers who advertise in A.A.M. Ed.



Flying Fun

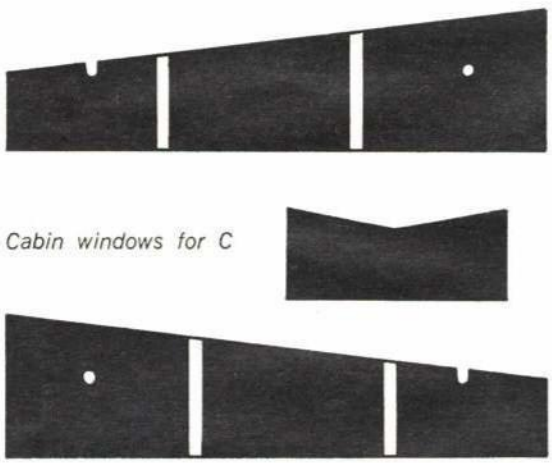
WILLIAM HANNAN

HERE'S a simple-to-build model that may be finished in any manner of your choice. If you like antique "aeroplanes," you can decorate your model to resemble one of the famous vintage channel-crossers. If World War I holds your interest, your Funtique can be finished to look like either an Allied or German machine. Perhaps classic airplanes of the 20s or 30s are your dish . . . then try the Curtiss Cabin, the 1909 Blearyeye, or maybe the sporty little Dooalot Racer.

Actually, the model may be converted from one style to another after it is finished, but it is suggested that you pick out one type at the beginning and stick with it. You can follow one of the examples shown in our photos, or let your imagination go to

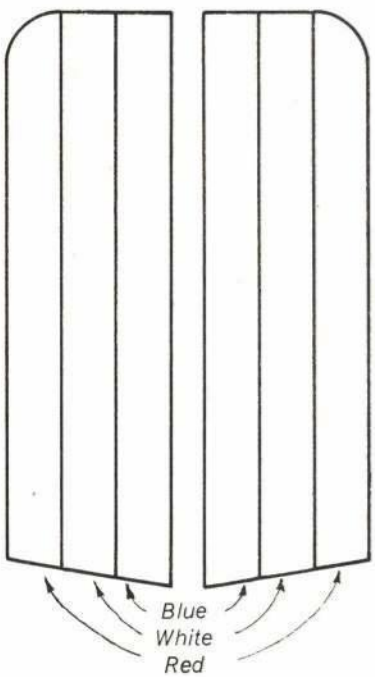
S = S.E. 4⅞
B = Blearyeye
C = Curtiss Cabin
R = Racer
F = Fokker

Cockpit for B, S, R, F



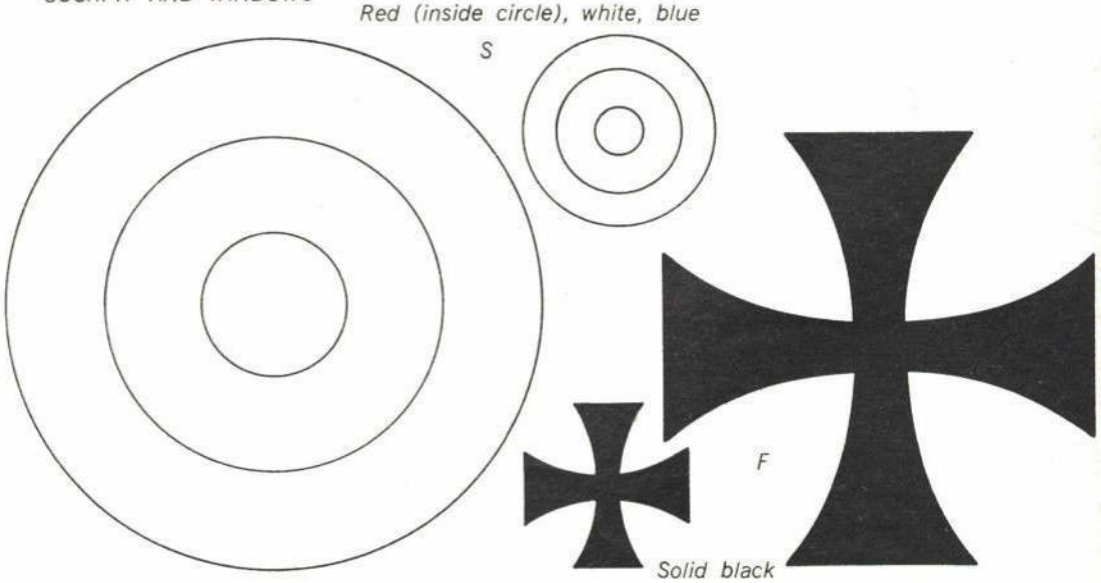
Cabin windows for C

COCKPIT AND WINDOWS



Red (inside circle), white, blue

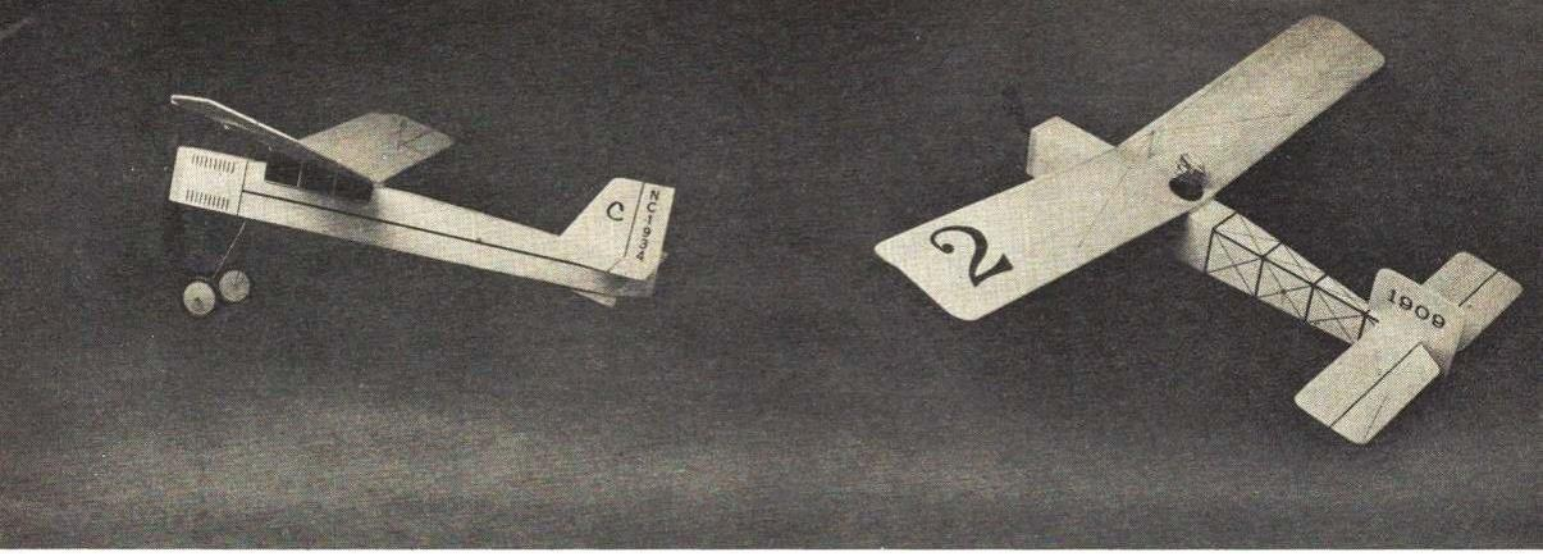
S



F

Solid black

WING, FUSELAGE AND TAIL INSIGNIA



tique

work and come up with your own design. How about a Sopwith Plop? Or maybe an Oldport 17? Or a Clodrun Racer?

This model is constructed almost entirely from 1/16" sheet balsa. Use care in selecting good wood, and you will have a much better performing aircraft than one built out of "any old wood." When you are choosing balsa, look for nice light white stock, and sight down each piece to be certain that it is not twisted or warped.

Study the plans and photos before you start building. This will enable you to understand the way the various parts fit together. By reading the step-by-step directions and checking with the pictures, you should be able to construct the model easily. If you do run into a problem, ask another modeler or an older person for help. You may even be able to talk them into building a Funtique of their own!

CONSTRUCTION

Fuselage: The fuselage or body is quite easy to build, and very strong. First, make paper patterns of each part, including one top, one bottom, two sides, and the various bulkheads (formers), which are identified on the plan as F-1, F-2, etc. Note that slots must be cut for the tail skid, landing gear, windshield (if used) and pilot. Also make the small holes in the body sides for the rear rubber peg.

Place the fuselage bottom flat on your workbench and glue on the bulkheads, which should be carefully aligned both from the top and side view. Next, add one fuselage side, being careful that it lines up exactly with the edge of the fuselage bottom. Install the remainder of the bulkheads, as shown in the photos. The bulkhead closest to the nose is made of three layers glued together. This creates extra strength where it is most needed. After all the bulkheads are installed, the second side may be added. It may be helpful to pin or tape the side in place while the glue dries.

Next, bend the wire landing gear to the shape shown on the plans. Notice that the landing gear is bent forward at a slight angle, as may be seen on the side view. Insert the landing-gear wire between the two bulkheads which are on either side of the landing-gear slot. Fill the slot with glue, both from above and below the wire, and put aside to dry, preferably overnight. This glue joint must be strong, or your landing gear will rip loose on the first hard landing. The top of the fuselage may now be added. Sandpaper all four corners of the assembly until all edges are smooth. Insert and glue the tailskid into its slot.

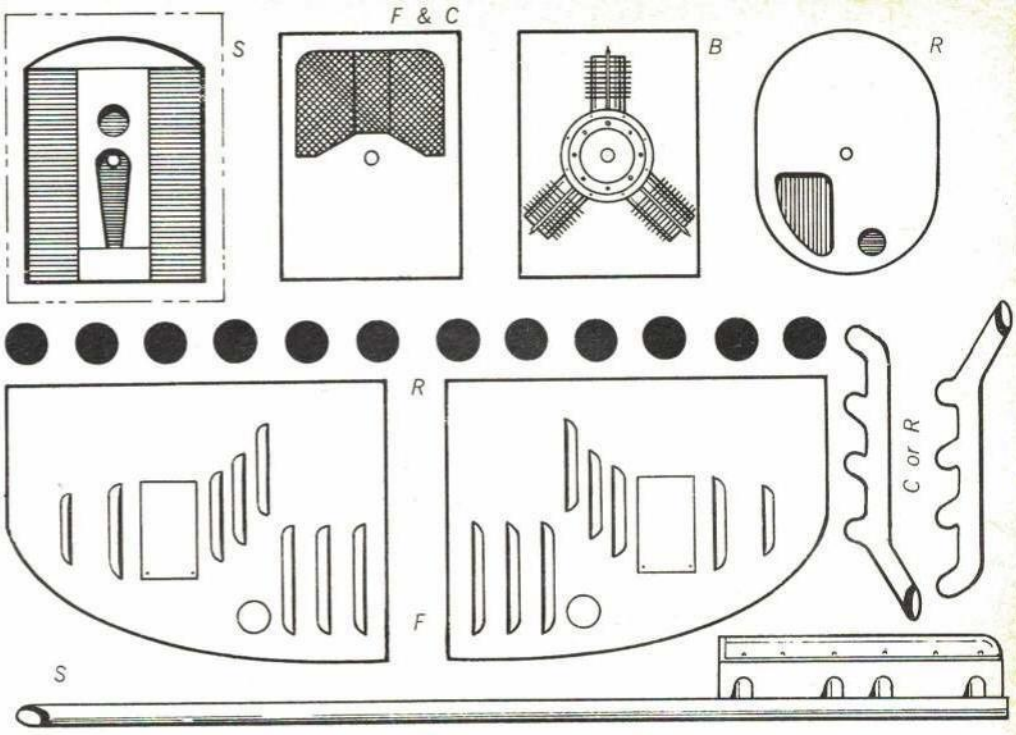
The nose block is made of laminations in the manner of the front bulkhead. When making these "plies," alternate the direction of the wood grain. One ply should have vertical grain, the next horizontal, and so on. Stack the parts together and place a weight on top until dry. Be sure that the rear of the nose block is a snug fit into the front bulkhead, or it will fall out when the rubber motor runs down. The fit can be tightened if need be, by gluing a thin strip of paper along one side of the back portion of the nose block.

After the nose block assembly is thoroughly dry, drill a hole in it for the propeller shaft bearing. This bearing is made from a short length of metal tubing. Either aluminum or brass will work fine, but aluminum is easier to cut. Roll the tubing back and forth under a sharp blade to score a groove around it. Then snap it apart, and lightly sand the burr off the tube's end. Roughen up the outside of the tubing with

Use a stuffing stick (see page 15) to insert rubber motor in the fuselage. Short dowel peg holds aft end of the loop of rubber.

Stretch-winding allows more turns and longer flights. Stretch motor 15-23"; start to wind. Move in as you pack in the turns.

LETTERS AND NUMBERS



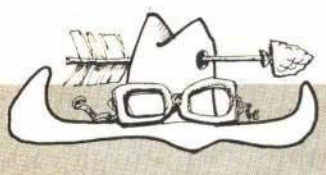
RADIATORS, ENGINES AND EXHAUSTS

a file or sandpaper so that the glue will be able to get a grip on it. Glue the tubing into the nose block, taking care that none of the glue runs inside the bearing hole. Next, glue on the paper nose-block decoration of your choice.

The prop shaft is bent to shape, as shown on the plans, and inserted into the bearing in the nose block. Add three or four washers to serve as thrust bearings. Place the propeller of your choice on the shaft and be certain that it has enough clearance to revolve freely. With some propeller designs, it may be necessary to add extra washers to obtain enough space between the prop blades and the nose block. Most commercially produced propellers are slightly out of balance. To improve performance and reduce vibration, sand the heaviest blade, until the prop will stay horizontal on its shaft, without one blade falling to the bottom.

Obtain a pair of wheels about 1⅛" to 1½" diameter. We used a pair of Williams Brothers miniature scale wheels since they help to give a vintage look to the model. With the Williams wheels, it will be necessary to glue short sections of metal tubing into the hubs to reduce the hole size. This is easy, because the same type tubing used for our prop shaft bearing can be used. To retain the wheels, you can bend up the ends of the wire axles, or glue tight-fitting electrical insulation on the axle ends.

Stabilizer: This is cut out using the usual pattern system, and the edges sanded and rounded slightly. This achieves three purposes: It streamlines the surface, reduces the weight, and perhaps most important, creates a workmanlike appearance. A little



NEW • TENDERFOOT CONTEST • NEW

Here's an easy-to-enter contest with fun and prizes for the Tenderfoot.

THREE first prizes — each $50 in cash — will be awarded (one in each of three age classes), PLUS Tenderfoot Hats and T-shirts.

Each age class will also have THREE runners-up, and they will receive $10 each, PLUS Tenderfoot T-shirts.

All winners will receive certificates of achievement and will appear in American Aircraft Modeler.

HERE IS ALL YOU DO:

- Build the FLYING FUNTIQUE — this month's featured Tenderfoot model.
- Send photos of your completed model with an entry blank to American Aircraft Modeler for judging.

OFFICIAL CONTEST RULES

1. Build the FLYING FUNTIQUE. Each entrant must build their own model.
2. Print your name, address, and your age (as of May 15, 1969) on the entry blank furnished or on a plain sheet of paper.
3. Four black-and-white, glossy photos must accompany the entry blank. Photos must be sharp and clear (not smaller than 3½ x 5 inches) and furnish these views of your completed FUNTIQUE: front view, side views (both sides) and a top view (as seen from the rear).
4. Mail your entry blank and photos to: Contest Editor, American Aircraft Modeler, 733 Fifteenth St., N. W., Washington, D. C. 20005. Do not send the model!
5. Submit as many entries as you wish. Each must be mailed separately. Only one prize can be awarded to an individual.
6. Entries must be received no later than May 15, 1969.
7. All modelers, both boys and girls, are eligible. The entrant's age must be in one of three age classifications: up through 10, 11 through 13, or 14 through 16 years. Contest is not limited to readers of American Aircraft Modeler.
8. No member or relative of a member of the staff employed by Potomac Aviation Publications, Inc. is eligible for contest entry.
9. Entries will be judged on the following, each having equal emphasis:
   A. Does model conform to plans?
   B. Appearance of surface finish.
   C. Amount of detail.
   D. Neatness of detailing.
   E. Originality and special effects (bracing wires; armament; machine guns; exhaust smoke; bullet holes; patches; insignia and wheel pants are typical examples).
10. Decision of the judges — AAM's editors — will be final. All entries will become the property of American Aircraft Modeler. None can be returned.
11. This contest offer does not apply in those areas where taxed or prohibited by law.

CONTEST ENTRY BLANK

SEND TO: Contest Editor, American Aircraft Modeler, 733 Fifteenth St., N. W., Washington, D. C. 20005

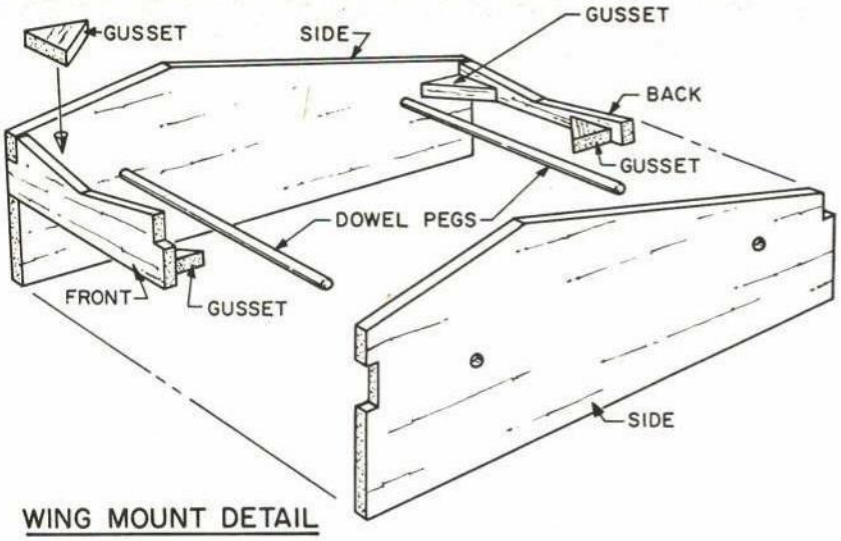
Here is my entry for the Flying Funtique TENDERFOOT CONTEST.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

My age, as of May 15, 1969, is _____ years.



WING MOUNT DETAIL

sanding is often the main difference between a so-so model and an outstanding one. Glue the stabilizer in place, being sure that the alignment is correct, as seen from both the top and rear view.

Select the fin shape to suit your model, and cut and sand it to shape. Install it on the model, and check that it is correctly located.

Wings: Each wing panel is made from one sheet of balsa 2" wide, one sheet of balsa 1" wide, and three wing ribs. Using tracing paper patterns, cut each part to shape and sand the edges lightly to make them smooth. Place the wide portion of each wing panel on your work bench upside down, and glue on each wing rib, being careful that they are in correct alignment. If the ribs do not seem to stay in place, they may be held down with straight pins or masking tape while the glue dries. Next, turn the panels over and fit the 1"-wide portions of the wings in place. If the rear edge is bevelled slightly with sandpaper, it will fit up against the 2"-wide sheet more snugly. Again, if the wood does not want to stay in place while the glue dries, use pins or tape to hold it.

Wing mount: The wing mount is made from a front piece, two side pieces, a rear piece, and four gussets. The wing mount detail shows the relationship of these parts. Cut out each part using paper templates as a guide. Be certain to follow the angles exactly, as they are important in making your model fly properly. The parts may be glued together, being careful that this assembly does not get twisted or out of line. Note that the gussets add strength to each corner joint. Next, the hardwood dowels are inserted into their holes and glued in place.

The wing mount may next be glued to one of the wing panels. This will give the wing panel an upward slant, or dihedral. When the joint is dry, place the other wing panel in position, but do not glue. Note that the two halves do not fit quite together, because of the dihedral angle. A little trimming and sanding will enable you to get a better fit. When you are satisfied with the joint, glue the second wing panel in place, checking to see that it lines up well with the opposite member. Take your time with this as the flight stability of your finished model will depend to a great degree on the alignment of this unit.

When dry, the wing assembly can be placed on the fuselage, and secured with two common rubber bands. Be careful when putting them on, because they can cause damage to the balsa wood, if stretched too tightly.

Decorations: Although the various makings are not really needed to make your model fly, they add a lot of character that

Continued on page 76

TOOLS

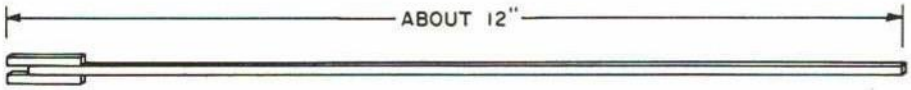
Modeling knife or single-edge razor blade.
Ruler or other straight edge.
Smooth sandpaper, such as #400 or #600.
Needle-nose pliers for bending landing-gear wire and propeller shaft.
Cutting pliers for cutting music wire.
Pencil.
Fine-line marker pen for adding decorations if desired.
Straight pins and masking tape for holding parts while drying.
A 1/16" diameter drill bit for drilling the nose block.

MATERIALS

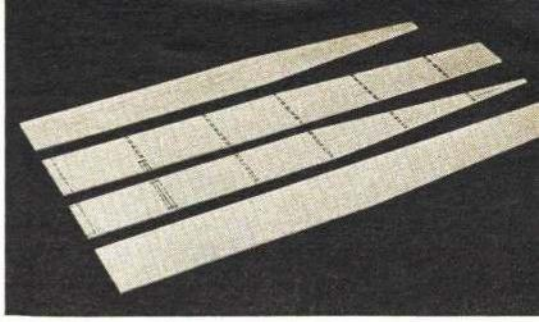
Several sheets of 1/16 x 2 x 36" sheet balsa. (Sorry fellas, I forgot to keep track of how many sheets I used. Maybe you can figure it out from the model.)
One piece of 1/32" diameter music wire for landing gear and propeller shaft.
One piece of 1/16" outside diameter aluminum or brass tubing for propeller shaft bearing and wheel hub bushings (if required).
One pair of wheels about 1 1/8" to 1 1/2" diameter.
Several small washers to use as thrust bearings. (In a pinch, dressmaker's sequins can be used.)
One 5 1/2" or 6" diameter commercially made plastic or wooden propeller.
Rubber strand for power. Recommended power to start: One loop of 1/8" flat Pirelli or one loop of 3/16" brown rubber. With experience in adjusting, more power may be used.
Glue.
Scrap of clear plastic sheet for windshield, if used.
Chart tape for decorations, if desired.
1/16" diameter dowels for rear rubber peg, wing mount pegs, and rigging mast if 1909 Blearyeye is constructed. (May be purchased at drug store. Ask for swab sticks.)

MISCELLANEOUS

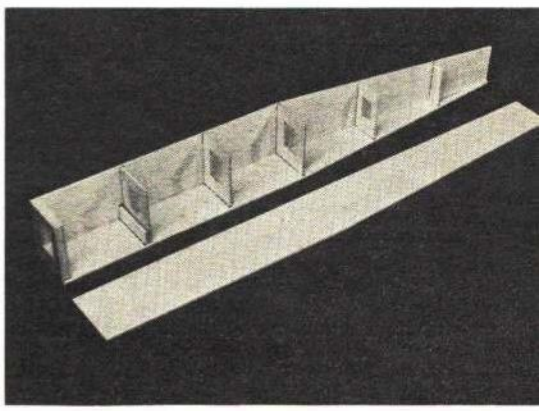
Rubber lube (commercial brand or castor oil).
Winder. Not strictly necessary, but will greatly improve performance.
Oil. Automotive or sewing machine oil: one drop on propeller shaft. Caution, do not allow regular oil to get on rubber band.



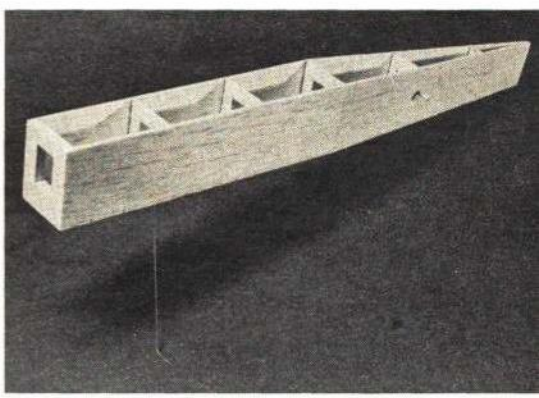
"STUFFING STICK"
FOR INSERTING RUBBER MOTOR
(MAKE FROM 1/8" SQUARE BALSA)



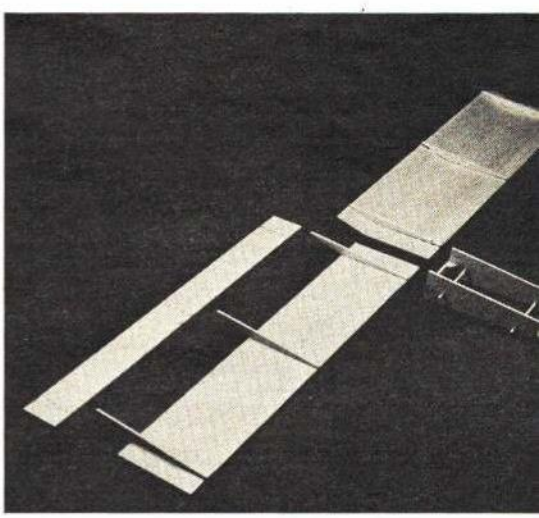
With pencil or ball-point, mark location of all bulkheads on the fuselage's parts.



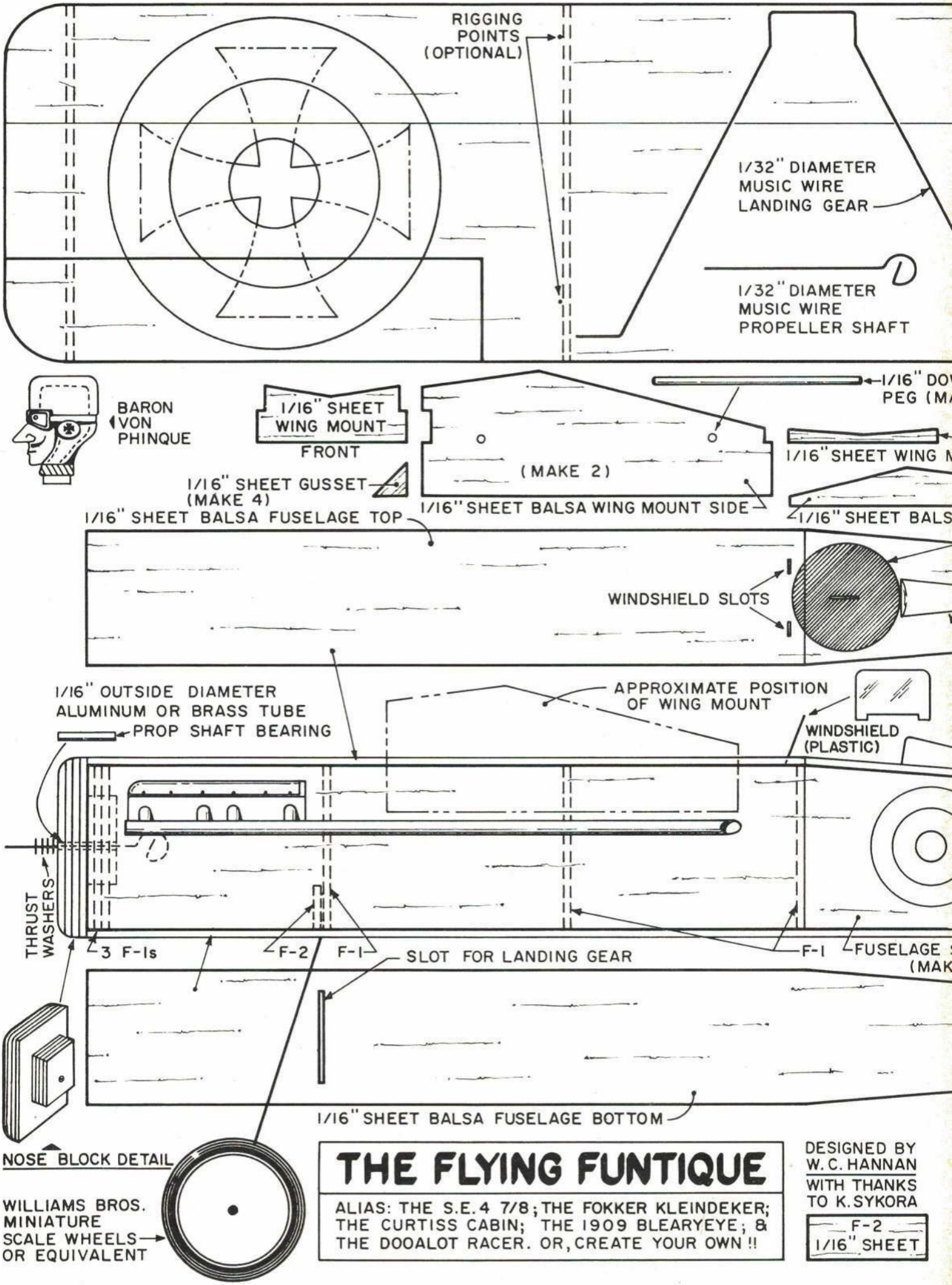
With fuselage bottom kept flat, glue bulkheads to it. Keep them erect and aligned.



Install the landing-gear wire and glue securely. Then add the top of the fuselage.



Two balsa sheets and three triangular ribs make up each wing panel. Note wing mount.



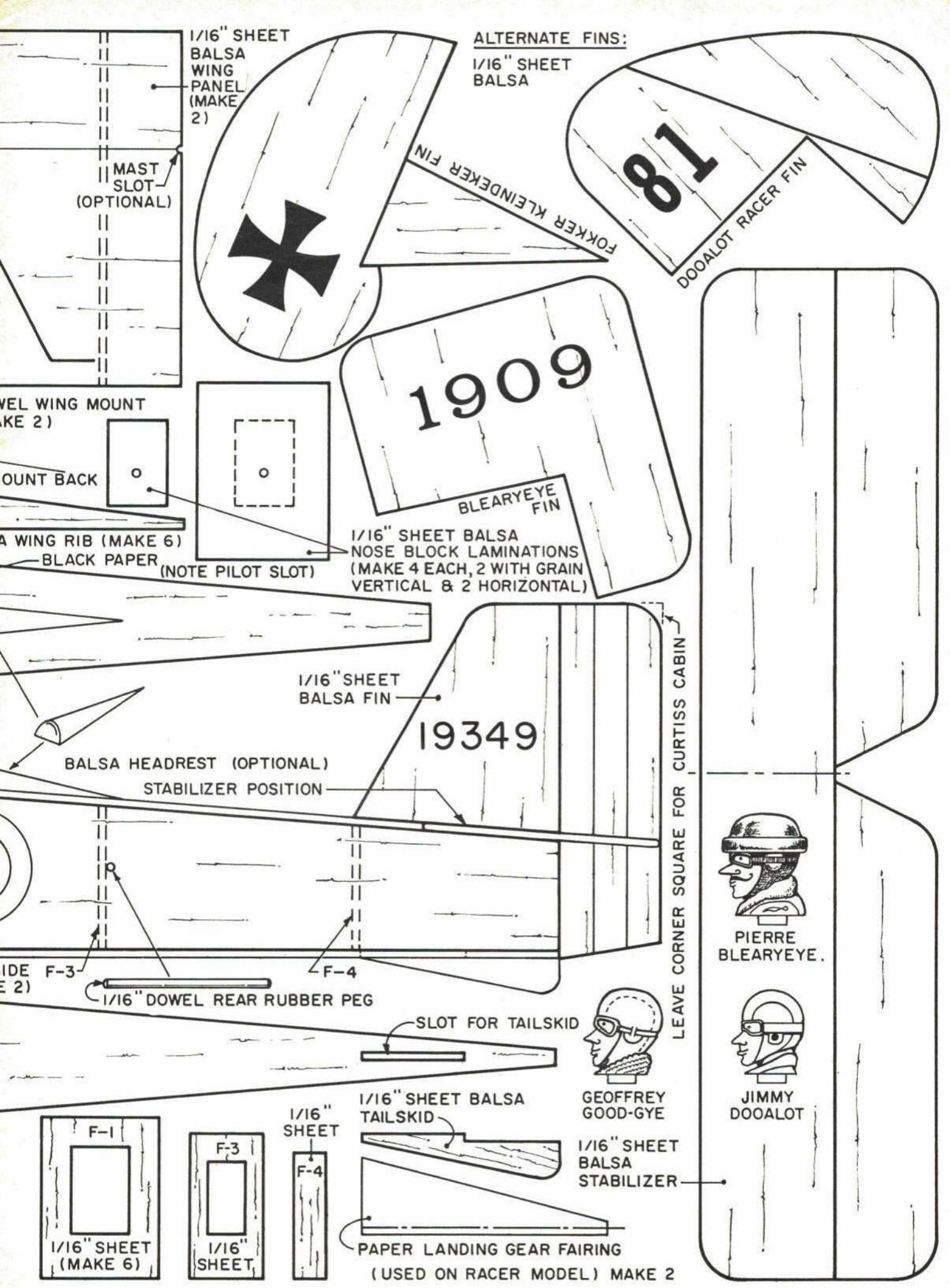
THE FLYING FUNTIQUE

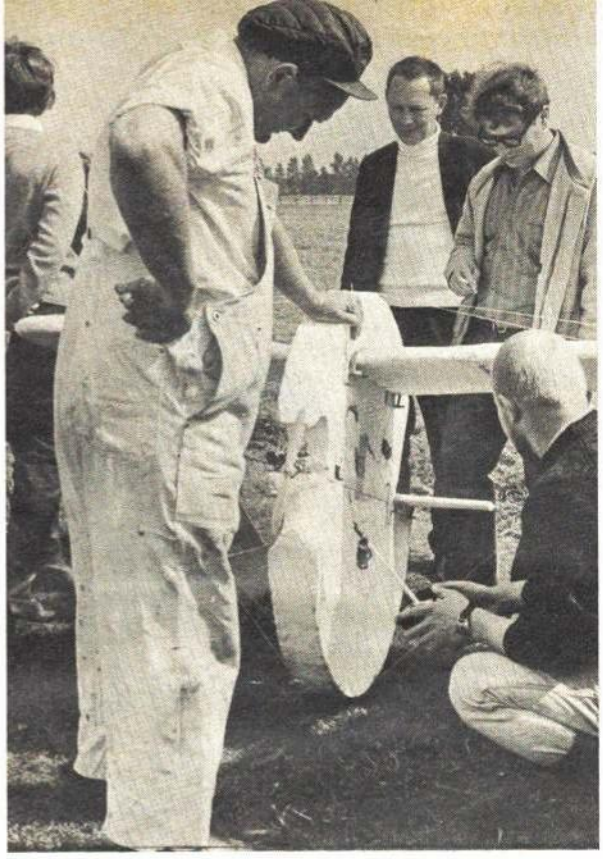
ALIAS: THE S.E.4 7/8; THE FOKKER KLEINDEKER; THE CURTISS CABIN; THE 1909 BLEARYEYE; & THE DOOALOT RACER. OR, CREATE YOUR OWN !!

DESIGNED BY W. C. HANNAN

WITH THANKS TO K. SYKORA

F-2
1/16" SHEET


1/16" SHEET BALSA WING PANEL (MAKE 2)
MAST SLOT (OPTIONAL)
ALTERNATE FINS:
1/16" SHEET BALSA
FOKKER KLEINDEKER FIN
81
DOOALOT RACER FIN
1909
BLEARYEYE FIN
WEL WING MOUNT
AKE 2)
OUNT BACK
A WING RIB (MAKE 6)
BLACK PAPER
(NOTE PILOT SLOT)
1/16" SHEET BALSA NOSE BLOCK LAMINATIONS (MAKE 4 EACH, 2 WITH GRAIN VERTICAL & 2 HORIZONTAL)
1/16" SHEET BALSA FIN
19349
BALSA HEADREST (OPTIONAL)
STABILIZER POSITION
LEAVE CORNER SQUARE FOR CURTISS CABIN
IDE F-3
E 2)
F-4
1/16" DOWEL REAR RUBBER PEG
SLOT FOR TAILSKID
PIERRE BLEARYEYE.
GEOFFREY GOOD-GYE
JIMMY DOOALOT
1/16" SHEET BALSA TAILSKID
1/16" SHEET BALSA STABILIZER
F-1
1/16" SHEET (MAKE 6)
F-3
1/16" SHEET
1/16" SHEET
F-4
PAPER LANDING GEAR FAIRING
(USED ON RACER MODEL) MAKE 2



Saucer — no visible means of support

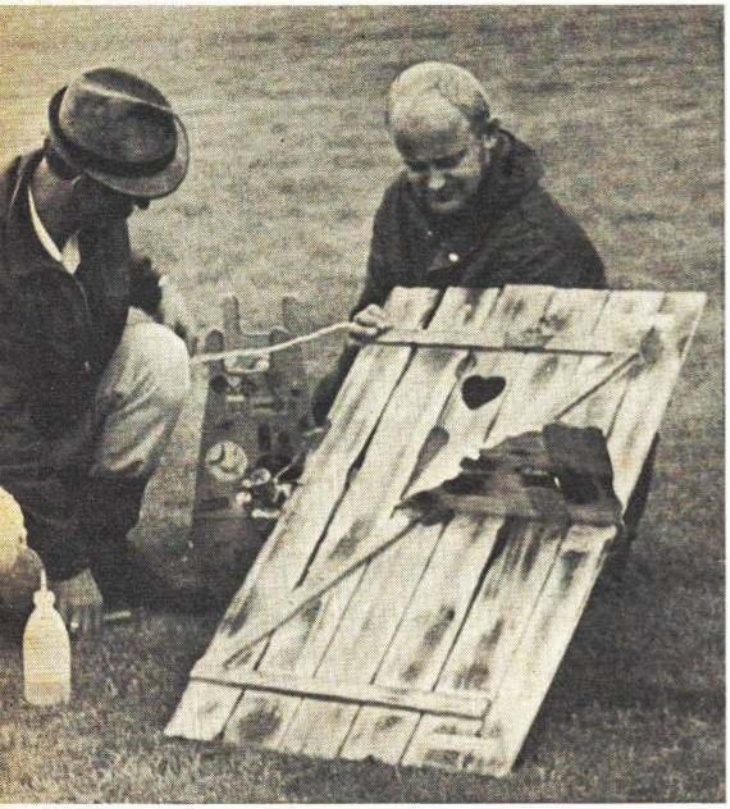
This flying saucer stands on edge to fly. It is an all-styrofoam 60-powered winged disc. Controls are just rudder, elevator, and motor using Simprop radio system. It was made by rasping, carving, and sanding blocks of foam; no finish or covering used. Landing this contraption is weird. It skips, hops, then rolls off into oblivion.

model world
. . . on the international scene

Is modeling in such a rut that a contest based on wild ideas is the coming thing? In Germany there was a recent R/C helicopter event. Now we want to show you a successful "weirdo" contest — all in fun, of course. The photos came from German model magazine FLUG without caption data, so we have improvised accordingly. One may be tempted to say just anything will fly, but a look at each model shows all are aerodynamically sound.

Mud in your eye! The joy-crate barrels along

Wonder what Snoopy and his flying dog house would think of this in flight? An S.T. 60-powered beer barrel has full-house radio controls. Airfoil on barrel is symmetrical. Center-section is reflex lifting surface. Really shakes up the drinking crowd!



This is no flying barndoor!

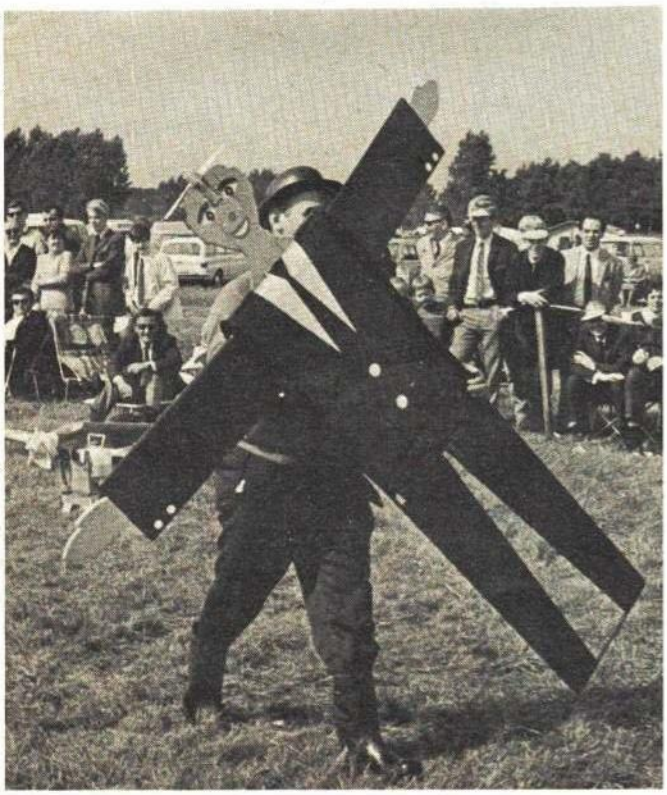
Now just a minute, where's the outhouse door? Flying? Incredible! Complete with heavy brass hinges, "clever" flat airfoil. It does fly, though not too stably. Rudder, elevator, engine control.

Ever seen a flying umbrella?

We think this powered umbrella is free-flight, stabilized by pendulum effect of the tail boom. Glide is like a parachute. Landing is easy — it poked into the ground and stuck there.

Superman — or Wizard of Oz?

While some of us consider our well-worn airplanes as scarecrows, this modeler seriously made one. Here the elevator control surface is located at the "hips." Should fly quite well.



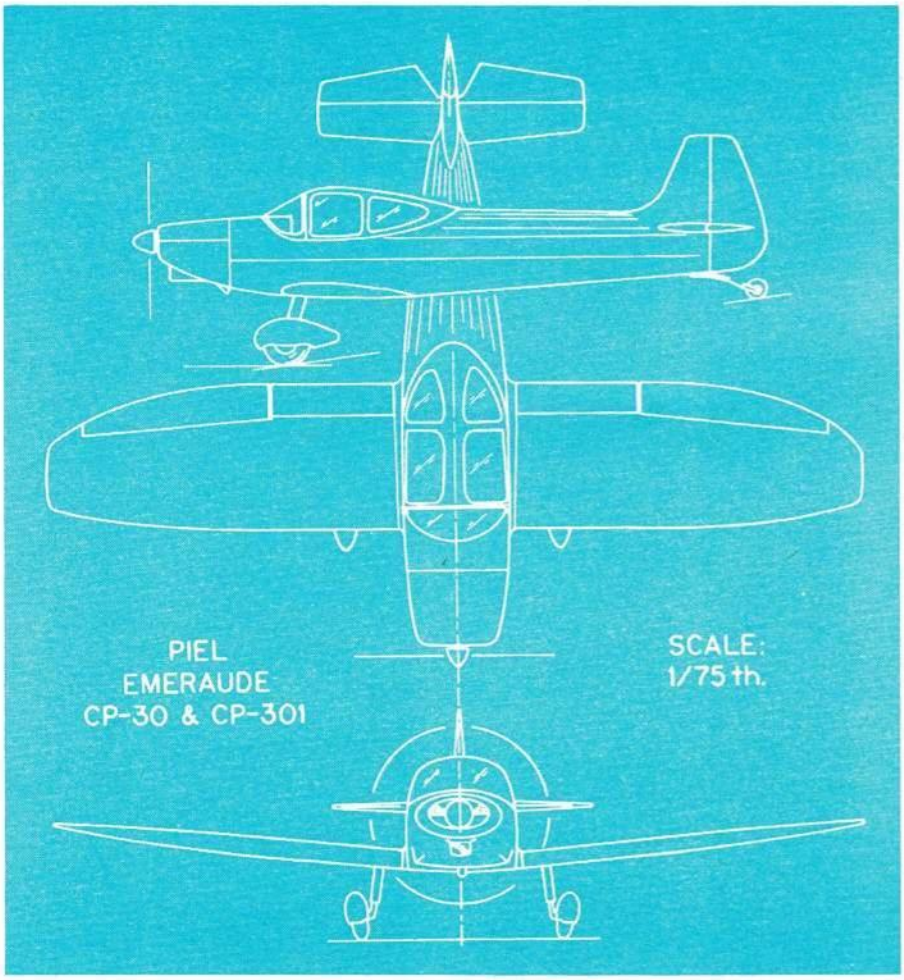
Self-pushing wheelbarrows

Here we find a real; honest-to-goodness wheel-barrow race. These things have rudder, motor, and elevator control. Note the "tail" wheel. Nothing impractical, it has been done before. Flies well.

The Emeraude

Popular French-designed home-built makes an ideal R/C ship capable of AMA pattern maneuvers, including snap-rolls and inverted spins.

BOB MORSE
as told to Leon "Duke" Crow



THE May, 1964, issue of Experimental Aircraft Association's *Sport Aviation* magazine carried an article describing the Emeraude, designed by Claude Piel of France and built by Wayne Barton of Rush, N. Y.

After seeing the photos of this beautiful home-built aircraft, we had to duplicate Mr. Barton's marvelous ship for R/C. We obtained from Falconair Aircraft Co. of Edmonton, Alberta, Canada, a descriptive brochure and three-view drawings.

The Emeraude is quite an airplane, having a wing span of 26 ft. 4 in., length of 21 ft., and a wing area of only 117 sq. ft. It can tote two adults at a maximum speed of 112 mph, or cruise at 103 mph on only 65 hp. Increasing the power to 105 hp jumps the cruise speed to 120 mph and maximum speed increases to 137 mph.

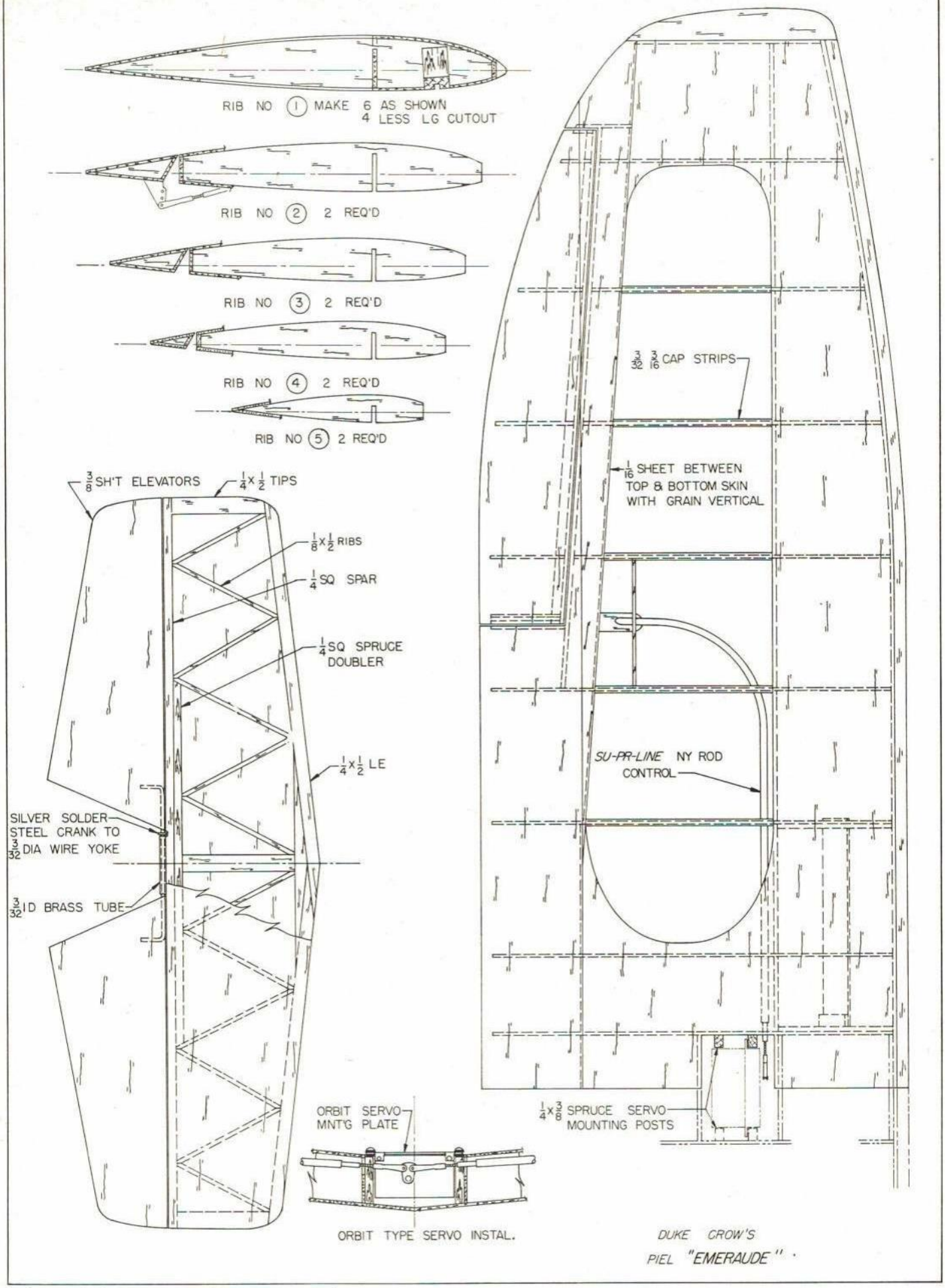
The cost of building a ship at home can be difficult to nail down. Mr. Barton managed to build his Emeraude, using all new materials except for instruments, wheels and a majored engine, for only $1,223. This is really a lot of airplane for the money! We plan, someday, to begin construction of our own Emeraude, but until then, we will have to enjoy our model.

Since building the ship in 1964, we have enjoyed many many flights. It is an excellent flyer, very stable and will perform the complete '68 AMA pattern (including snap-rolls and inverted spins) maneuvers. And you wouldn't believe the ground handling; takeoffs and landing have to be seen to be believed with these old-fashioned bicycle landing gears.

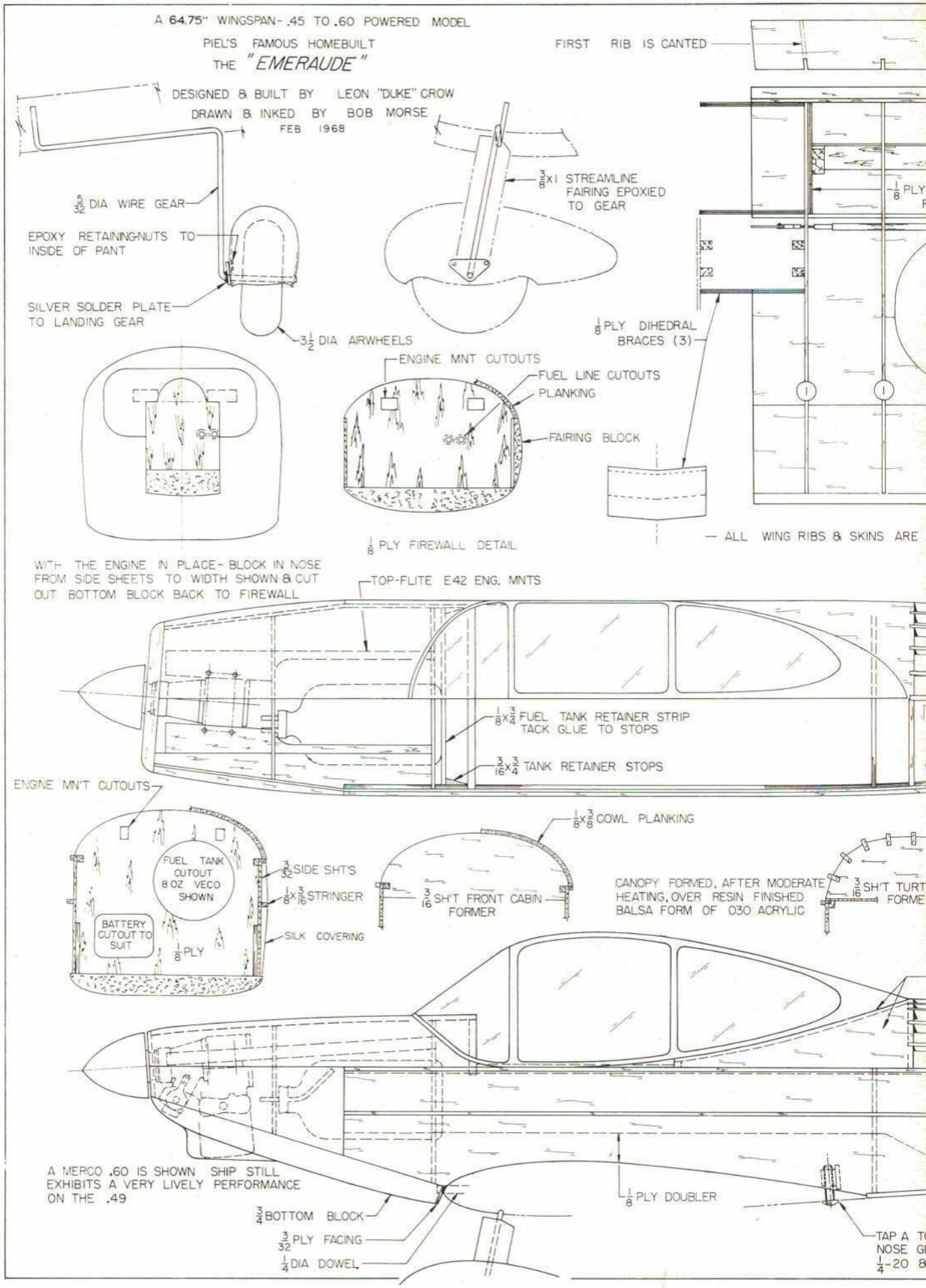
Wings: Construction is straight-forward and should present no problems. While the wing appears difficult to build because of its elliptical shape, it is, in reality, a straight wing with only the outboard portion, incorporating the ailerons, being elliptical. We chose the full-depth spar with interlocking ribs as the most practical method of obtaining the elliptical wing shape and to provide the correct spar profile in the outboard section of the wing.

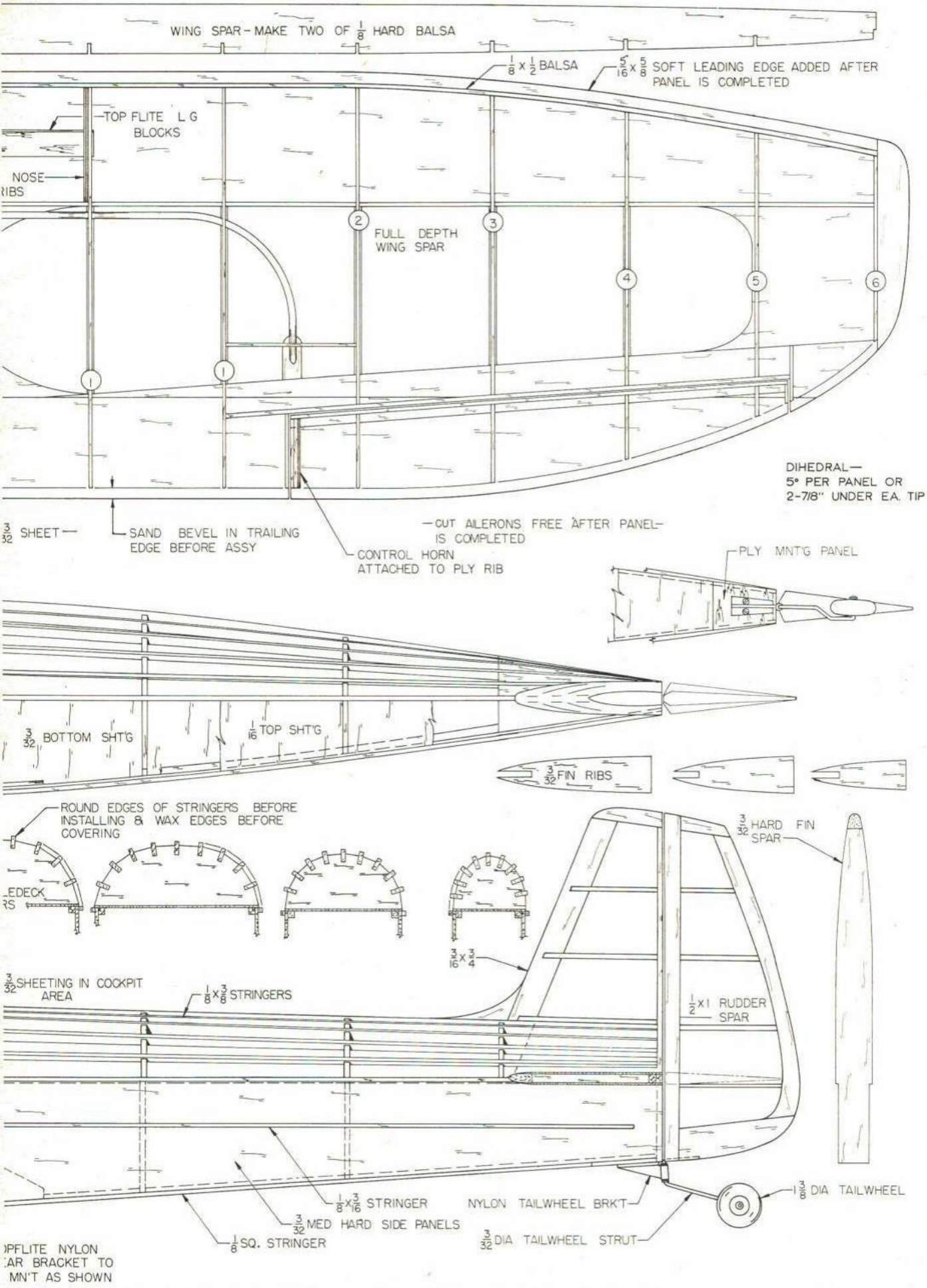
Begin construction of the wing by pinning the inboard trailing edge sheet to the flat building board. The main spar with

Continued on page 24

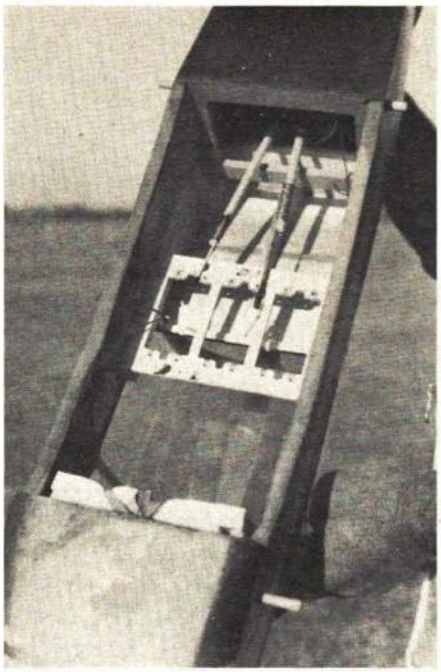


FULL SIZE PLANS AVAILABLE — SEE PAGE 60


A 64.75" WINGSPAN - .45 TO .60 POWERED MODEL
PIEL'S FAMOUS HOMEBUILT
THE "EMERAUDE"
DESIGNED & BUILT BY LEON "DUKE" CROW
DRAWN & INKED BY BOB MORSE
FEB 1968
FIRST RIB IS CANTED
5/32 DIA WIRE GEAR
EPOXY RETAINING NUTS TO INSIDE OF PANT
SILVER SOLDER PLATE TO LANDING GEAR
3 1/2 DIA AIRWHEELS
3/8 X 1 STREAMLINE FAIRING EPOXIED TO GEAR
1/8 PLY DIHEDRAL BRACES (3)
ENGINE MNT CUTOUTS
FUEL LINE CUTOUTS
PLANKING
FAIRING BLOCK
1/8 PLY FIREWALL DETAIL
— ALL WING RIBS & SKINS ARE
WITH THE ENGINE IN PLACE - BLOCK IN NOSE FROM SIDE SHEETS TO WIDTH SHOWN & CUT OUT BOTTOM BLOCK BACK TO FIREWALL
TOP-FLITE E42 ENG. MNTS
1/8 X 3/4 FUEL TANK RETAINER STRIP TACK GLUE TO STOPS
3/16 X 3/4 TANK RETAINER STOPS
ENGINE MN'T CUTOUTS
FUEL TANK CUTOUT 8 OZ VECO SHOWN
BATTERY CUTOUT TO SUIT
1/8 PLY
3/32 SIDE SHT'S
1/8 X 3/16 STRINGER
SILK COVERING
1/8 X 3/8 COWL PLANKING
3/16 SH'T FRONT CABIN FORMER
CANOPY FORMED, AFTER MODERATE HEATING, OVER RESIN FINISHED BALSA FORM OF .030 ACRYLIC
3/16 SH'T TURT
FORME
A MERCO .60 IS SHOWN SHIP STILL EXHIBITS A VERY LIVELY PERFORMANCE ON THE .49
3/4 BOTTOM BLOCK
3/32 PLY FACING
1/4 DIA DOWEL
1/8 PLY DOUBLER
TAP A T
NOSE G
1/4-20 8



FULL SIZE PLANS AVAILABLE — SEE PAGE 60



Looking through wing opening and out the canopy from the inside. There's plenty of room for three large servos side-by-side.

the ribs keyed loosely in place is then placed on 3/8" square spacer blocks (you'll see the reason for this when you pin the ribs down to the bottom trailing edge sheet). With the loose assembly in place, key the outboard ribs in place and then position the aileron spar so that all ribs are in line. With this spar pinned and blocked in place, the ribs can be disassembled and reassembled with glue. After the glue has taken its permanent set, the leading edge, nose sheeting and trailing edge sheeting can be installed. Add the rib capstrips and, when the assembly has cured, lift the panel and add the landing gear blocks, lower nose sheeting, and lower cap strips.

Repeat this for the opposite panel and you are ready for wing joining. Sand the skin sheeting at the roots to the dihedral angle shown and butt glue the two panels together. Take all the time you need at this point and make absolutely sure that the two panels are perfectly mated. If you do this right, you will have a wonderful flyer. Do it wrong and you'll have a dog! Assuming you have done it right and your glue has set, paint a 2"-wide strip of resin around the center-section joint, press a strip of glass cloth into the resin, and finish off your basic wing structure with a final coat of resin over the cloth.

The ailerons are built now and can be either built-up as shown, or hogged out of soft 3/4 sheet stock.

Inverted engine easiest to start. Don't prime into cylinder; just wet side of piston with fuel just before flipping prop.

Conventional torsion-bar landing gear used. Wheel pants from Stafford Chipmunk kit with strut faired by balsa and silk wrapping.

The real plane also is an exciting aircraft. Clean lines give fast cruise performance. Large wing area permits slow easy landing. Model's airfoil also permits aerobatics.

Fuselage: It is rather straight-forward and should present no problems. Start by making two complete side assemblies; don't forget, one righthand and one lefthand. These consist of the 3/32 side sheets, the ply wing opening doubler, the vertical 1/8 x 3/8 stiffeners and the stringers. After these have been finished, gently crack the 3/32 sheet at the forward edge of the ply doubler as shown in the top view; this will make things a little easier later on. Assemble the fuselage upside down on the building board with the front hanging over the edge of the board so that the firewall and the fuel-tank bulkhead can be installed. Add the gusset blocks and engine mount beams, then add 1/8 x 3/8 cross pieces at the uprights and top of sides, then the 3/32 bottom sheeting.

Pick up the fuselage now and complete the rounded, stringered top. To get straight stringers, pre-notch only the aft cabin former and install the other three turtledeck formers without the notches. Position each stringer as shown and mark the position on the rest of the formers, then cut in the notches and install each stringer as you go along.

Miscellaneous: As the model is built to 1/5 the size of the real ship, there is room for almost any type of radio gear. If you would like to operate the wing flaps, there is plenty of room for the control installation.

There are two pretty hard nuts to crack in building this bird, and we will tackle the tough one first. The cockpit canopy resembles a rather small birdbath! There are two ways of getting a canopy on your ship: 1) carve a hard balsa pattern 1/16 in. undersize from the drawing contours and finish it glass-smooth with Hobbypoxy, or a similar hard coat, and then heat 1/8" Acrylic or Polyvinyl sheet to a pliable state and quickly press over pattern.

The second problem is wheel pants. We did it the hard way — made molds and laid up our own with resin and cloth. Our next ship will have Jack Staffords' fiberglass Chipmunk or the Williams Bros. plastic parts.

As far as power is concerned, the ship is an excellent performer with a 45 mill up front, but for competition flying, a 60-size engine will really put those rolls "on a wire." Our ship is silk covered and finished in butyrate color in the same scheme as Mr. Barton's N9441H.

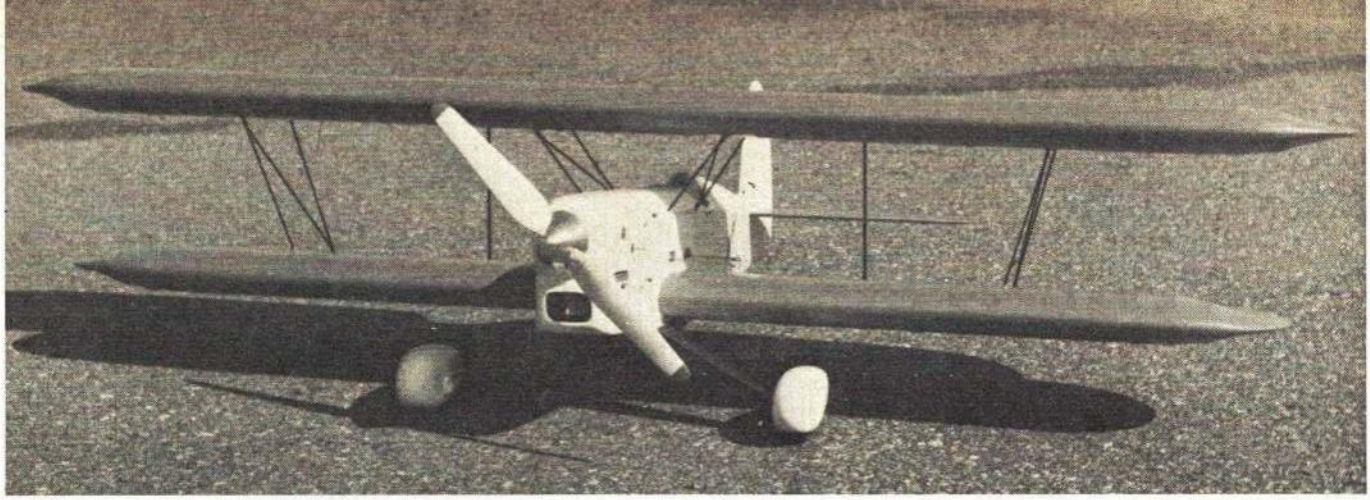
Every construction article we've read has cautioned the new builder to check things out before you go down to your favorite 5,000-ft. runway. We're no exception. Almost is not good enough. It's got to be right. Check out your control system. Recommended ground range, control linkages free, vibration checks with engine running, and so on. If anything doesn't look quite right, fix it now, or you won't have anything to fix later.

Flying: An experienced flyer will have no trouble with the Emeraude. One word of caution to our hot-dog tricycle-geared pilots, take it easy on the throttle on take-offs. Ease her up to about half throttle and watch the tail lift off. When she's got some speed and the controls become effective, you can firewall the throttle and really go!

We have flown the trike-geared ships for a long time now, but two-wheel lift off and touchdowns of a bicycle gear really give you a thrill.

For the new R/C flyer, Emeraude is a gentle, forgiving ship, and with an experienced flyer as a copilot, she makes an excellent trainer.

If you would like to get into the scale competitions, here's your chance to grab a few points with a relatively easy-to-build dependable flyer.



BICEPS

A muscular, big-engine bipe for sport and exhibition control-line flying.

DONALD YEAROUT

NEARLY every airplane nut has a soft spot for biplanes. There is something nostalgic about a two-winger, the whistle of wind through rigging wires and all that stuff.

When our local model club began control-line exhibition flying to stimulate public interest and recruit new club members, I became enthusiastic about a bipe for that type of flying. It would be an attention-grabber, an extremely stuntable and flashy aircraft. The ship I had in mind would be large; a small plane just doesn't get attention. The further I studied the biplane configuration, the more intriguing it became.

It appeared that the built-in head-wind high-drag characteristic to biplanes might be used to advantage. A large engine to turn a big low-pitch prop would give a very high static thrust. In combination with the high-lift high-drag layout this would result in a relatively slow-flying, extremely maneuverable craft — like a helicopter with its rotor facing forward! And that's the way it turned out.

A few additional design features improved preformance, such as: thick, blunt airfoil sections with full-span flaps on both wings to help eliminate the wobbling or staggering at low speeds common to biplanes during tight turns. A large elevator surface proved effective at low speeds. A large rudder with quite a bit of turn-out kept the lines tight at all times, since centrifugal force is not much of a factor at low speeds. There you have it.

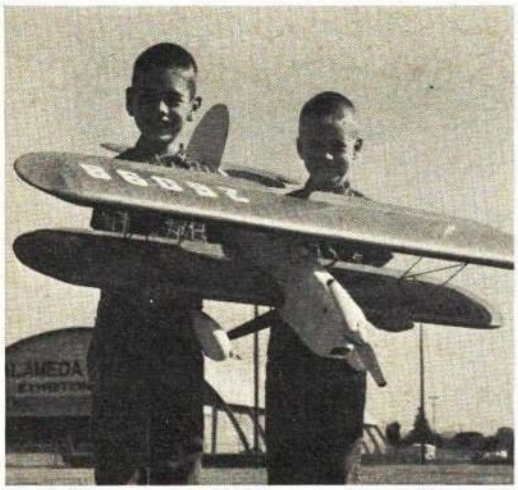
The theory sounded good, but the proof came in building and flying the brute. Biceps is a spectacular performer, a real ball to fly. Although not a smooth, precision, contest-type ship, it should give a good account of itself in any contest in the hands of a competent pilot. For exhibition-flying, Biceps is superb, the hit of any show. It is not particularly difficult to build. Large size and straight lines contribute to simplicity. It does take a considerable amount of balsa.

Tail surfaces: Both the fin-rudder and the stabilizer-elevator assemblies are made from medium-weight sheet balsa; wood grain parallel to hinge lines. First glue balsa sheets together edgewise to obtain enough width for entire piece to be cut from. Then shape to a streamline section similar to that shown on the plan. I have found that sanding boards (sandpaper of various grits glued to a flat piece of 1 x 2″ pine about 8 or 10″ long) make excellent tools for rough-shaping balsa wood before final sanding, prior to painting and finishing.

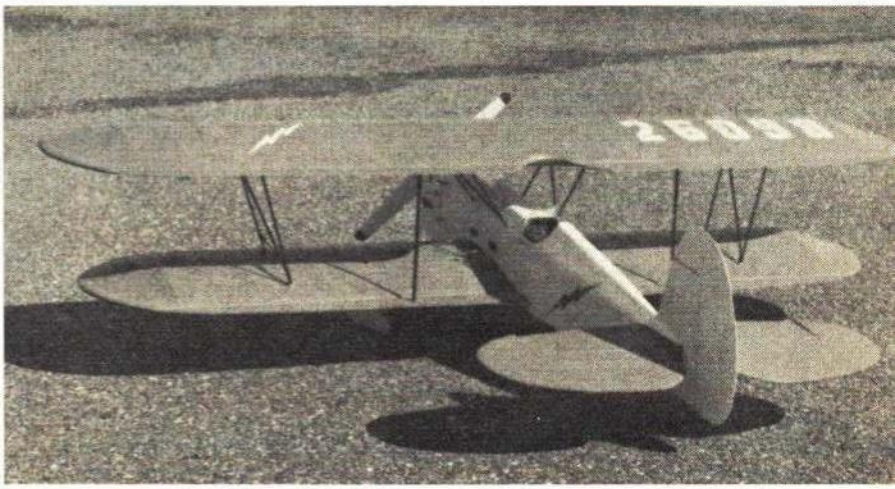
After rough-shaping, thoroughly sand with progressively finer sandpaper until you are satisfied with the job. Then seal the wood grain with a couple of coats of clear dope. I use and recommend Aero Glass products. They cost a little more but the quality is worth it. A couple of coats of filler should be applied next, again lightly sanding between coats. Now cut the rudder and elevator apart from their respective assemblies and sand the cut edges, rounding them slightly and follow by doping to seal the wood grain.

Now glue the rudder to the fin with 1″

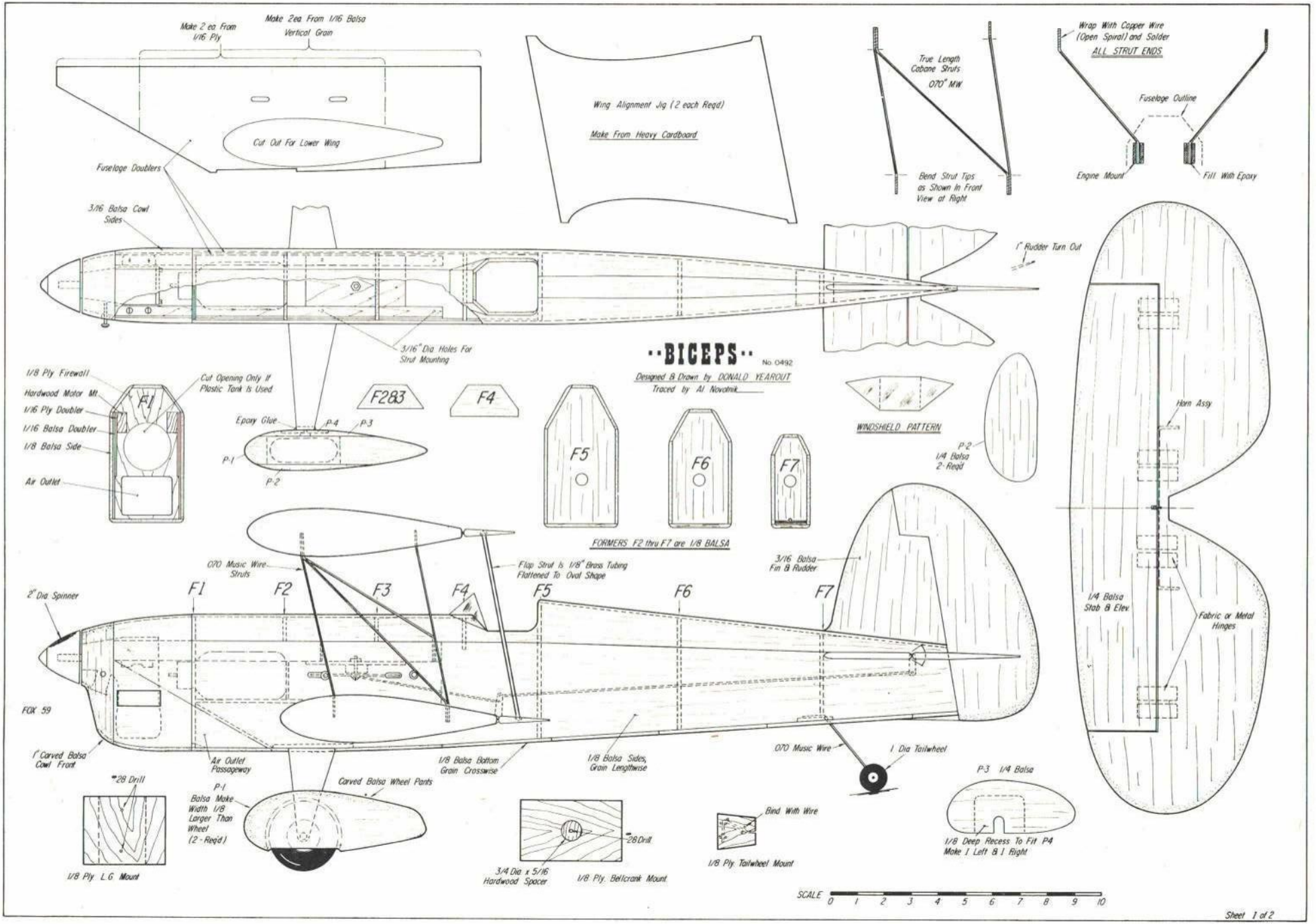
Continued on page 69

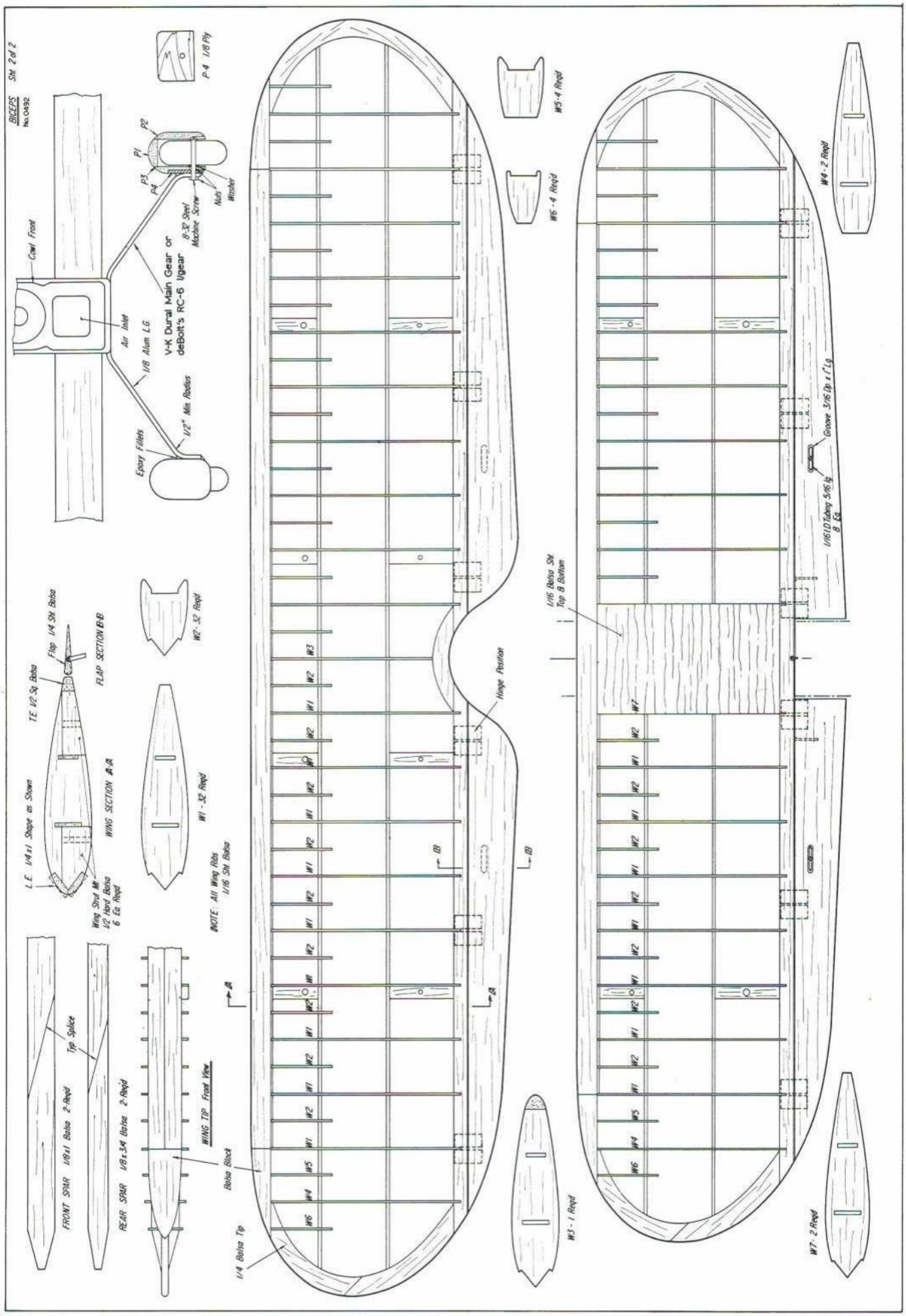


High-lift, high-drag, with big prop, make the bipe fly like a 'copter with rotor facing forward.



Oodles and gobs of wing area, thick airfoils and full-span flaps add up to a precision in flight that must be seen to be believed. You'll look good!


Make 2 ea. From 1/16 Ply
Make 2ea From 1/16 Balsa Vertical Grain
Cut Out For Lower Wing
Fuselage Doublers
Wing Alignment Jig (2 each Reqd)
Make From Heavy Cardboard
True Length Cabane Struts .070" MW
Bend Strut Tips as Shown In Front View at Right
Wrap With Copper Wire (Open Spiral) and Solder
ALL STRUT ENDS
Fuselage Outline
Engine Mount
Fill With Epoxy
3/16 Balsa Cowl Sides
1" Rudder Turn Out
3/16" Dia. Holes For Strut Mounting
"BICEPS" No. 0492
Designed & Drawn by DONALD YEAROUT
Traced by Al Novotnik
1/8 Ply Firewall
Hardwood Motor Mt.
1/16 Ply Doubler
1/16 Balsa Doubler
1/8 Balsa Side
Air Outlet
Cut Opening Only If Plastic Tank Is Used
F1
F2&3
F4
F5
F6
F7
Epoxy Glue
P-1
P-2
P-3
P-4
WINDSHIELD PATTERN
P-2 1/4 Balsa 2-Reqd
Horn Assy
FORMERS F2 thru F7 are 1/8 BALSA
.070 Music Wire Struts
Flap Strut is 1/8" Brass Tubing Flattened To Oval Shape
3/16 Balsa Fin & Rudder
2" Dia. Spinner
1/4 Balsa Stab & Elev.
Fabric or Metal Hinges
FOX 59
1" Carved Balsa Cowl Front
Air Outlet Passageway
1/8 Balsa Bottom Grain Crosswise
1/8 Balsa Sides, Grain Lengthwise
.070 Music Wire
1 Dia. Tailwheel
P-3 1/4 Balsa
1/8 Deep Recess To Fit P4
Make 1 Left & 1 Right
#28 Drill
P-1 Balsa Make Width 1/8 Larger Than Wheel (2-Reqd.)
Carved Balsa Wheel Pants
1/8 Ply L.G. Mount
3/4 Dia. x 5/16 Hardwood Spacer
#28 Drill
1/8 Ply. Bellcrank Mount
Bind With Wire
1/8 Ply Tailwheel Mount
SCALE 0 1 2 3 4 5 6 7 8 9 10
Sheet 1 of 2

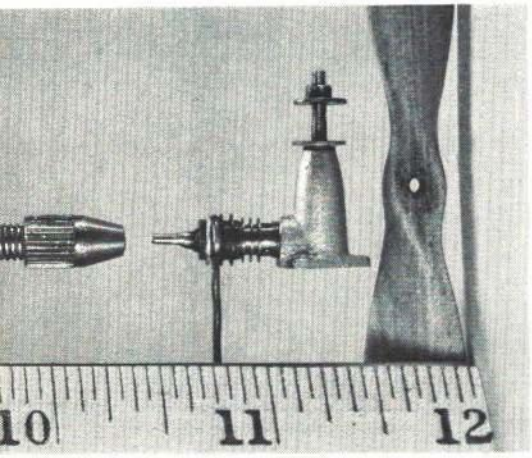


FULL SIZE PLANS AVAILABLE — SEE PAGE 60

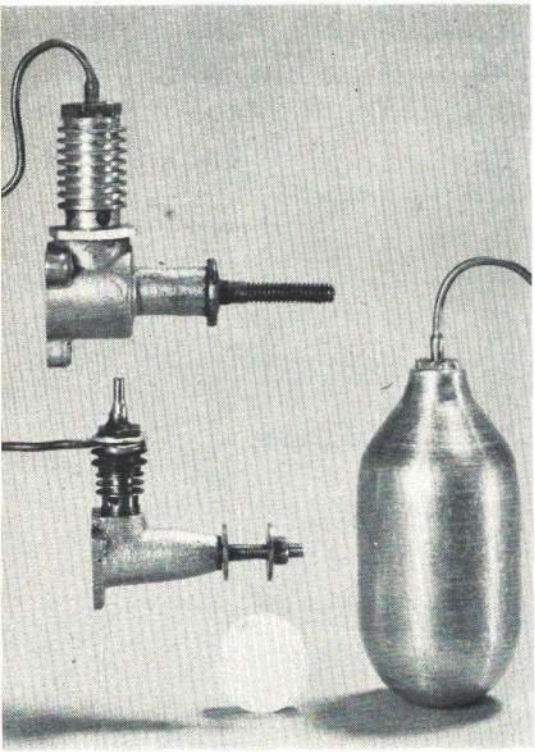
CO_2 Power is Coming Back

Return of once popular CO_2 flying brings improved and lighter engines and all-new compressed-gas jet—here used on the Micro-Jet Delta.

HOWARD MC ENTEE AND BILL BROWN JR.



This is an old 005 engine modified by McEntee for convenient top-of-cylinder refilling. New engine not yet in production.



Larger engine, an 018 Herkimer OK, is shown with the 005 mill and its light-weight aluminum supply tank. Note aspirin tablet!

OLD-TIMERS who remember the late 1940's will recall the interest in CO2-powered (CO2 in this article means carbon dioxide) model planes, for sport flying and competition (there was at least one AMA class). These remarkable powerplants were developed by Bill Brown Jr., already famed for the development of the Brown Junior gas engine (that's *gas*, not glow!) which revolutionized model aviation, and brought on the continuing development of tiny model glow engines which have reached such perfection today.

Never one to rest on his laurels, Bill then dabbled with CO2 power. In the post-war 1940's he perfected three sizes of these engines. One was a rather large job (relative to his others), which turned an 8″ prop with lots of power. It used an entire Sparklet CO2 cartridge for each flight. These cartridges were used then, as they are now, for specially equipped bottles that turned plain tap water into "soda water" for drink-mixing. This engine had a displacement of .018 cu. in. Really interested in much smaller units, Bill sold all rights to the big engine to Herkimer Tool & Model Works, who marketed the engine under their "OK" label as late as the early '60's.

Next came Bill's favorite — the tiny A-100. The complete powerplant, less prop, weighed about ¼ oz. A low-pitch 4″-dia. prop was recommended. It flew planes ranging from 1-2 feet span, which weighed about 1½ oz. maximum. It was flown very successfully in tiny all-balsa scale planes of 12″ or so. The displacement was only .0015 cu. in.! The final engine in the series was the "B," with a displacement of .005 cu. in. and total plant weight (including tank but less prop) of about .65 oz., for planes up to 30″ span. Production on both of the smaller engines ceased around 1950.

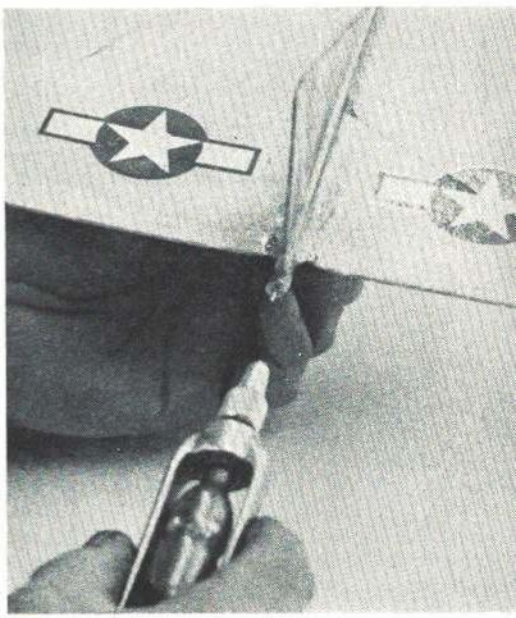
Those of us who were active with CO2 had a high regard for Bill Brown's developments, but we (and Bill, too) freely conceded that some detail improvements were needed. Tank filling was a bit unhandy. You screwed the cartridge holder into a valve in the tank, a simple but fussy operation. The A-100 crankshaft bearings wore rapidly. Some of us put in brass bushings — but this thinned the crankcase nose so that it broke easily. Basically, the plants worked fine, and the incentive for improvement came when the late Jim Walker became interested in them.

With such backing, Brown developed a much simpler, faster and more convenient filling system. The tank is fueled through a tiny nipple on the engine cylinder head. Crankshaft bearings were greatly improved and the case beefed up considerably. A much better valve material was found for the engine. CO2 gas is admitted to the cylinder through a tiny ball valve. Great things were looked for with the improved design but Jim's death brought a halt to CO2 progress.

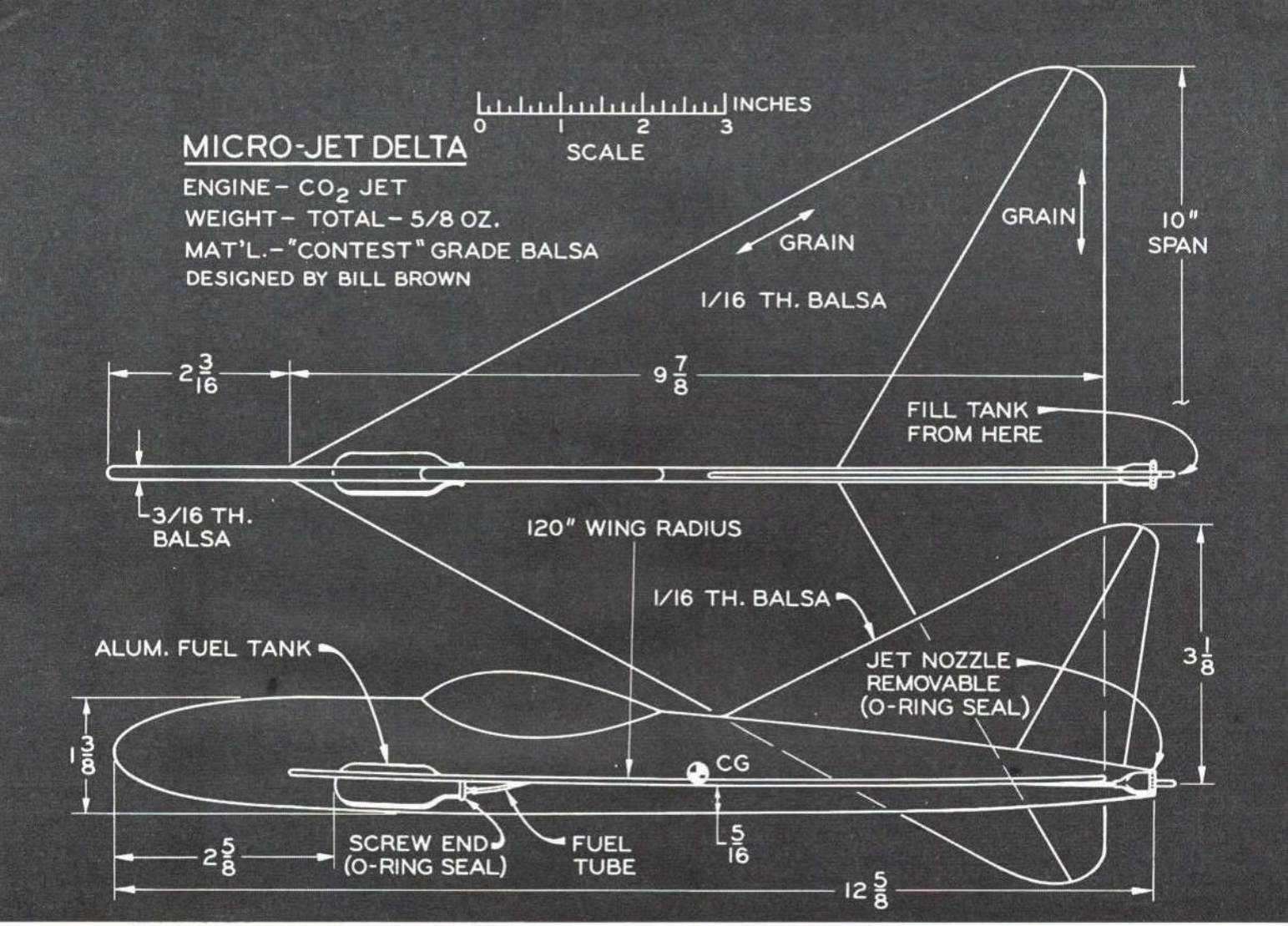
Over the years, Bill Brown Jr. has run his machine-tool business in central Pennsylvania for a living — but continued to dream of marketing better CO2 powerplants. We're happy to report that such marketing may not be too far off. Bill has refined designs for three engines, with .001, .005 and .02 cu. in. displacement.

There is also a tiny jet engine. Due to its relative simplicity, it doubtless will be marketed first. However, all components of this plant will be worked into the piston powerplants to come later. We show herewith a little delta profile jet plane Bill has been flying. Thrust doesn't last long—about 5 seconds (replaceable nozzles with different-sized orifices will be offered for varying thrust)—but the plane gets high enough for a fine glide.

Brown has chosen the middle-sized .005 engine as his first piston job of the new series to be marketed, but its difference from the old "B" is amazing. About the



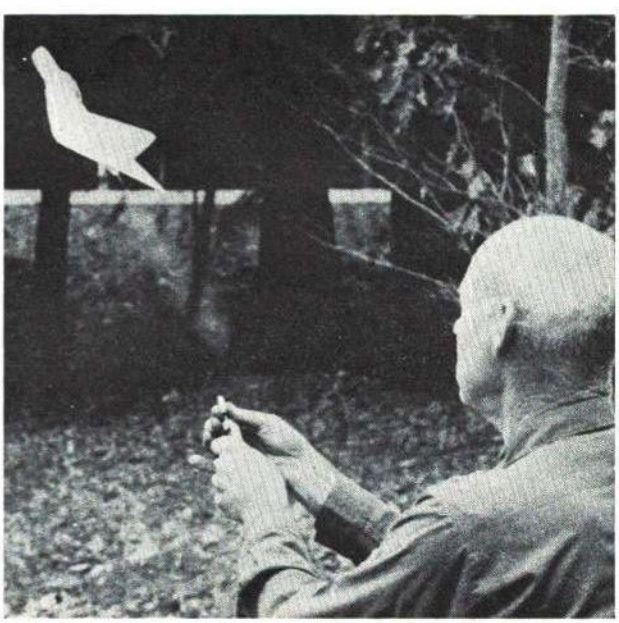
Jet is easily filled through outlet nozzle using CO2 cartridge and holder — which has pressure fitting. This fitting also is the launch-release device. Thrust nozzle adjustable for power output and duration. Delta is exciting fun job. Jet can be mounted in dime-store, 29c gliders.



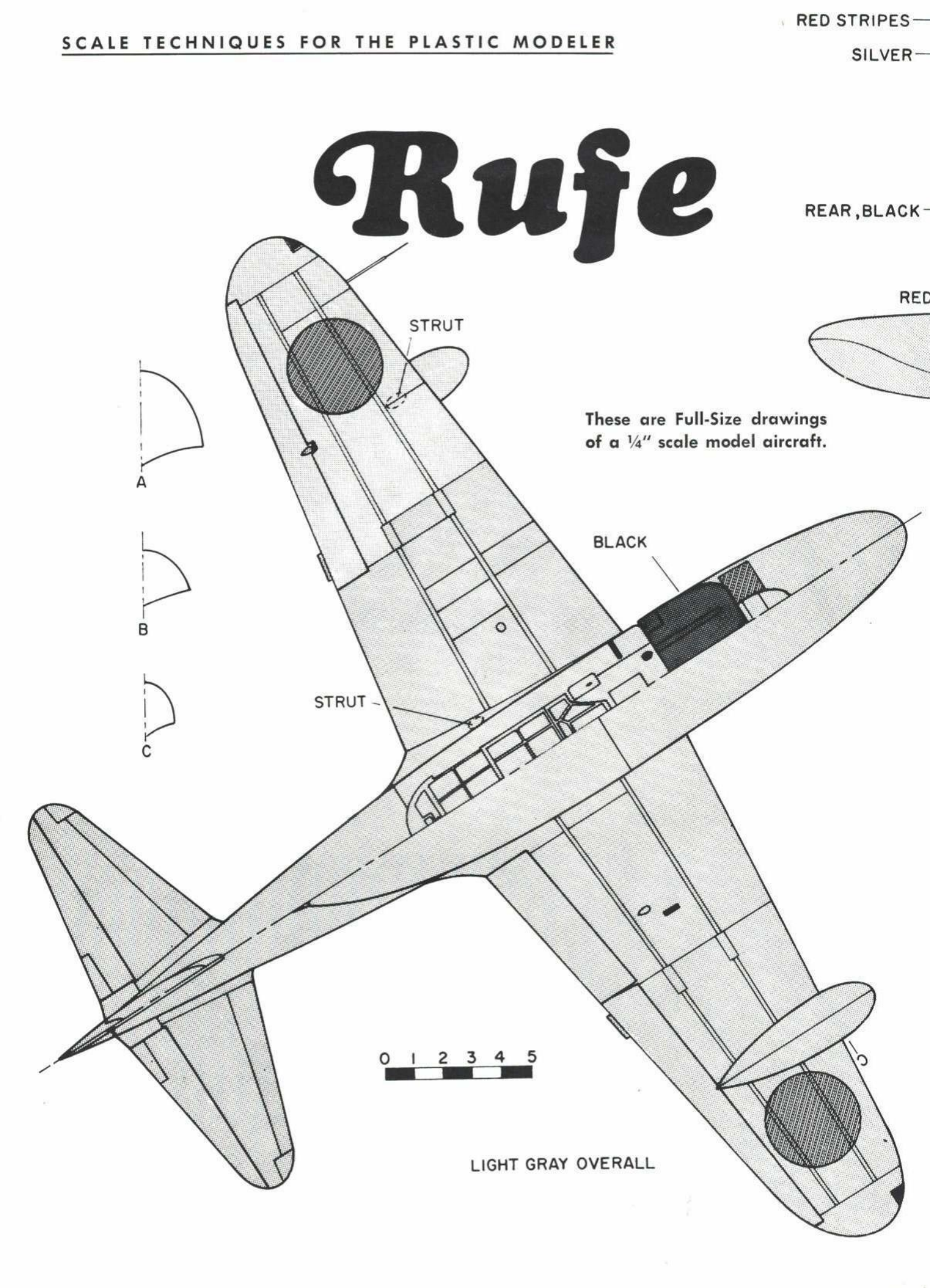
only similarity is the .005 cu. in. displacement. The plant will weigh little more than the old A-100, and the engine itself isn't much bigger than the A-100 engine (which was only about ⅞" from top to bottom). This engine will be marketed with the same tank used for the jet engine (larger or smaller tanks may be used, however). The jet engine itself (with proper nozzle to act as a filler valve) may be employed to "gas up" the piston plant, if you want to bury the engine in an inaccessible spot — inside a scale plane cowling, for example.

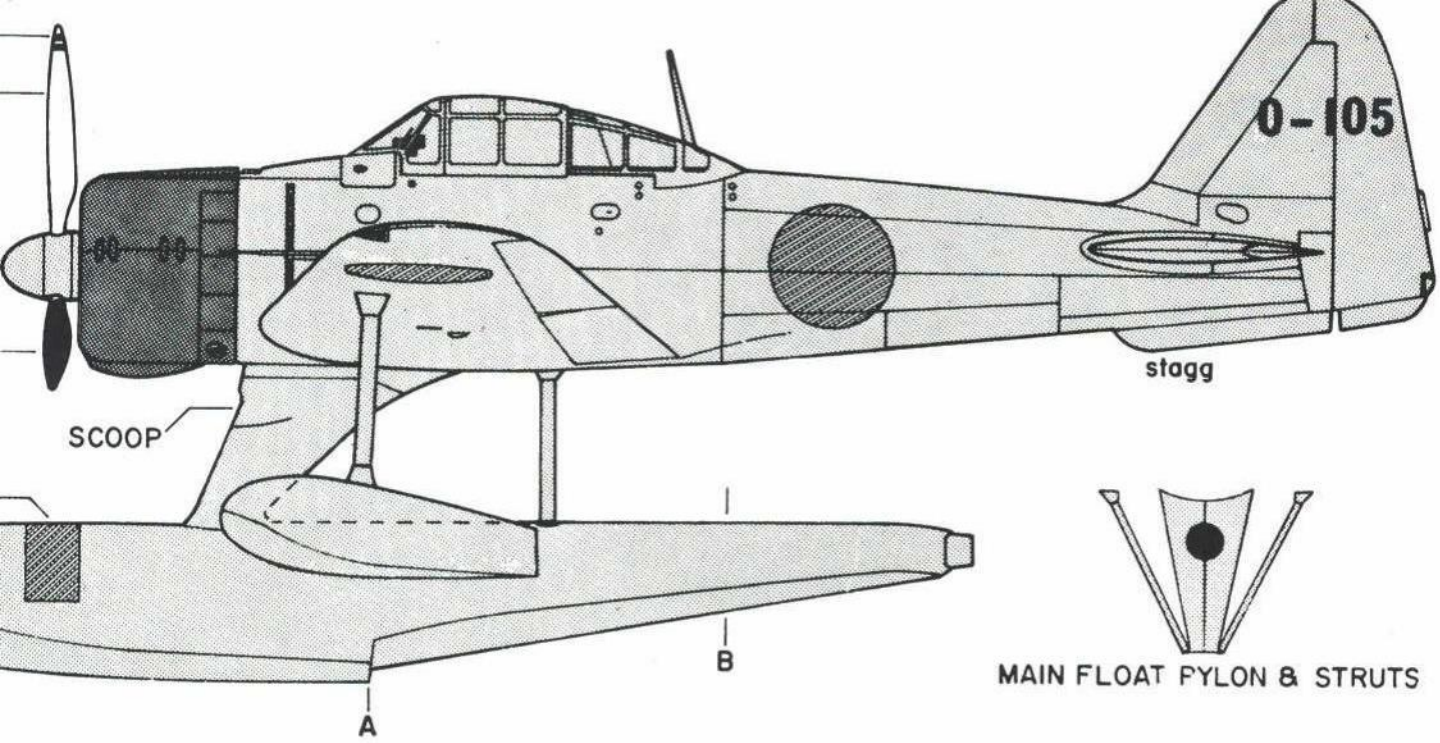
While the .005 and .02 engines offer ample power to fly outdoor F/F models of all types, the .001 job sounds ideal for the tiniest indoor designs! All the engines can be adjusted easily for thrust. Thus, the .005 should do fine indoors. Furthermore, with the very tiny and light gear we have today — it sounds like a natural for indoor R/C flying. Just think of the possibilities: No smoke, no smell, very little noise, no fire hazard, instant starting every time, low fuel cost (we used to get up to six flights from a single Sparklet cartridge). Larger cartridges that are refillable reduce even this cost, allow many dozens of flights before

Continued on page 73



Rufe


RED STRIPES
SILVER
REAR, BLACK
RED
STRUT
These are Full-Size drawings of a ¼" scale model aircraft.
A
B
C
BLACK
STRUT
0 1 2 3 4 5
LIGHT GRAY OVERALL



MAIN FLOAT PYLON & STRUTS

Adding floats to a 'Zero' puts a Japanese Navy O-2 fighter in your collection.

JOHN N. TOWNSLEY

THE "Rufe" was a Japanese Navy O-2 fighter of Mitsubishi design, similar to the "Zeke" land-fighter Model 2-1, with identical airframe and wings, but mounted on a large single float with wing tip floats added. The floats reduced the speed of the floatplane to 50 mph less than the land version.

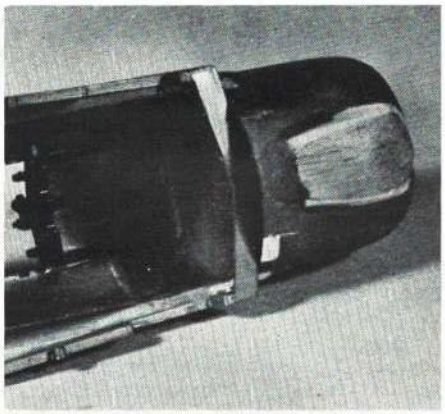
Rufe operated both in the Northern Pacific and Solomons area during World War II. For a time the Rufe was the fastest floatplane in service. Designed for regions in which land-fighters had difficulty operating, the Rufe was the principal type of airplane used to defend Japanese positions in the Aleutian Islands in 1942. Many of them were based on Kiska.

Specifications: Japanese designation: A6M2-N; Model 1-1. Designing company: Mitsubishi Heavy Industries, Ltd.; assembled by Nakajima Aircraft Co., Ltd. Layout: single-float, low-wing cantilever monoplane. Construction: Stressed-skin metal with fabric-covered control surfaces. Crew: one. Motor: one 14-cylinder Nakajima "Sakae" (Prosperity) Model 12 air-cooled radial, capable of 955 hp at 14,500 ft. Span: 39′ 5″; length: 34′ 6″; loaded weight: 5,920 lbs.; maximum speed: 278 mph at 16,000 ft.; maximum range (with maximum fuel load): 1,280 miles; service ceiling: 35,400 ft.; climb: 2,090 ft./min. at 14,000 ft.; fuel: 227 gallons. Armament: Two 20-mm. cannon and two 7.7-mm. M.G. (fixed forward firing). Bomb load: small bombs carried under wings (optional).

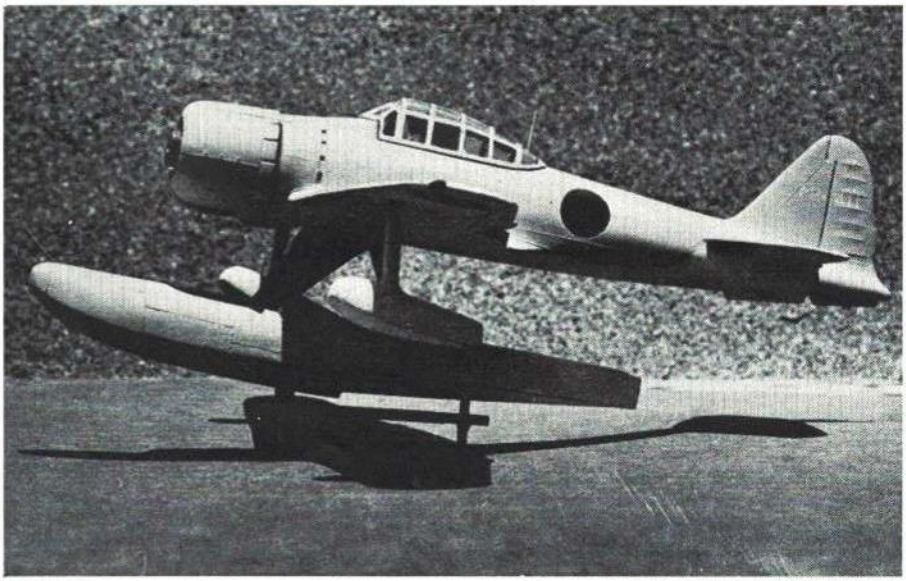
Unusual models can be built by utilizing the conversion technique on standard plastic kits. I will give general background and conversion processes used in changing a standard Japanese Zero kit to a Navy 2 fighter, the Rufe. There are plastic Zero kits on the market by both Monogram and Lindberg. The kit used for the model shown in a Monogram Zero kit: #PA 73-98. To build the Rufe from a standard Zero kit requires about five additional hours of time.

Some of the color schemes for the Rufe are as follows: 1) Gray-blue on all surfaces. 2) Dark Navy blue on upper surface and

Continued on page 60



Almost completed model displays aircraft's direct relationship to the Zero fighter.



Before fitting the wing, gun positions on the cowl are relocated, air scoop changed.

RADIO CONTROL WORLD

A ROUNDUP OF LATEST NEWS

CONDUCTED BY HOWARD MC ENTEE

This SE-5A was built for the enjoyment of Dr. Gordon Gallagher's sons. It spans 14′, weighs 90 lbs., is true scale. Has a 3-hp Briggs & Stratton engine, but not flyable.

Grassroots

Save that plane: Item in "Breeze," paper of the Whirlwinds (Benton Harbor-St. Joseph, Mich.) intrigued us. Club member Mike Gaishin was a relative novice, and to save a lot of building and repair work he fitted a parachute on his plane. Whenever Mike got into flying trouble or when ready to land, he popped this 7′ dia. chute, to waft the plane gently earthward. It prevented broken props, cracked wings, even bent landing gear. Plane was a low-winger, chute apparently fastened to bottom of fuselage, and the plane was suspended more or less nose down from the chute cords.

Man-sized toy plane: R/Cers often speak of their craft as "toys." Look at the toy Dr. Gordon Gallagher built for his kids! Construction was brought about when his wife suggested perhaps Gordon was spending too much time on planes, not enough with his family. He quickly took up the suggestion of producing a model plane the children could have fun "in." The wifely idea was doubtless on the lines of a small pedal car with stub wings poking out here and there. Those who know Gordon (he's a fine craftsman, specializes in BIG R/C scale biplanes, mostly old-timers) should not be surprised at the results depicted herewith! Plans of an SE-5A taken from a magazine were blown up without changing proportions, by using a homemade ruler that would enlarge ⅛″ on the mag plans to 3″ for the new toy. The cockpit came out large enough for the kids to get into (yes — Gordon *tried* to get in!).

After 1½ years work, he emerged with a 14′ span beauty. Longerons are ¾″ pine, formers ¼″ ply, wing spars are 1″ sq. pine and ribs are ⅛″ ply. Radiator shutters were made from tongue depressor blades (it figgers!). Landing gear shock-absorbing system is exactly like on the real plane. Wheels are 1¾ x 16″ bike-type with inner tubes. Respoked by Gordon, they were the most expensive part of the project. They have discs of flashing aluminum.

The engine is an all-aluminum 3-hp Briggs & Stratton, turning a prop made of 1″ thick pine. Covering is very thin Dacron. It was put on as smooth and tight as possible, then shrunk with a flatiron. No dope was used for the finish. Water-base latex house paint worked surprisingly well. Interplane wiring is stranded picture-hanging wire — cheap and easy to handle.

The plane weighs about 90 lbs. As for performance, Gordon admits the thing is so hard to transport that it has been taken to a field where it could be taxied only twice. On pavement it taxies much too fast to be safe for kids, and the steerable tail wheel loses most of its effectiveness. The prop spins at a very high speed — much too dangerous for kids to play with! Gor-

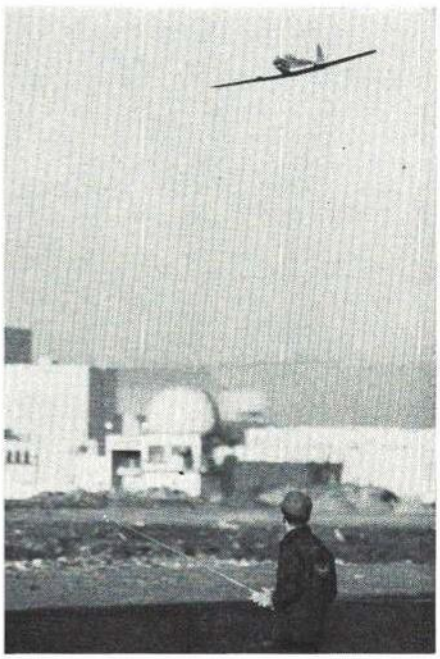
An editorial — *'When a beginner asks your advice – and one probably will sooner or later – don't just brush him off.'*

WHAT do you tell the beginner? We are often approached these days with the query, "I'm new to R/C and would like suggestions on what equipment I should buy." We've discussed this with experienced R/Cers, and the answers run all the way from, "Tell 'em to get the lowest cost stuff possible to see if they like R/C!," to "Full house propo right at the start is the only way to go." To the latter is usually added, "They'll want it eventually anyhow." True. But how many wives are gullible enough to believe it when hubby carts in the shining new multi propo rig and says innocently that "I got a good buy — just a bit over $50 for this whole outfit"?

Between these statements there must be a happy medium. If you know the budding R/Cer, it helps him a lot. But most of them are strangers. We try to find out if they have been active hobbyists before. If so, what hobby and how long were they involved? If they are "hobby jumpers" who flit from one to another without getting really involved, it seems useless to suggest an expensive multi outfit. Are they adept with tools? If so, perhaps building a kit transmitter and receiver would be enjoyable. It could save considerable money too; few newcomers care not how much the stuff costs. For the special few, advice isn't needed — they'll buy what strikes their fancy anyhow.

How can you honestly answer, "Which equipment is the best?" Few of us have extensive experience with all current equipment. But every local area has its favorites — usually because one good flyer had good luck with one make and everyone tagged along. Generally, we feel these "area favorites" are the best makes to suggest, other things being equal. A beginner is apt to need rather frequent repairs; does this make have a good rep for fast service? Is there a repair representative reasonably nearby, or will the equipment have to be shipped all the way across the country?

We have a couple of invariable rules, though. First, we strongly discourage purchase of super-regen receivers. In some areas with little activity, and little CB and other interference, they might be a "best buy." But we live in a metropolitan area — every flying spot has dozens of modelers await-



Hobby shop owner Jim Sunday flies this deBolt Cobra in the new Formula II 40-powered pylon racing event. Like the original plane, the model is complete with retracting landing gear. This really simulates full-scale realism. It is very fast.

don says while it looks pretty set up — it's a very impractical toy. Imagine all that work — and it can't be flown!

Three-views for scale modelers: Not knowing what size he wanted to make some scale-up three-views of a P-39, Dick Sarpolus (32 Alameda Ct., Shrewsbury, N. J. 07701) had microfilm negs made. These measure about 1¼ x 1¾", and Dick mounted them in stiff cards. They can now be put in a slide projector and enlarged to any desired size on a large sheet of paper, upon which he can trace the needed details. The negs can be made at most drafting supply or graphic arts stores.

Competition

1969 R/C World Championships: The tentative date for this affair we had in recent issue has been confirmed—July 23-27. There will be two days for practice, three for officials. Four rounds will be run, the highest three scores of each contestant being counted. Two flight lines will be in use. Flying will be at the airfield of a German plane manufacturer. We understand security is rather tight there, and separate areas will be set up for "supporters," and for the general public. Only the teams and officials will be allowed on the flight line. As an added attraction, hostesses from Lufthansa will act as interpreters in any desired language, for teams that need such help.

In addition to the two flight lines for stunt competition, there will be a third line for Scale. While Scale is not an official event in 1969, it will be flown in all other respects on an equal status with Aerobatics. If all goes well, R/C Scale will be official after 1969. A special AMA Committee headed by Bill Northrop is selecting a representative Scale team to fly for the U.S.A. Since regular AMA funds can only be used to defray expenses for U. S. teams in official World Championship events, a special fund has been set up to help finance expenses of the Scale team to Germany. Checks or Money Orders should be sent to the Academy, payable to "Academy of Model Aeronautics (R/C Scale)."

Huge R/C glider meet: What must have been the largest R/C glider meet ever held was run off at Kirchheim/Teck, West Germany, some 25 miles south of Stuttgart on Nov. 27, 1968. It was sponsored by the Graupner organization, well known for kits, servos and small model components. The meet was the latest in an annual series that has been going on for some years; 125 flyers actually put planes into the air, most of these having a flight in each of the four rounds. This made the astonishing total of 479 flights for the one-day meet.

Using superhets, the Germans can put up

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ing their turn. This is no place for 27 MHz regens! Few R/C beginners have ham licenses, or are about to get one just for R/C. And so far, our equipment makers haven't seen fit to extend the advantages of the 72-MHz band to the potential users of single-channel equipment.

Second, we strongly discourage use of escapements. Sure, they are light, low in cost, compact. But a beginner has plenty of problems without having to remember to wind the rubber every few flights, or to fight the ravages of vibration that will make his equipment worse than useless. Another rule — not so invariable — is to suggest the beginner start out with nickel-cad cells. Yup — they cost more than dry cells and he'll need a charger too. But the advantages obviously are great.

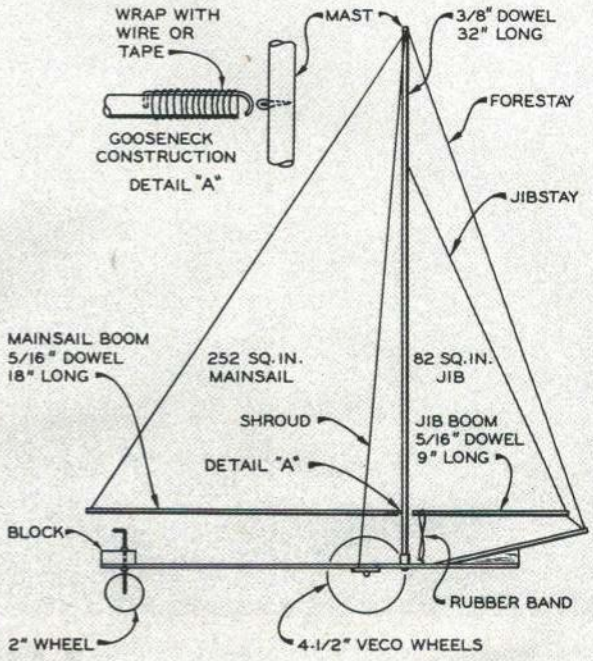
A simple ready-to-use single-channel outfit with transmitter, receiver (regen) and single-channel sequence servo costs around $50, less batts. An escapement only would reduce the cost a couple of dollars. But for $30 more, the buyer could have a simple pulse-propo transmitter, a superhet receiver and a magnetic actuator — again no batts. With this ready-to-fly rig, he would be getting "stick training" for his probable entry into more complex propo — if he stuck with R/C long enough. If not — his investment wasn't too steep — and he could sell out at a fair price. Have you tried to sell an escapement outfit recently? In our area you can't give them away!

A happy compromise is found in the dual-range pulse-propo transmitters, with a matching relayless double-ended receiver. Both units are flexible, can be used for a number of different pulse systems, from plain rudder-only up to separate servos for each control. They have good resale value — and probably for some time in the future.

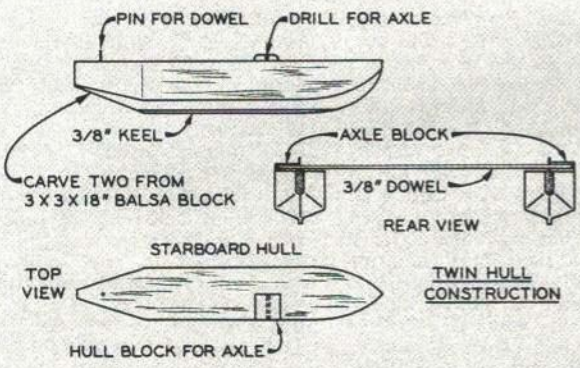
Kits save money, of course. They have an even bigger advantage — the builder learns something about how his rig works, can service it himself, and can probably do simple repairs. We do have a number of buy-and-fly boys today — often they are the "loaded" ones to whom cost is not an important factor — but most will agree that a reasonable knowledge of the equipment adds to enjoyment of the hobby, and can greatly reduce frustration.

Actually, the advice a beginner receives can be of vital importance to him — and to all of us. If he is successful and stays with R/C, we may have gained a most important and useful addition to our ranks; the hobby trade has gained another buyer (who'll help them continue to put out the goodies you and the rest of us depend upon). Who knows — maybe the guy owns a big farm in the nearby countryside, and could help solve the ever-present flying-field problems!

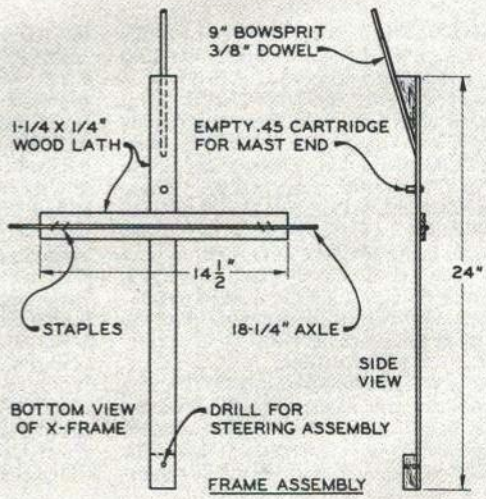
When a beginner asks *your* advice — and one probably will sooner or later — don't just brush him off. Have a good answer ready, or if you can't, introduce him to an experienced R/Cer who does!



RIGGING AND SPARS



TWIN HULL CONSTRUCTION



FRAME ASSEMBLY

To use your older, shelved control systems, try R. N. Muffly's sailing yacht. It goes on wheels, floats, skates, and skis. He uses a 6-channel reed outfit but single-channel would work well too. Change the size or dimensions to suit. Fast, it needs smooth surface.

12 planes at once on the 27 MHz R/C band. This, plus the fact that no "ground maneuvers" are involved, must account for the huge number of flights. Furthermore, the Teck (where we've had the pleasure of flying gliders several times) offers the possibility of many launching areas and plenty of air space. We do not know what the events were, but believe that glider stunting was involved. The meet was won by Klaus Reh with 951 points, but the top ten placers were all within 50 points of each other.

Inter-club fly-ins: A most successful fun-fly was hosted by the Signal Chasers of St. Louis, with the Spirits of St. Louis club as guests. It was strictly informal throughout. Events were spur-of-the-moment, and judges were those who happened to be nearest at hand. Bob Underwood of the Chasers (4109 Concord Oaks Dr., St. Louis, Mo. 63128) who sent the info, stresses the fact that there was wide participation by both clubs. Some 50 members of both were present, most of whom flew at some time during the day. About 25 entered the various events.

Jay Helt (Spirits) won the Spin contest with 55 turns from his Kwik-Fli II. Entrants in this event got only two minutes from time the wheels left the ground. Travis McGinnins (Spirits) made 24 loops in his two minutes. This wasn't tops, but Trav did it with a Snipe glider sporting a pod-mounted 049 engine!

A Gliding event was won by Guy Oliver (Spirits) flying a heavy Taurus. Following a 67-sec. engine run, Guy kept his plane aloft for another five minutes, a time even the sailplanes couldn't beat. Simple scoring of this event gave one negative point for each second of engine run, and one positive point for each second of unpowered glide.

The host club tried several different ways of computing the scores, but finally had to acknowledge the Spirits were the better men. The Spirits will act as hosts this year, for both clubs feel the affair *must* be held annually.

Technical Matters

Upside-down float: Originator Tiny Harley calls our attention to the fact that the fuel float valve we described (drawing on p. 37, Jan. '69 issue) is inverted! He is certainly right!; as we show it, the unit would be completely unworkable. But rotate it 180 degrees and you're in business. The float must be down and the fuel inlet valve open with no fuel in the chamber. Incoming fuel raises the float and shuts the valve. The vent tube we show should be near the top of the chamber and the outlet to engine carb at the bottom.

Special for deltas: An advocate of tailless planes, Martin Dietrich (9690 S.W. Beaverton Hwy., Beaverton, Oreg. 97005) has had problems with the linkage in delta planes, where it's usual to utilize the same tail surfaces for elevators (moving up and down together) and for ailerons (moving oppositely). This can take some tricky linkage with many joints — and many places that can produce looseness or binding. He therefore decided to tackle the problem at the transmitter end of the system

His deltas now have a servo linked directly to each elevon — the simplest possible plane setup. The linkage we show moves two pot shafts together in the same direction for elevator action, but moves the pot

cases oppositely for ailerons. So that he could quickly convert the transmitter for use with conventional controls, Martin removed the wires from the transmitter elevator and aileron pots and inserted a set of connectors. Either the original pots in the transmitter, or the two new ones on the unit illustrated, may be hooked into the transmitter circuitry. Since there isn't room to put it inside, the new pot unit is attached mostly outboard on the left-hand side of his Kraft KP-6 transmitter.

Pushrods run to the regular elevator and aileron sticks (Martin apparently has the mode with aileron and elevator on opposite sticks). With the new unit in place, the normal pots work with the sticks as usual, but the connectors determine which pots are operative. A metal frame attached to the transmitter case carries the two pots, A. Pots are *not* bolted solidly to this frame, but are free to rotate in the nuts soldered to the frame. To get a snug fit here, solder was flowed in the nut threads lightly, then the pots turned through. Fine grinding paste was employed for a smooth running fit.

Each pot has a U-shaped wire B soldered to it, and the open wire ends engage piece C. This is of sheet phenolic, pivoted to the metal frame, per top view. The aileron pushrod is linked to C, has a clevis for adjustment. Note that, when you move the aileron pushrod right or left, the pots move oppositely. Items D and E are attached to the pot shafts, linked together, and to a pushrod to the elevator stick. Thus the resistance of the two pots can be varied together, oppositely, or in any combination of the two!

Martin inclined parts D and E on the shafts so that he gets more up elevator than down — generally known as differential. He's found he needs to launch a delta with up-elevator. Without the differential, loops tend to be very big, or they just can't be completed. The centering springs on the normal control sticks were found adequate to center the new mechanism too. One precaution: neither control stick must move the new pots more than 50 degrees of their total rotation — preferably less. Otherwise, you won't be able to obtain full movement for *both* elevator and aileron action at once, should you need it for stunting.

Toofer one: Here is a double-purpose vehicle that may be steered by some of that equipment you no longer use. It is fine for the kids to play with — if the old man will relinquish the controls! Basically, this is a sail-driven vehicle, to which you can fit either wheels or floats. The author didn't mention it, but it should go fine on ice or packed snow with the proper skates or skis. Dimensions may be altered to fit what you have available.

Builder R. N. Muffly (29 Wood Haven Circle, Ormond Beach, Fla. 32074) didn't call it "Four for One" and include skates and skis! He used wood lath for the cross frame, dowel for the bowsprit. Music-wire axles hold the wheels—big ones in front, a smaller one to steer. Dowel mast is stepped into an empty cartridge case for easy removal. A 45-lb. cotton fishing line holds it firmly in place.

R. N. says to make the sails with the threads parallel with the diagonal rear edge of the mainsail, and the vertical rear edge of the jib. A hem was sewn along all edges of each sail, and the mast, booms and stays inserted inside these hems. Min-X 6-channel reed gear controls the craft.

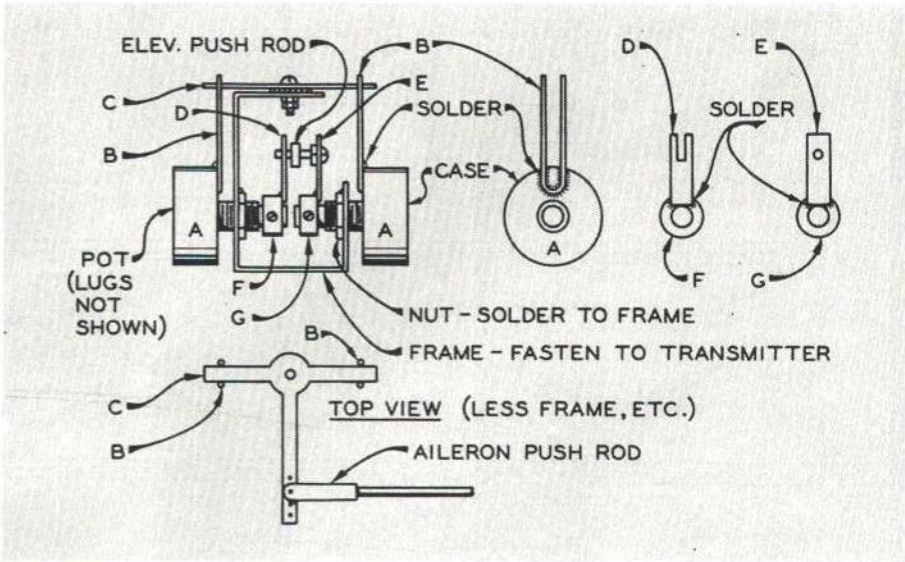
An MK servo was modified to full-trimmable by discarding the internal switching board and contacts; the two blue wires were soldered together, also the two orange wires, and the brown wire insulated. A

Continued on page 74

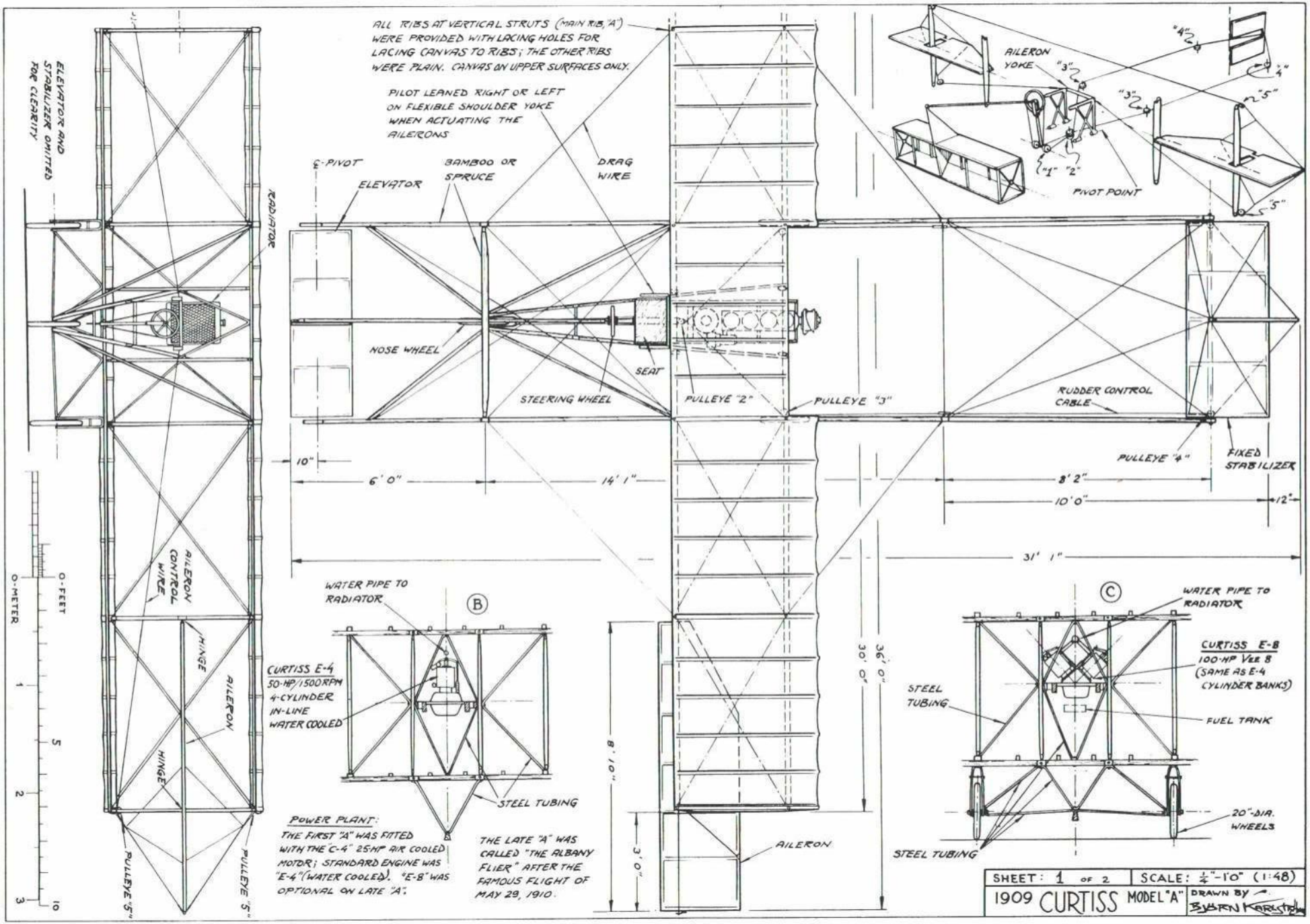
Bruce McLendon uses See-Saw Switcher on Testors system with Micro stick on transmitter.

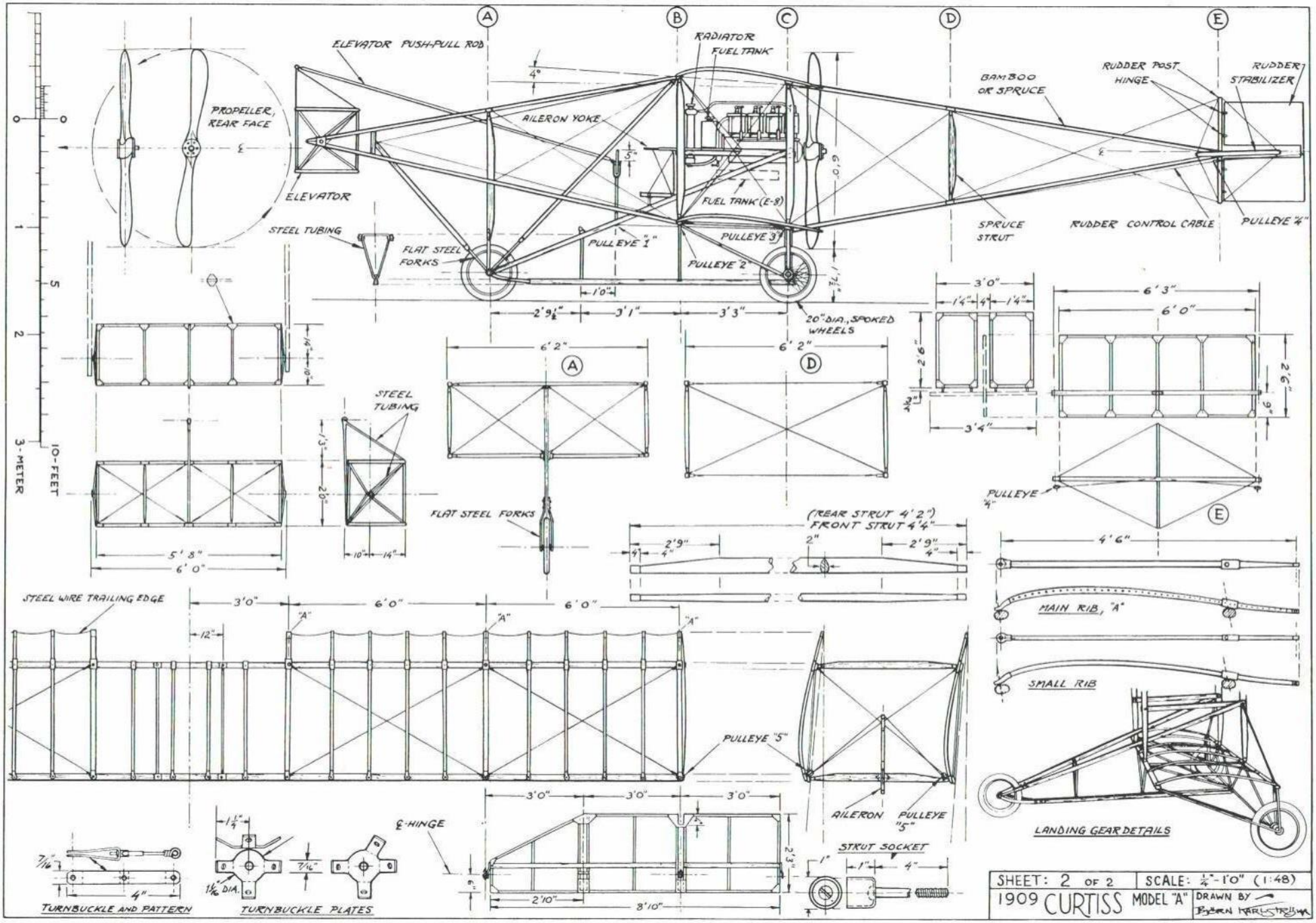
Jack Elem highly modified Midwest Lil' T glider for simple dihedral, increased tail areas, and shaplier fuselage. Speed and duration both increased.

Peter Rittmaster of Bertram Yacht Corp. holds scale version of his Master Moppie racer. It is sold by One Design Marine of N. J. for $700, complete with R/C and 3½-hp engine.



Delta-mode elevon controls at transmitter by M. Dietrich uses external-control-stick system. Two new pots connected to encoder give one-servo operation for each elevon.


ELEVATOR AND STABILIZER OMITTED FOR CLARITY
RADIATOR
AILERON CONTROL WIRE
HINGE
AILERON
HINGE
PULLEYE "5"
PULLEYE "5"
0-METER
0-FEET
ALL RIBS AT VERTICAL STRUTS (MAIN RIB, "A") WERE PROVIDED WITH LACING HOLES FOR LACING CANVAS TO RIBS; THE OTHER RIBS WERE PLAIN. CANVAS ON UPPER SURFACES ONLY.
PILOT LEANED RIGHT OR LEFT ON FLEXIBLE SHOULDER YOKE WHEN ACTUATING THE AILERONS
℄-PIVOT
ELEVATOR
BAMBOO OR SPRUCE
DRAG WIRE
NOSE WHEEL
SEAT
STEERING WHEEL
PULLEYE "2"
PULLEYE "3"
RUDDER CONTROL CABLE
PULLEYE "4"
FIXED STABILIZER
AILERON YOKE
"1" "2"
"3"
"3"
"4"
"4"
"5"
"5"
PIVOT POINT
10"
6'0"
14'1"
8'2"
10'0"
12"
31'1"
WATER PIPE TO RADIATOR
B
CURTISS E-4
50-HP/1500 RPM
4-CYLINDER
IN-LINE
WATER COOLED
STEEL TUBING
POWER PLANT:
THE FIRST "A" WAS FITTED WITH THE C-4" 25HP AIR COOLED MOTOR; STANDARD ENGINE WAS "E-4" (WATER COOLED). "E-8" WAS OPTIONAL ON LATE "A".
THE LATE "A" WAS CALLED "THE ALBANY FLIER" AFTER THE FAMOUS FLIGHT OF MAY 29, 1910.
8'10"
30'0"
36'0"
3'0"
AILERON
C
WATER PIPE TO RADIATOR
CURTISS E-8
100-HP VEE 8
(SAME AS E-4 CYLINDER BANKS)
STEEL TUBING
FUEL TANK
20"-DIA. WHEELS
STEEL TUBING
SHEET: 1 OF 2
SCALE: 1/4"-1'0" (1:48)
1909 CURTISS MODEL "A"
DRAWN BY BYRON KARLSTAD


ELEVATOR PUSH-PULL ROD
RADIATOR
FUEL TANK
BAMBOO OR SPRUCE
RUDDER POST HINGE
RUDDER STABILIZER
PROPELLER, REAR FACE
AILERON YOKE
ELEVATOR
FUEL TANK (E-8)
STEEL TUBING
FLAT STEEL FORKS
PULLEYE "1"
PULLEYE "2"
PULLEYE "3"
SPRUCE STRUT
RUDDER CONTROL CABLE
PULLEYE "4"
20" DIA., SPOKED WHEELS
10-METER
10-FEET
STEEL TUBING
FLAT STEEL FORKS
(REAR STRUT 4'2")
FRONT STRUT 4'4"
PULLEYE "4"
STEEL WIRE TRAILING EDGE
MAIN RIB, "A"
SMALL RIB
PULLEYE "5"
AILERON
PULLEYE "5"
LANDING GEAR DETAILS
TURNBUCKLE AND PATTERN
TURNBUCKLE PLATES
E-HINGE
STRUT SOCKET
SHEET: 2 OF 2
SCALE: 1/4"-1'0" (1:48)
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FOR THE NEW MINI PLANES

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!

ADAMS AR BABY ACTUATOR

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

VOGT THROTTLE RESTRICTORS

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
No. 16K173—Vogt Restrictor for .020..... 2.00

Supplement 69-2 will contain FIVE pages of how-to on the building of Profile Mini Planes by Chris Soenksen.

Supplements sent to all regular Ace R/C customers free.

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And there are more of them! From Fair-its and Edge-its to T pins; from 4 and 6 pin connectors to finest grade hookup wire in ten different color packs; from breakaway motor mounts, base materials, nylon bolts, wing mounts, servo mounts to almost any other accessory not available from other sources. These are More-Craft Goodies—Now produced at Higginsville.

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

NEW!

DICKERSON—TESTOR CONVERSION KITS

Although intended primarily to convert the Testor Skyhawk to GG operation for rudder an elevator (motor if desired), the kits below ar among the most versatile ever offered.

The plane conversion kit will give GG for the Skyhawk, but also may be adapted for airplane up to .19 power! May also be used with almos any other type of receiver—relay or relayless

RECEIVER CONVERSION KIT

The Dickerson conversion kit for the Skyhawk receiver utilizes some of the components a ready in the unit, but adds a switching decode to convert signals for a Rand LR3. Kit consist of PC board for housing switcher, LR3, switc and charging jack on a 2⅝ x 4¼" deck. Con tains all transistors and resistors. LR3, con nector, switch and charging jack are not sup plied.

No. 15K53—Dickerson Skyhawk Rx Conversio Kit, $11.50

TRANSMITTER CONVERSION KIT

While foregoing may be used with any GG trans mitter, this kit makes the conversion of th Testor Simpulse Tx into a two stick GG trans mitter easy and simple. Only hand tools re quired. Basic kit contains all pots, brackets extra stick assembly (SPST push switches fo motor available as extras.)

No. 11K5—Dickerson-Testor GG Tx Conversio Kit, $11.50

No. 30K3—SPST push switch for motor contro (2 required) each, $.45

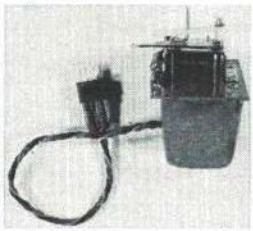
NEW! NEW! NEW!

AAM FEEDBACK COMPONENTS for Rand ac tuators as detailed in American Aircraft Modeler All components available individually or in pack ages. Send stamped self addressed envelope fo price list.

SERVO MECHANICS—Controlaire S-3 and S- and Kraft-Hayes KPS10. For the tinkerer to mak his own digital or analog servo. All are complet with motor, feedback pot, gears, shafts, outpu hardware, etc. S-3 and S-4 in easy to assembl 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—Com plete kit of all electronics needed to make a excellent analog servo with highest resolution from S-3, S-4 or KPS10 mechanics. Use it wit the AAM decoder for simple rudder only NON FLAPPING control. No. 15G31—Lahti Analo electronics only kit, $11.95

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



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.

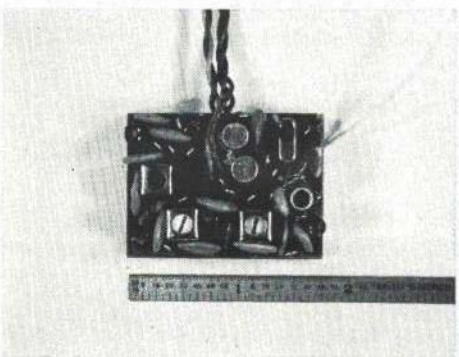
Entire unit weighs 1.1 ounce with leads, completely wired and tested. The high pulse rate required is approximately four to seven times the rate normally put out by your pulse transmitter. For the Commander RO Package, a simple conversion kit, which consists of an extra capacitor and a pushbutton switch 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



COMMANDER PULSE 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 1⅛ x 1¾ x ¾"; 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.

Works with only minor change on Dickerson Skyhawk GG Conversion kit. Uses highest grade miniature components—completely assembled, tested and guaranteed.

Not only is the Commander the smallest and lightest superhet available today—it is also the lowest priced at this special introductory offer.

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

(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)

D & S PRINTED CIRCUIT KIT contains 2 sizes sensitized epoxy PC boards, Ruby masking sheet, solution, etching solution, rubber finger covers and complete instructions. Allows you to make your own photographic type precision bases. No. 28L78—$6.95

Other sizes sensitized bases materials and additional chemicals are available separately. Listed in our 1969 catalog.

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.

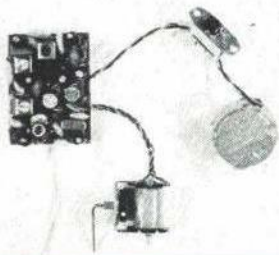
The Baby Pack is for the .010 and .020 jobs although it can be used with tame .049's. Package has two GE 225 ma BHL nickel cadmium batteries and Baby Adams. With wiring harness and switch, completely assembled.

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)



COMMANDER R/O PACK CHARGERS

Transformer isolated chargers designed expressly for the Commander R/O packages come complete with line cord, charging plug and jack and are available in two models—one to fit the Baby Package with its 225 mah nickel cads, and the other to fit the Standard or Stomper Packages with their 500 or 600 mah cells. Each charger will give full charge with 14 to 18 hours of charging time.

Completely wired, tested and ready to go. Simple directions make the chargers a snap to use.

No. 34K4—Commander R/O Baby Charger..$4.95
No. 34K5—Commander R/O S* Charger....$4.95
*S—Standard or Stomper pack

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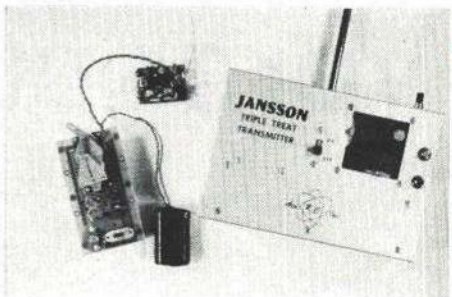
PREVAL SPRAYMAKER can be used for any dope or epoxy mixed to spray consistency. PREVAL combo contains 3 oz. power unit with nozzle, good for spraying up to 16 ounces of liquid, with 4 oz. container. No. 24L17—Sprayer combo $1.29; Extra 3 oz., power unit with nozzle, No. 24L18 98c; No. 24L19—Extra 4 oz. container with lid. 35c.



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 4½". 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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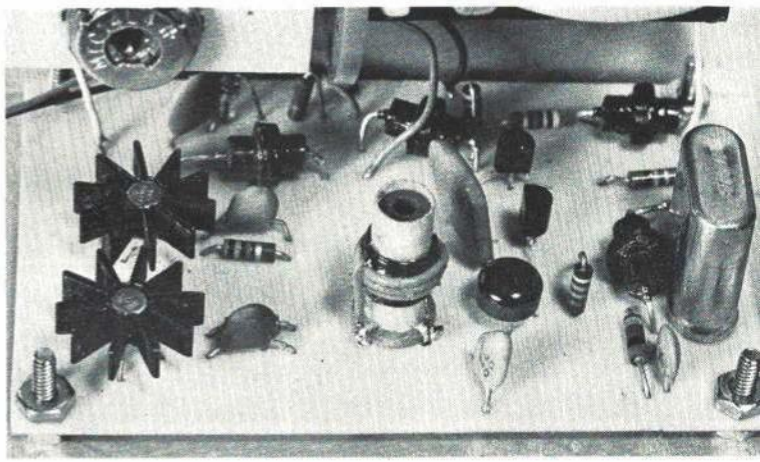
Versapro Series System



Transmitter serves any pulse application. Construction is easy, operation non-critical. Dual-output-transistor RF section is powerful, putting 750 MW into center-loaded antenna. Unit on the right is covered with vinyl wood-grained plastic contact material.

Versapulse Transmitter

Versatile single-channel pulse transmitter offers very high-power output, fully adjustable pulser/audio section, and dual charger for NiCad batteries.

FRED M. MARKS

THE Versapulse transmitter was designed to fill a specific gap in the growth of pulse-proportional control systems. The average pulse-proportional fan usually has progressed from rudder-only pulse-width control to Galloping Ghost with its limitations. The next step usually is to one of the rate-decoded systems, such as Rand Dual-Pak, Simpro III, Jaecks Decoder, etc.

Rate-decoded systems require that the repetition rate be increased from the nominal six pulses-per-second (PPS) rate used for GG to a nominal rate of 12 to 18 pps. Unless the modeler has a fairly intimate knowledge of his transmitter, he can not expect to make circuit changes which permit the higher rates and, even if he does, width interaction is usually encountered. His only alternative is to discard his present transmitter and purchase one of the few dual-rate transmitters available, or purchase a matched system.

The Versapulse transmitter was developed to help modelers overcome this problem and permit the optimum use of pulse capability. Versapulse is: a) modular, in that the RF section, pulser/audio section and charger are separate entities offering an extensive set of options and b) sufficiently flexible to permit its use with any pulse technique. For example, by adjustment of rate and width, the Versapulse has been used in one flying session to operate a magnetic actuator system, a Galloping Ghost System, the SIMPRO III at 12 pps, and a rate decoded/filtered analog system operating at a nominal 30 pps. These systems represent control limits of 4 pps to about 22 pps, and width ratios 95 to 5 and 70 to 30.

In addition to the variation in pulse func-

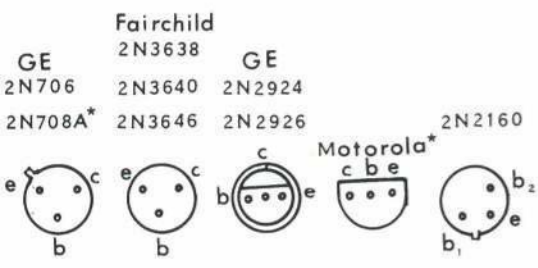
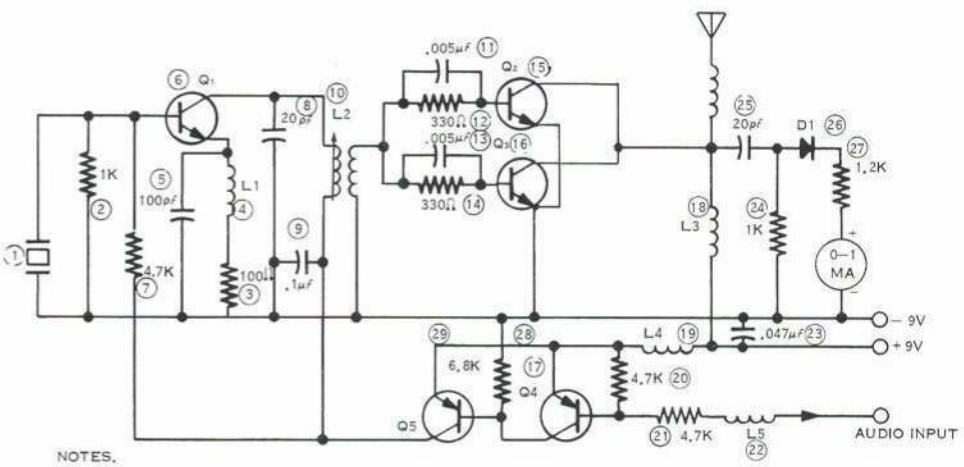


Fig. 1 Top view of transistor leads pointing down and away. Leads will have to be bent to meet PC holes marked e, b, and c for each transistor. Subs not encouraged.



1. TO DELETE METER CIRCUIT, DELETE METER, C , D1, R6, R7.
2. L2 – PRIMARY 12 TURNS #24 ENAMELED WIRE ON 2173-3-3 FORM
   SECONDARY 3 TURNS HOOK-UP WIRE OVER CENTER OF PRIMARY
3. L1, L3, L4, L5–36 RF CHOKES
4. Q1, Q2, Q3, – 2N706, Q4, Q5 – 2N3638, D1 – 1N4009

Fig. 2 Outstanding features of RF Circuit are: dual-output transistors giving high-power output and safe operation if either fails; meter circuit built-in; broad-tuning oscillator; simplified single-coil tuning, center-loaded antenna. Circuit is useful in other applications, such as digital.

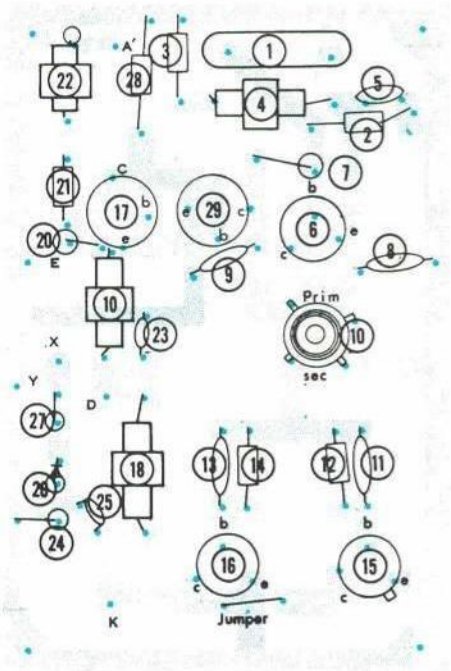


Fig. 3 **RF-section component location, top view. Assemble in order of numbers on each part. Shown full size. Heat sink on transistors #16 and #17.**

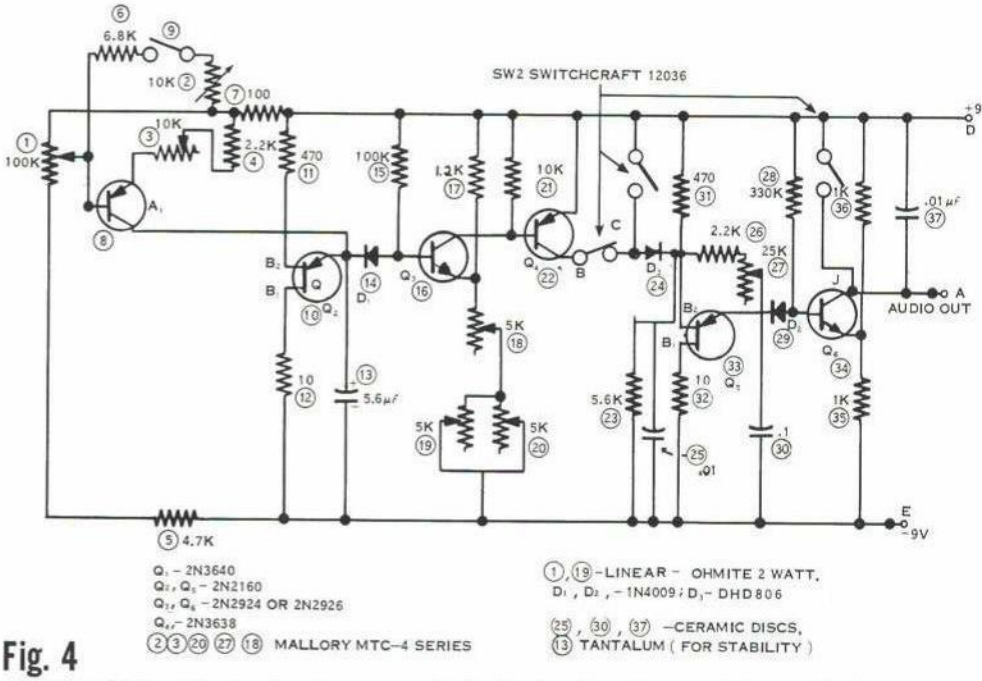


Fig. 4 **Features of Pulser/Audio circuits are use of stabilized unijunction transistor to eliminate rate-width interaction, and simple unijunction tone generator. Assemble the PC board following the numbers on the parts. Check polarity of diodes and electrolytics.**

tions the capability for variable audio frequency is included, at the option of the builder. Some receivers have been built for operation at selective audio frequencies. The audio frequency is variable from about 300 Hz for use with these units. Compatibility has been demonstrated, for example, with the Citizen-Ship AP receiver requiring 3800 Hz tone.

The RF section was kept to a simple one-tuning arrangement. Modulation is 95% and is near sinusoidal. Power output is approximately 750 milliwatts into the final RF amplifier. Efficiency is quite good, thus radiated output from the center-loaded antenna equals or betters that of most current transmitters. The RF section is not difficult. Remember, if you build the 27 MHz RF section, it must be certified by a licensed third-class operator.

The metering circuit capacitively couples some of the RF energy from the antenna output, rectifies it, and uses the resulting DC analog voltage to drive the meter. The meter circuit shows average power and reflects proper pulser operation by oscillating at the pulse rate, and by moving up and down as pulse width varies.

The charging circuits are set up to charge both the transmitter and airborne packs simultaneously or independently. The output can be varied by changing the value of the voltage dropping resistor(s) to permit whatever charging rates are required for your packs.

Construction of the transmitter is straightforward. Use the component overlays and schematics for component placement. Substitution of parts is not encouraged. This transmitter will be kitted by Ace Radio Control, Inc. Those who don't relish making their own printed-circuit boards and bending the case will find this quite welcome. Those who wish to scratch-build will probably wish to take liberty with all stages except the circuit. Individual components and detailed instructions will probably be available from Ace.

General: The PC board layout will accept either the GE encapsulated units or the

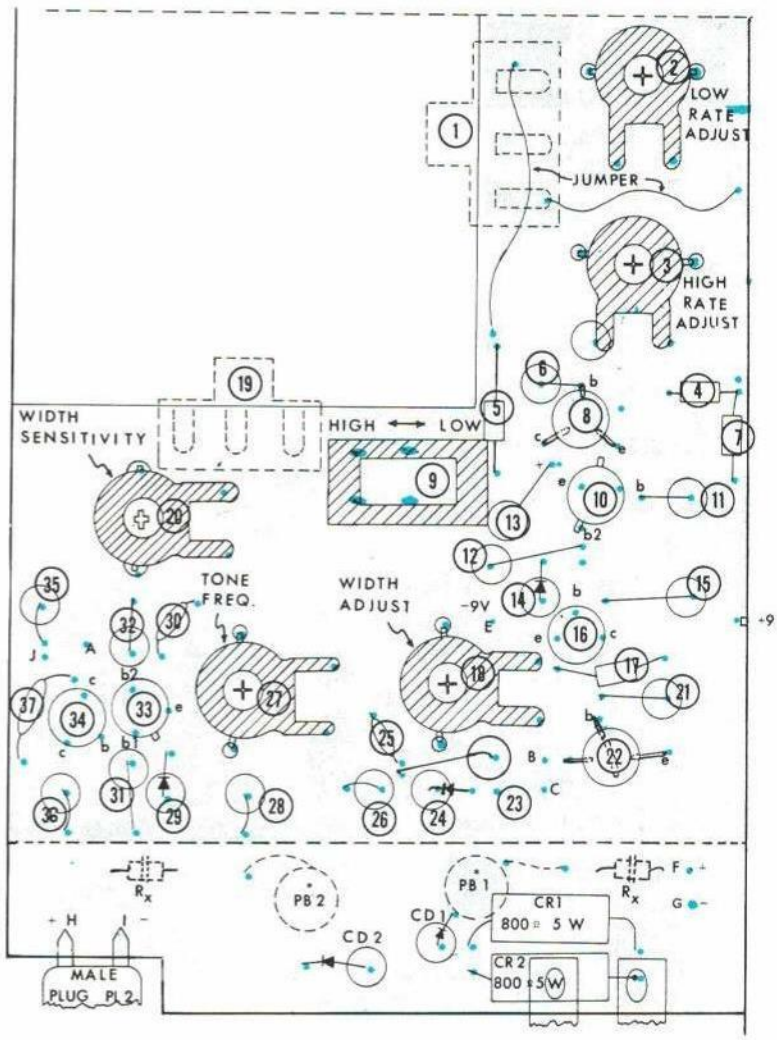


Fig. 5 **Pulser/Audio parts location, full size. PC board can be made by tracing colored lands and holes; fill in lands black, have photo shop make positive film print. Now view it from back side.**

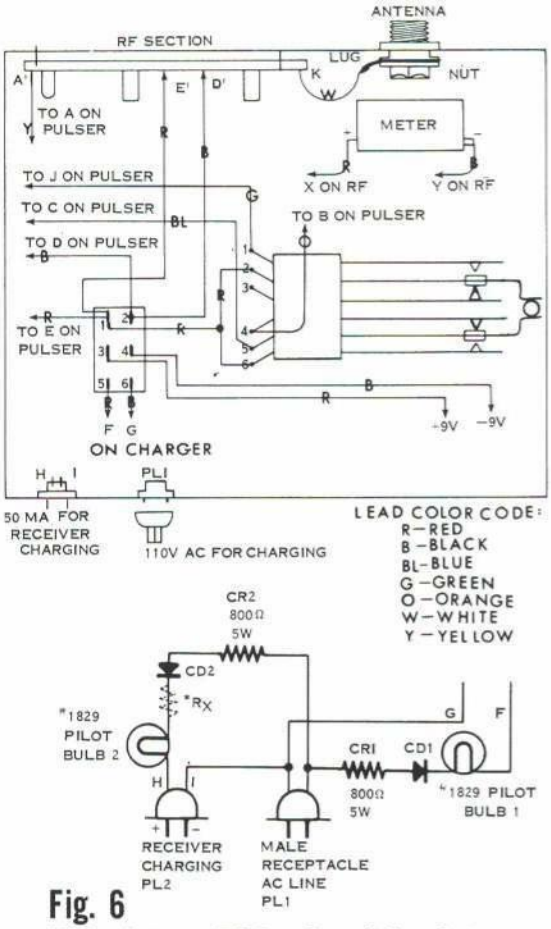


Fig. 6 **Wiring between PC boards, switches, battery, meter, etc. are above; schematic for the charger, below. Leads from PC boards are correct length, so all wiring is direct.**

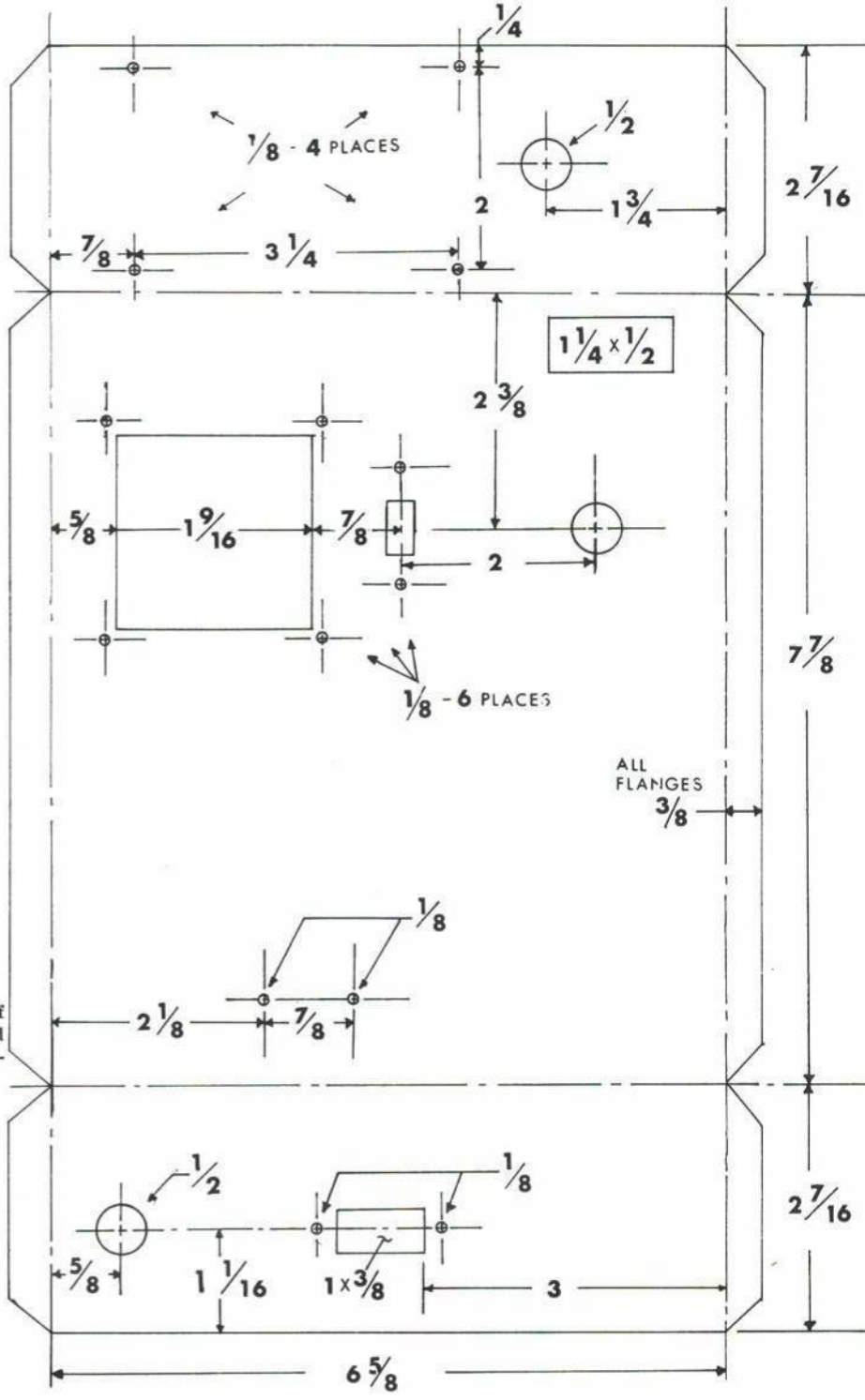


Fig. 7 **The case is made in this order: Cut sheet of .034" aluminum to size, mark all holes and cutouts, bend side lips, top, and bottom — then drill holes and make cutouts.**

Motorola units, but the basing is different. Pay particular attention to selection of the 2N2924 configuration. Refer to Fig. 1 for the basing for all of the transistors used.

The preferred transistor is denoted. The Motorola house number is simply "MPS" instead of "2N." The 2N706 or 2N208A are the RF transistors (Q, Q2, and Q3). The 2N3638, 2N3640, and 2N3646 or their Motorola MPS counterparts are used in other locations. The MPS series is preferred. The 2N2160 is a unijunction transistor and no substitute is advisable.

Assembling the RF module:

a) The RF coil, Item 10, is a CTC 2173-3-3 coil form with 12¼ turns of #24 enameled wire for the primary and 3¼ turns of insulated hook up wire for a secondary. Picture of RF board shows the completed coil assembly.

b) Assemble the components on the RF board as shown in Fig. 3, using the numbered sequence and referring to the schematic (Fig. 2) for component values.

c) Solder a 5" red lead at D', a 5" black lead at E', a 3" red lead at X, a 4" black lead at Y, a 6" yellow lead at A', and a 3" white lead at K. Solder this last lead to the antenna lug. The others will be attached later.

d) Clip all leads on the RF board to within not more than 1/16" from the PC side of the board. (A toenail clipper is ideal for this purpose and no filing is required.) Remove excess solder resin with dope thinner and toothbrush, check for possible shorts.

e) This completes preliminary assembly of the RF section.

Pulser/audio assembly:

a) Assemble pulser/audio components according to Fig. 5, using the numbered sequence and referring to the schematic (Fig. 4) for component values. (Note: if you intend to build in the charger shown in Fig. 6, do not solder pots 1 and 19 with the stick assembly in place until so indicated.) If the charger is not going to be included, solder the lugs of the pots 1 and 19 to the pulser/audio board with the pots mounted in the stick assembly (Bonner Stick assembly shown).

b) Solder a 5" red lead at Point D, a 5" black lead at Point E, a 5" orange lead at Point B, a 6" green lead to Point J, and a 5" blue lead to Point C. These leads will be attached later.

(Note: Leads on the pulser/audio are inserted from the bottom and soldered to the land. About 1/16" of this tinned lead should extend above the PC board to serve as a test point. The other end of the preceding leads will be attached later.)

Dual charger:

a) Mount components as shown at the lower edge of the pulser/audio board except for plugs PL1 and PL2. The two pilot bulbs are soldered upright onto the PC side of the board with a short resistor lead scrap from the brass collar to lands F and H as shown by the dotted lines. They will be visible through the holes to be drilled in the case.

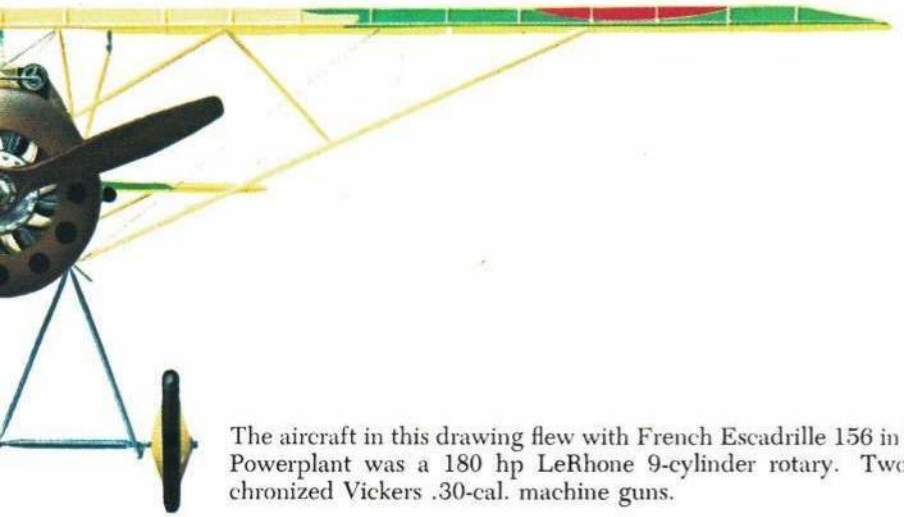
b) Solder a 5" red lead from F, and a 5" black lead from G, to be attached later.

If one or the other charging outputs is to

Continued on page 53

MORANE-SAUL
CARRIED ON

AIRFOIL



The aircraft in this drawing flew with French Escadrille 156 in 1918. Powerplant was a 180 hp LeRhone 9-cylinder rotary. Two synchronized Vickers .30-cal. machine guns.

1917 MORANE-SAULNIER AI (M. S. 29)

ER TRADE MARK
GINE COWLING

AN ADVANCED ENGINE TEST

The Snork 93

You've waited too long for reports like this one. Don't write the editor!

W. R. MAC LAREN, PHD., LLB., SPBSQSA

(Editor's Note: We've been extremely fortunate in getting Professor Mac Laren to agree to preparing technical articles for us, from time to time. His work in the field of model aviation is less well known, perhaps, than his studies of insect life in North European gravel pits, but we're sure you'll find him even less knowledgeable about model airplanes.)

HATS off to engine designer Sam Snork! Sam, being thoroughly alarmed, as many of us are, about the creeping trend of low-cost, high-performance and superb-quality model engines, has decided to do something about it. Early next year, hobby shops will be receiving the first of a whole series of new engines from Snork Tool and Die Company — unless, of course, the market picks up on their current line of plastic food warmers for canaries.

We've just been playing around with the Snork 93 prototype, and this most unusual engine is the subject of this month's test report.

General Description: The Snork 93 is the first engine to appear that combines the low weight of a typical ½A motor with the whopping displacement of 93 cubic inches. Unfortunately, this falls outside of the displacement limits for contest work but is just about right for backyard flying — which most of us prefer anyway.

The engine weighs a little over two ounces, less spark plug and timer assembly. Its displacement of 93 cu. in. is achieved by the rather novel use of combining a bore of ½-in. with a stroke of 27 inches. Although such a long stroke doesn't offer any particular mechanical advantages, the engine can be mounted as a side-winder, with the 27-in. cylinder serving as a dandy leading edge or wing spar. Nice thinking, Sam!

Only the best of materials has been used in this engine. The crankcase appears to have been sand cast from 24ST pot metal, as is the piston. The connecting rod is carved from a very hard wood, possibly maple or teak. Cylinder material is ½-in. I.D. aluminum tubing. A very nice touch is the timer assembly, which is vacuformed out of green plastic, thus providing a tasteful contrast to the crankcase which has been dipped in some kind of purplish enamel. We would suggest to Mr. Snork, however, that the crankcase be dipped before the engine is assembled once production is underway. It tends to clog up the needle valves. (That's right—valves. There are seven of them.)

A most unusual feature of this new engine is its radically new porting. Air for combustion is introduced through a leaky spark plug gasket and swirls down through a large intake port in the top of the piston. Then, it passes obliquely through a series of triangular holes in the bottom of the crankcase and into the lower boost port. As far as we can tell, the air just sits there because there's no way for it to get to the prop nut, where combustion actually occurs. No doubt this small, but annoying, problem will be resolved in the production version. Readers should remember that almost all prototype engines have bugs which have to be worked out, preferably before the engine hits the market. Speaking of bugs . . . (Editor's Note: The entire next paragraph was deleted because the author started to reminisce about bugs he found in a gravel pit near Amsterdam. The story had no relevance to this article.)

Performance and Handling: Included with the engine was something that designer Snork laughingly called a "glow plug." With obvious tongue-in-cheek, Snork allowed as how the engine could be run with this device alone, thus (chuckle!) eliminating the usual coil, condenser and flight batteries. We threw our "glow plug" away but some people will no doubt (snicker!) try it.

For break-in, we mounted a small flywheel and filled its celluloid tank with a mild break-in fuel mixture of moth balls dissolved in ether. To aid initial starting and to help flush out the purple enamel from the crankcase interior, we added 5cc of windshield washer solvent. The spark timer was locked in the full advance position to lend an added thrill.

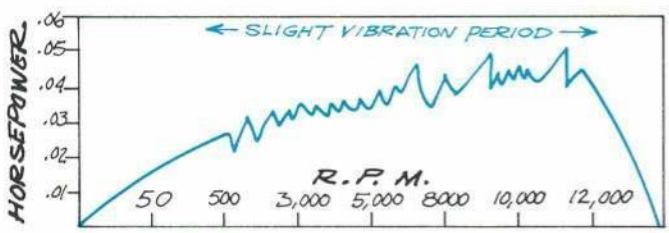
After three hours of steady flipping, the engine started readily enough and ran for almost four minutes before exploding. As the chart indicates, there was a severe vibration period noted between 2,500 rpm and 12,000 rpm — but this should be no problem because the engine's maximum horsepower is reached at a peak of 575 rpm.

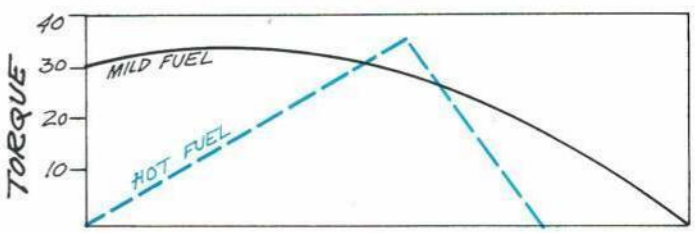
Incidentally, several readers of my prior series of engine tests asked how we manage to plot performance curves and measure rpm without any test equipment. Well, it ain't easy! However, here's a little trick for determining rpm, if your strobotac is broken, etc. Once the engine is running as fast as possible (as determined by its loud noise and the shower of sparks coming out the exhaust stack), grip the cylinder in your teeth. Then, count the number of seconds it takes you to "black out" and multiply this by 1,000. Admittedly, this can lead to burned gums, cracked uppers and blown minds, but that's a small price for the satisfaction you'll get from using a truly scientific method.

To plot a torque curve, for those of you who are technically minded, start with a clean piece of paper. Then, holding a sharp pencil at right angle to the paper, trace carefully around the upper curve surface of a banana. This will give you a nice sloping curve, not unlike those seen in legitimate engine test reports.

Before concluding our remarks on handling characteristics, we'd like to pay special tribute to the Snork .93's excellent throttle. This is a very simple but effective device, consisting of a battery-operated laser beam which activates a pneumatic pump through a series of cams and hydraulics gears. Blipping a button on the accessory transmitter (attractively priced at $395.00) creates a negative magnetic field in the spark coil which, in turn, increases engine speed enough to freeze up the piston. Using the cleverly simple device according to the 185-page instruction manual, we obtained a high-low range of 35 rpm before the engine seized and blew up.

Summary: The Snork 93 will most likely revolutionize model aviation. It has been designed for a wide range of applications but lends itself best, we believe, to indoor radio-controlled speed flying. Since there's no such event at present, we are hopeful that Sam Snork's demonstration at the Nat's will provoke some real interest in this much-neglected phase of our hobby. Let's all get behind this effort and push for a rules change that will permit us to use the full potential of this fascinating engine!





GETTING STARTED IN R/C

A look at the R/C market makes equipment choice easier.

HOWARD MC ENTEE

HAVING steered the reader through the rather confusing terminology of present-day multi-control proportional, as opposed to the simpler control systems, perhaps we should give him a little guidance on what he'll find in the market. The variety of equipment available is in some ways even more confusing than R/C terms!

Probably the first consideration is the number of controls you will wish to have available. As noted in Part 18, four controls are considered vital for present-day planes of top performance — rudder, elevator, ailerons and throttle. Practically all prices quoted for multi-control systems are based upon the transmitter and matching receiver, the necessary batteries and *four* servos — regardless of how many servos the system can actually handle. Actually, it doesn't cost too much to build an extra control function or two into a transmitter and receiver — but the extra servos do up the overall price considerably — about $35-40 per servo. There are many four-control propo systems in use today, their owners completely satisfied with what they have. If you have an urge to try a scale plane later on, though, an extra control or two could be most useful.

Perhaps we should mention that most of the high-performance multi-control planes of today have ground steering and brakes, but these are normally operated from the "vital four" controls; steerable wheels are linked to the rudder servo, while brakes are generally set up to operate when full down elevator is signaled. Other auxiliary controls can be linked to main four servos — for example, you can drop parachutes or bombs with gadgetry hooked to the throttle servo.

Next, comes frequency. If you happen to have a radio amateur license, you might want to operate on one of the spot frequencies recommended in the amateur 50-54MHz band for R/C by the AMA. If not, you can select either 27 or 72 MHz spots. Best bet here is to query R/Cers in your own area as to their preferences; in some areas, certain transmitters from other services will bother certain frequencies which you should naturally avoid. Citizens Band phone interference is worst in large population areas where there are simply more people. In some sections, TV stations can bother 72 MHz. Actually, most new equipment sold today is probably on the 72 MHz spots; some large manufacturers (who supply equipment for all R/C frequencies) are producing 75% or more of their apparatus on this band. Again, check with local users and sellers, to see which frequencies are safe in your area, and which are preferred.

There is the matter of control sticks. Most makers today can supply transmitters with one or two sticks, so we can presume this is strongly preferred. Some users have a real preference for a single stick; for example, if you have flown pulse proportional extensively with either Galloping Ghost or separate servos and a single-stick transmitter (virtually standard in such equipment), you would probably prefer your digital transmitter with a single stick also. Most manufacturers can provide transmitters either way, but not all do. Some makers will even provide left-handed single stick transmitters! If you have previously flown multi-controls with a reed transmitter, you will certainly prefer a two-stick transmitter.

If you get a two-stick job, most makers will put the control functions on the sticks as you desire. The most widely used arrangement has the ailerons and elevator on the right stick, rudder and throttle on the left. Other arrangements are possible, though. If you have a preference, make it known.

With a dozen or so concerns making multi-propo in the U.S.A., and imports from several countries available, the newcomer can be somewhat bewildered. There are strong area preferences all over the country; one or two good flyers start using a certain make, others follow, and soon that becomes known as Orbit (or Kraft, or Logictrol, or "Brand X" or whatever) territory. In another area a few hundred miles away, some other brand might be tops.

Some makers are setting up supply and repair depots remote from their plants, to speed up service. This is worth considering, if you happen to be located a thousand or more miles from said plant. We expect this practice to become more widespread; it does save the user time (and postage money) in getting fast repairs. No avid flyer wants to be grounded for a long period while his equipment is "back at the factory." Certain makers have a good rep for returning repairs in a hurry — others are not so good. Again, if possible, check locally to ascertain which makes are best.

It might boil down to a matter of "features" for you. While digital equipment is basically alike, some makes have special circuit features or different control totals, others offer several servo choices or perhaps special servo mountings, some outfits come with a charger built into the transmitter and some don't. Not all manufacturers offer equipment on all R/C frequencies; several do not have it on the 50 MHz band, but we believe most do offer all the spot frequencies on 27 and 72 MHz.

Unlike the case of automobiles, there isn't a vast variety of "options at a slight extra cost" (slight!!?) in R/C equipment. With most "full house" systems (a term meaning the system will handle at least rudder, elevator, ailerons and throttle), you get the transmitter, receiver, all batteries and a charger, and four servos for the basic price. There is little else to buy, except for an extra servo or two. The options we have explained above. Incidentally, some makers charge slightly more for a single-stick transmitter (definitely more for a left-handed one!), or for certain frequencies, but the extra cost is nominal.

And finally, we must mention kits. You can buy a complete kit for a top-grade digital multi system today from several makers — and probably more will be coming. It's an excellent way to save considerable money (as much as 30-40%) over the cost of finished equipment. Most important, you will be able to make most repairs and adjustments yourself, thus saving shipping time and expense. Though the equipment is definitely complex, the instructions with these kits are extremely detailed, and you don't have to be an electronics-type to do the job. The kit makers offer help, if you do have problems.

The first part of each year brings the Calif., Toledo, Buffalo, and Seattle model-industry trade shows where one can examine all the various brands of radio systems and planes.

NEW PRODUCTS CHECK LIST

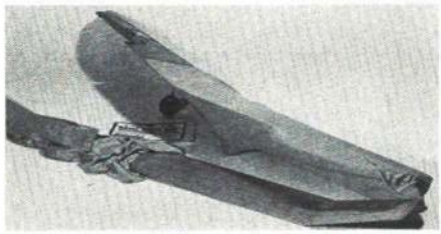
Write the manufacturers for more data; tell them, "I saw it in American Aircraft Modeler."

Vic's Custom Models/Phantom Kit. Man-made materials make this multi R/C kit (an ARF) one of the sleekest we've seen. Use any engine .45 to .60 in this 66" span model. Fuselage and fin are fiberglass. Wing and stabilizer are of plastic-covered foam with molded plastic tips. No finish is needed; add decals or other trim if you want. All hardware—linkages, landing gear, etc. is included. Cost of complete kit is $69.95. VIC'S CUSTOM MODELS, 618 Cowpath Rd., Lansdale, Pa. 19446.

B & N Model Accessory Co./Engine Mufflers. Announcement from B & N concerns their repair service for B & N mufflers that have been damaged through use. As long as the manifold is intact, they can rebuild the muffler for a charge of $3.00 ppd. All of their mufflers carry a one-year guarantee against manufacturing defects.

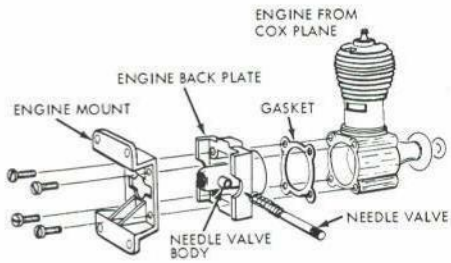
Enya 60 and Veco 61 mufflers were redesigned, and they now take the popular strap and screw mounting arrangement.

Replacement spring or strap mounting hardware kits are available at $1.19 ppd. or from your local dealer. A pre-flight check for wear and stretch in the mount gear can prevent loss of a muffler in flight. B & N MODEL ACCESSORY CO., 94 Cedar Drive, Plainview, N. Y. 11803.

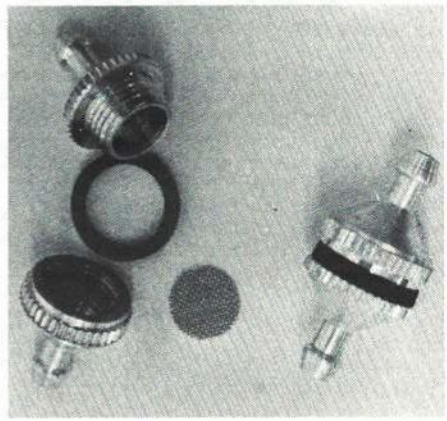


Practical Products/Wing Bags. For wing protection during storage or trips to the field, these are practical indeed. Two bags, each 40" long, will easily cover an 80" span wing, including landing gear. Use only one bag for small wings. Material is a soft, knitted cotton tube closed at one end and with an elastic-edged opening at the other. These are available in pairs at $4.50 ppd. Write: PRACTICAL PRODUCTS, Box D, Troy, N. Carolina 27371.

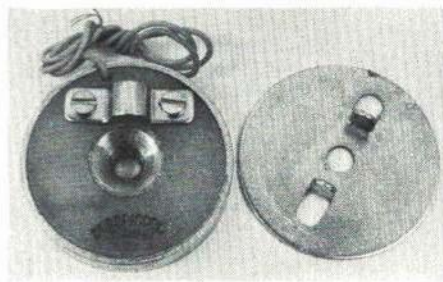
Aviation Magazines/Back Issues. This firm recently acquired the entire stock of back-issue aviation magazines from John W. Caler, Aeronautica. Adding this to their original supply now gives "Aviation Magazines" the largest inventory of back-issue aviation magazines in the world, is the claim. There's a heavy emphasis on model aviation publications, too. They also carry a large stock of original, out-of-print, full-size plans by Air Trails and Hobby Helpers. Query here: AVIATION MAGAZINES, 24248 S. Crenshaw Blvd., Torrance, Calif. 90505.



Carl Goldberg Models/Engine Mount. Here's a simple, yet effective mount that enables a modeler to install one of the Cox .049 engines (with plastic backplate) on any model he chooses. Generally this engine is found in the plastic, ready-to-fly type of control-line model. Often the modeler wears out the model long before the engine. Now these engines can be put to good use. The special mount with fuel line and a balloon tank is just 79c, and the instructions are complete! Write: CARL GOLDBERG MODELS, INC., 2545 W. Cermak Rd., Chicago, Ill. 60608.



Hobby Lobby International/Accessories. New fuel filter by Kavan is turned of aluminum. The two, threaded halves allow you to disassemble the unit for cleaning of the bronze filter screen. It's lightweight too. Price is just 59c.



Next is a positive-acting, electric brake that operates on three to six volts. Sturdily made of steel, Nylon and a f/glass braking surface. Unit anchors to landing gear strut with two screws and a metal strap and is twist-free. Thickness is only 3/8". Each brake costs $5.95. More info from: HOBBY LOBBY INTERNATIONAL, 2604 Franklin Rd., Nashville, Tenn. 37204.

Lanier Industries, Inc./Cessna R/C Kit. This is Lanier's first, almost-ready-to-fly (ARF) trainer with a wing span of only 48"; a good size for the simpler control systems as well as the smaller 3-control proportional rigs. Wing area is 480 sq. in., and engines in the .15 to .19 size range are recommended. It builds as quick as the other Lanier models, too. Straight-forward lines and component layout give it enough stability to fly very well as a free flight. Kit price is $34.95. Write: LANIER INDUSTRIES, INC., Briarwood Road, Oakwood, Ga. 30566.

APRIL 1969

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics • 1239 Vermont Avenue N.W., Washington, DC 20005

Seventeenth AMA President Looks to the Future

Looking ahead to the next two years as president of our Academy, there are many things I would like to see accomplished. Since this is certainly not a one man operation, but rather a combination of many hours of time, hard work and effort by a lot of people, I will be asking many of you to help.

One of the first things I would like to get started is exploring the idea of three national societies or organizations within the AMA, each encompassing the operation of one of the major categories of our hobby. To initiate this program and to advise and assist the office of president in matters specific to their particular category, I propose to appoint the other 1968 candidates for AMA president, John Clemens, John Pond and Maurice Woods, as Presidential Assistants to be responsible in the areas of Control Line, Free Flight and Radio Control, in the order named. It is my sincere wish that these men will accept the appointments so that we all may benefit from their experience and ability.

I would also like to say to the vice presidents who were successful in the recent elections that there are some other mighty good men available in their districts; men with enough interest to volunteer to take on a load of responsibility and spend a lot of their time working for modeling and the Academy. The vice presidential candidates who did not get elected, for example, should be excellent choices. There is plenty of work to be done, so it is my recommendation that you offer them the opportunity to help.

In an effort to facilitate conducting Executive Council business we will very likely try to get the Council together twice a year instead of once a year at the Nationals as in the past.

One situation which is of some concern to me, and which has been unpleasant and unnecessary, is the amount of valuable space used in our fine modeling magazines to stir controversy, usually because someone doesn't know the facts or doesn't trust someone else to act in the best interests of our hobby. I will do all I can to see that more information is made available, and I will expect to report to you on Academy activities once a month either through the monthly club mailing or our magazine.

One challenge I would like to pass along especially to our clubs, but also to all our members who are not yet associated with a club: Last year we had about 25,000 members. Presently we are up to about 17,000, which is an excellent going rate. There must be at least 100,000 other modelers, sport flyers or interested people, who do not yet belong to our Academy. I would like to ask every AMA member to sign up at least one other new member.

If any of you have any constructive ideas or suggestions, they will be very welcome. Please pass them along to your vice presidents (with a copy to me via AMA HQ) and they will get attention.

John Patton

John Patton, AMA's 17th president, seeks exploration of the idea of societies within AMA which would assume substantial responsibility for their respective categories. Photo is from the 1968 Nats at Olathe Naval Air Station where he was director of the RC pattern event.

Moon Flight Commander Was an AMA Member

Col. Frank Borman, command pilot of last Christmas' moon flight, was building model airplanes as recently as a couple of years ago, while training for NASA's Gemini space missions — until the pressures of that training prevented further modeling activity.

Borman's history as a model builder and flyer goes back to the thirties, in Tucson, Arizona, when he was in the sixth and seventh grades. He was an avid free flighter in those days and credits the experience as a stimulant to his career. Col. Borman also pointed out that a principal gain from the experience was patience, relating to the problems of starting engines and overcoming discouragement of model crashes, to keep trying for successful flights.

The source of this information was an interview granted to a reporter for the AMA in 1966, published in the Model Aviation section of the July/August issue of *American Modeler* that year. Some other statements from that interview:

". . . I can't think of a better hobby or better interest for a boy.

". . . . I wish that everybody could have gotten as much out of model aviation and had as much enjoyment from it as I have. . . . it helped to further my career and stimulate an interest in aviation . . .

". . . My boys build models now.

". . . My wife is an expert U-Control flyer. I got her interested, and she is better than I am on it.

"I was a member of AMA . . . when I was in the seventh or eighth grade. . ."

16th President Looks Back

It is with mixed emotions that I write this final letter as president to my fellow members of the AMA. As I think back to the start of my term on January 1 of 1967, I realize that I have not been able to accomplish all that I felt should be done. However, like all men who have held any public office, I found that it's a lot easier to talk about than it is to get it done. There are still many ways to improve upon our national organization although I do believe we have come a long way and that in the past two years we have watched it grow up.

I think that we all realize that it is not a hobby any more but rather a sport. We have also achieved a national recognition which I feel is due primarily to the vast increase in radio control activity. We have more and more professional people coming into RC, and these people to a great extent are responsible for this. I sincerely hope that within the next few years we will be as strong in the sporting field as golf and some of the other leisure-time activities. With hard work and proper leadership it can be achieved.

I would like to take this opportunity to thank all of the many people who worked so hard for me and with me during the past two years. Without them it would all have been impossible. In particular I would like to thank the following: John Worth and Frank Ehling of the Headquarters staff, the Executive Council, the many people involved in the Nats operation, the U. S. Navy whose help has been invaluable, and last but not least, I thank also the hundreds of people who worked on the various committees in FF, CL and RC. Again, without them nothing could have been done.

My congratulations to John Patton. I'm sure that he will do a fine job, and I ask that you all give him the fine support that you have given me. It has been a pleasure to have worked with and for all members of the finest aviation organization I know of, the Academy of Model Aeronautics.

Cliff Weirick

First President Reminisces

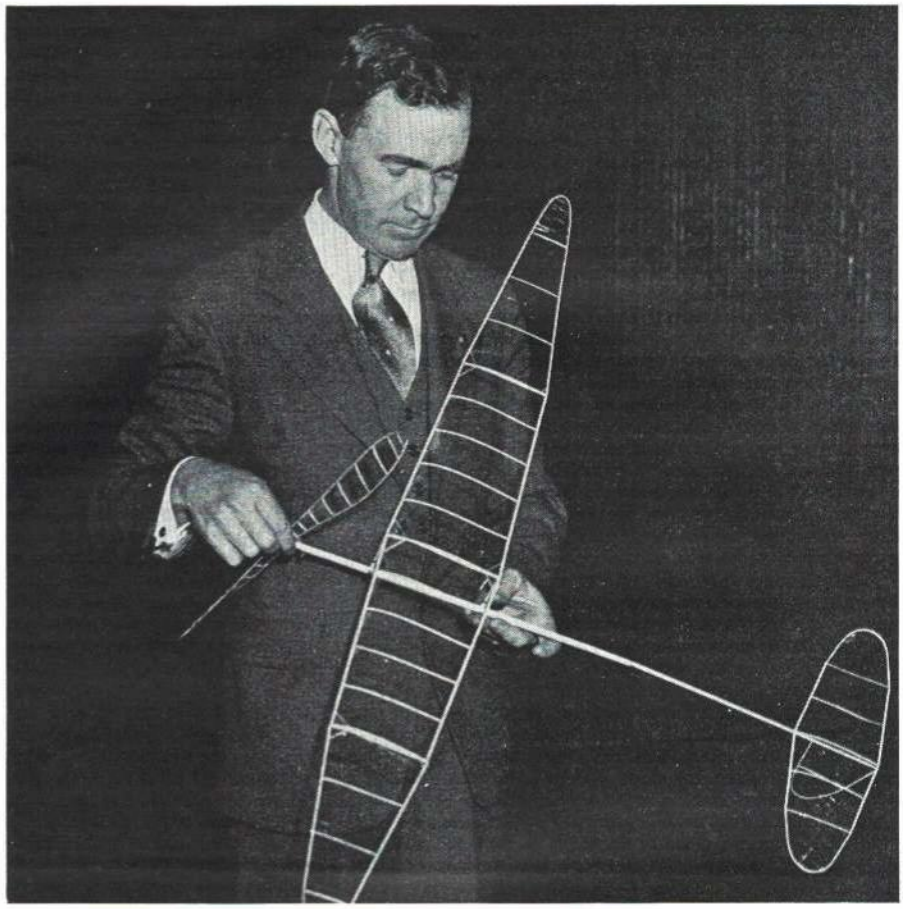
Arriving home from the 1936 National Championship meet in Detroit, with the Boston modeling delegation, I must have had sort of a suppressed grin on my face as my wife met me with the query, "well, what big job have you let yourself in for now?!" I had to admit that at the meeting following the Nats, the Provisional Council had named me as president among other officers of a new national organization to be known as the American Academy of Model Aeronautics.

"It won't take much time," I countered. All officers will serve only until the first annual meeting. Lt. H. W. Alden, our secretary-treasurer, has promised to attend to the day-by-day operation as he had been doing as chairman of the Model Airplane Committee of the National Aeronautic Assn.

The first annual meeting of the AAMA elected the same slate of officers named by the Provisional Council. Then the elected officers were confronted with four immediate problems that demanded solution. They were how to assure continuity for the Nats as well as the new Academy, how to improve our National Championships, how to carve our independent status from NAA while retaining their help, and how to put out a monthly publication without money in the treasury. The first three I solved by appointing committees to consider their problems and report back within the year. The fourth, dealing with the publication, was passed along to Al Lewis, the next president. Great credit goes to Al for keeping communications open between the leaders, the model airplane suppliers, and the 400-500 contestants who would become the potential members of the Academy in the coming years.

The pioneer modelers I associated with prior to the formation of the Academy in 1936 are people whose names I shall always remember. Their influence and advice, both spoken and written, at that time must have had a profound effect on the direction and value of our Academy of Model Aeronautics of today.

Willis C. Brown



In vogue for their day: Upper photo, from 1935, shows first AMA president, Willis Brown, with the "in" plane of the day — an indoor "mike"-covered model with which he placed 6th in 1935 Nats. During the term of the outgoing AMA president, Cliff Weirick, RC was (and continues to be) highly popular. Shot of Weirick with RC model was taken in 1965. He was on AMA's 1967 U. S. RC team.

Once Over

AMA Monoline Okay

Rumors to the contrary, it is still perfectly "legal" to use a single line for maneuvering AMA rule control line models (where such use was previously allowed). At the time of this writing there was no proposal before the AMA Contest Board to restrict single line use. Everyone should be aware that minimum wire sizes were increased; however, they were increased for both single and two-line systems. See report in February AMA News.

Not to be confused with AMA rules mentioned in the first paragraph, the Federation Aeronautique Internationale (FAI) has revised its rules for control line speed contests to exclude single line control systems. The FAI rules are particularly applicable to world championships, international contests and programs leading to selection of U. S. teams.

Open Letter to Santa

Writing in the Monmouth (N. J.) MAC Newsletter, Editor Dick Sarpolus asked the jolly old gentleman to give club members 1. A .60 engine that always idles, is easy to start and never stalls; 2. Servos that never stop working; 3. A frequency that is never crowded; 4. A nose gear that never breaks; 5. Glow plugs that don't burn out; 6. Friendly contest judges; 7. Lots of thermals for soaring; 8. A double stall turn that always works; 9. Reverse spins that stop on the point; 10. Good flying weather every Sunday; 11. Lots more years to enjoy the sport.

Had members of the Monmouth MAC been good little boys? Did Santa Claus come through?

'69 Indoor Rules Correction

Following an unforeseen complication, FF Contest Board Chairman Joe Boyle asks us to announce that the new official flight definition for indoor rubber, as printed in February AMA News, is withdrawn for the present time — that the 1968 rules regarding official flight, unofficial flight, number of flights, and time of flights will continue in force throughout 1969.

In the meanwhile the Contest Board will be working toward clarifying the complication with a view to having new official flight definitions applicable in 1970.

Flying RC Judges

The South Carolina Radio Aircraft Modelers, Inc., an association of S.C. RC clubs, are facing the age-old problem of members of club-hosted meets wanting to compete. This has come up in all categories of model flying, a natural thing considering that the most active flyers are most likely the ones the Contest Director wants to tap for officialdom.

SCRAMer Mel Richardson proposes to let judges fly but not judge the class in which they are competing. Put simply, a judge competing in Class B would judge in Class A and Class C Novice and Expert, but would not judge anyone competing in Class B. In order to accomplish this, it was said, each of the member clubs of SCRAM would have to make available a few judges. The proposal was to be discussed during the January meeting in Columbia, S.C.

TT's Graduation Program

The Thermal Thumbers, a free flight club devoted primarily to indoor and outdoor rubber and glider activities, is active again, says Russ Johnson, club president. One of the current TT projects is the sponsorship of a Junior Novice HL glider event patterned around the rules used for the AMA-Navy-HIAA regional program.

Only model requirement is that the glider have a maximum span of 12" — can be store bought or homemade. The TT's allow 10 tosses, best time counts. They let all Juniors enter who have not won a trophy. For prizes a trophy is given for first, ribbons to fifth, plus selected simple free flight kits.

The winner "graduates," becoming ineligible for future events of this kind, thereby providing a stepping stone between the "store bought" and "crafted" models.

The Thermal Thumbers also are holding close-in, small field events in an effort to achieve more and broader participation. Johnson says they get good turnouts. Everyone has fun, more spectators, more new interested modelers.

Photo shows Ross Steckel, Van Nuys, Calif., at recent TT meet. With A-1 glider shown, Steckel set Open record with a flight total of 22 minutes, 54 seconds.

NMPRA Champions, Elections

The win of Granger Williams at the Nats gave him enough points to capture the National Miniature Pylon Racing Assn. 1968 Season Championship for Formula I by such a wide margin that he was also the Overall Champion. Final standings:

Formula I: **1. Granger Williams, 160 points; 2. Harold deBolt, 110; 3. Whit Stockwell, 106; 4. Joe Foster, 105; 5. Jack Stafford, 103.** *Formula II*: **1. Bob Noll, 25 points; 2. Randy McGee, 8; 3. Joe Foster, 7; 4. Tom Protheroe, 6; 5. Gil Horstman, 5.** *Overall*: **1. Granger Williams, 160 points; 2. Joe Foster, 112; 3. Harold deBolt, 112; 4. Whit Stockwell, 106; 5. Jack Stafford, 103.**

In the NMPRA elections Tom Protheroe was named president and Gil Horstman secretary-treasurer. Vice presidents as follows were elected for the areas indicated: John Krauer, North Central; Joe Bridi, So. Calif.; Harold deBolt, N. Eastern; Bob Lutker, Southern; Bob Francis, Western.

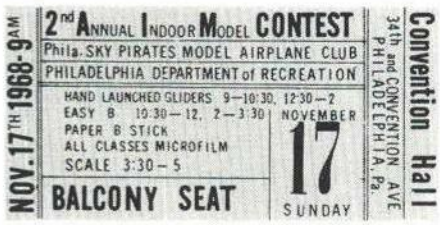
Rockford to Inaugurate Field

Word is that The Rockford (Ill.) Aeromodelers will officially inaugurate its new paved and fenced model airport probably this June with a Class AAA meet. Events planned are mostly control line, plus possibly a Delta Dart (or AMA Cub) event.

FAI Record Fee Reduced

For 1969 the individual sanction fee for FAI international record attempts will be $1.00 instead of the previous $3.00. The reduction is made possible by making the FAI Record Newsletter an optional item, obtainable as part of the Competition News Service. Otherwise the record procedure is the same as in 1968, detailed on page 61 of the 1968 AMA rule book.

Ticket Promotes Philly Meet



Someone had his thinking cap on when he devised the announcement for the 2nd Annual Indoor Model Contest — in the form of a give-away sports activity ticket. Bet this attracted more spectators than most any other kind of announcement would have.

CL Innovations

A recent edition of the Newsletter of The Association of Model Airplane Clubs of Greater New York tells of an interesting control line event put on last year by Der Luftmiesters Model Flying Club. The event called for one model to be judged on a four-way basis — beauty, speed, endurance (on three ounces of fuel) and stunt — with entrants divided into beginner, intermediate and expert classes.

More on Profile Carrier

Responding to questions posed by AMA members, the chairman of the 1968 Control Line Contest Board, Howard Mottin, issues the following statement of position.

"In the *Profile Carrier Class* the term *production RC type intake throttle* means: "the plain bearing engine must be equipped with a factory produced single barrel intake throttle of the same make and displacement size as the engine. The intake throttle may be coupled to a corresponding factory installed exhaust throttle if the engine is sold with one, but this can be removed if the modeler desires. An engine will be acceptable if it is advertised and sold as a factory produced ready-to-run unit. The use of any homemade or custom produced throttle, dual carb set-ups and throttles from different makes and sizes of engines are unacceptable."

"Generally, the intent of the rules for the Profile Carrier Class is to provide for use of ready-available equipment which can be purchased by the less experienced modelers for use in this event, rather than custom made equipment."

School Club Going Great

Pictured are members of the Windsor Model Airplane Club of the Central School, Windsor, N. Y. As can readily be seen, AMA Racers and Cubs are big with the group.

If all goes well, reports club advisor Ed Abram, the club plans to load all its AMA members on a bus next summer and head for the Nats at Willow Grove, Pa.

Continued on page 50

Record Reviews

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

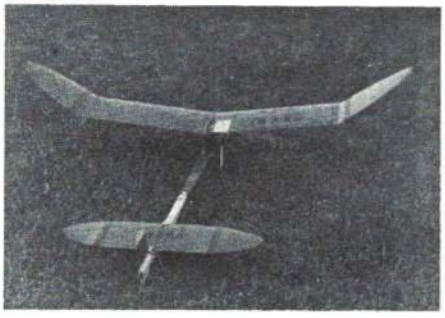
CL ½A Proto Speed national AMA record, Senior age class: 89.22 mph, established by Henry M. Nixon, Jr., Wayne, N. J., on September 2, 1968.

Nixon's original design model, of conventional planform, employed moderately high aspect-ratio wing and stabilizer (22¼" wingspan, 2½" center chord tapering to 1⅝" tip chord; 12" stab span, 2¼" center chord tapering to 1¾"). Wing had a lifting airfoil of 12% thickness. The model was built from Sig balsa and covered with Sig Jap tissue and Sig dope. It was controlled with Nixon's own torque single line unit in the model, in conjunction with a Stanzel handle. It used a full Tatone pan, wire gear, and Perfect wheels.

Power was a Cox Tee Dee, cleaned, turning a Grish 4.5 x 6 prop. Reportedly, the fuel was a Warren Kurth formula. Model weighed 3¾ ounces.

Nixon indicates that the record flight had a slower first lap than usual, but this was compensated for by an outstanding top speed due to some new propeller theories he has been experimenting with.

FF FAI Power national AMA record, Open age class: 36 minutes, 42 seconds, established by Robert K. Sifleet, Owings Mills, Md., on July 14, 1968.



This original design model, powered by a 1965 model Super Tigre with tuned pipe, is apparently the same one Sifleet used to gain his position on the 1969 U. S. FAI Power team. Prop used on the 28.65 ounce model was a Rev-Up 7½ x 3¾. Sifleet says the exhaust timing of the engine was advanced 5°-10°, used a K & B long plug. The tuned exhaust system, by Richard Hall, was similar to the Lindsley KLH type.

The pylon-design model had a wingspan of 60½", 8 3/16" major chord. Stabilizer span was 26½", 6¾" center chord. Tops of both surfaces covered with Sig balsa. Wing and stab both had flat-bottom airfoils — wing 9% thick, stab 7½%. The stab and wing tip trailing edges were made of strip laminations, a combination of balsa and bass. The engine flood-off, auto rudder, auto stab and dethermalizer all were operated by a Seelig timer. The model was constructed with Ambroid and Franklin Tite Bond glue, and used a Perfect #6 fuel tank, silk covering, and Pactra finish.

This flight record is comprised of seven 3-minute flights, then 1-min. progressions for additional flights. Sifleet indicates that when he was trying for his 11th flight (with 7-min. limit) he threw the model too hard, which resulted in the pipe coming out of tune and the engine running poorly — a 42-second flight.

Indoor Paper Stick national AMA record, Ceiling Cat. I, Open age class: 13 minutes, 6 seconds, established by Robert Platt, Jr., Yorktown, Va., on September 28, 1968.

An original design powered by an 18" loop of Pirelli, .10" x .043", lubed with a mixture of green soap and glycerine. Prop of 15¼" diameter was designed with blade area ahead of the spar, so as to increase pitch while under power; Platt says sweepback of blades was needed to make such a propeller run smoothly.

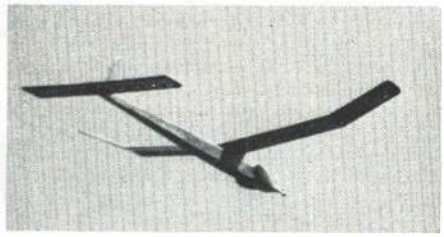
Model was constructed from Micro-Dyne balsa, covered with Micro-Dyne condenser tissue. Wing has span of 27¾", major chord of 4¼", 5% cambered airfoil at 45% of chord. Stab has 13" span, 4¼" center chord, 3% cambered airfoil at 45%.

CL Navy Carrier Class I national AMA record, Open age class: 552.04 points, established by Howard C. Mottin, Warren, Mich., on August 8, 1968.

Mottin's model, a Grumman Guardian of 30" wingspan, 20" fuselage length, was powered by a Super Tigre G21/40 swinging a Rev-Up Series 300 prop of 8" diameter, 9" pitch. It weighed 27 ounces, had spring-loaded wing flaps linked to the droppable tail hook which worked on full down elevator.

Balsa covering was used on the Guardian, with Hobbypoxy enamel finish. The J. Roberts 3-line bellcrank and handle were used for control. The engine was reported to be stock except for the addition of Mottin's own barrel-type throttle on the exhaust and an original fuel valve. Also used were Dan's streamline wheels, Rogo fuel, and Finishing Touch decals. Construction plans were featured in the January 1969 *American Aircraft Modeler*.

FF Wakefield Rubber national AMA record, Junior age class: 13 minutes, 41 seconds, established by Gary Heeb, Xenia, O., on August 6, 1968.



Model was designed by Gary's dad, Frank Heeb, and was featured in the March 1967 *American Modeler*, the "Stratowake." Gary's 8.2 ounce model used ¼" Pirelli rubber, 14 strands of 17" length, Sig rubber lubricant, 22" dia. by 22" pitch prop. Model was covered with Sig tissue, finished with Sig dope.

Gary's record, set at the 1968 Nats, was made with only 6 of the allowable 7 flights. His models, only two permitted then by the rules, were both lost by the 6th flight.

CL Jet Speed national AMA record, Senior age class: 166.60 mph, established by Jack Olson, Fargo, N. D., on August 18, 1968.

Model was a Hoyt Sidewinder, modified, of 24" wingspan, powered by an OS Max Jet, cleaned, and with modified backplate, Champion plug. It had a homemade single line torque unit, Speed Master control handle, 8-oz. homemade tank mounted even with engine for force feed. The model, finished with white Varathane, weighed 34 ounces.

FF Wakefield Rubber national AMA record, Junior age class: 19 minutes, 24 seconds, established by Jon Davis, Albuquerque, N. Mex., on October 6, 1968.

Model used was designed by James P. Taylor, weighed 8.12 ounces. It has a two-piece tubular boom fuselage, the front of which was an Estes rocket tube Cat. #BT-55, nylon and tissue covered. The rear boom of 1/16" balsa was shaped over a tapered form and covered with Jap tissue, held to front with rubber bands. A low pylon, in which the Tatone dethermalizer timer was mounted, carries the two-piece 49½" span wing — plug-in style, polyhedral. Wing used the Benedek B-7406-F section, stab the Benedek B-6405-B.

Prop design was similar to Hatschek's in 1965 *American Modeler Annual*, had 24" diameter, 26" pitch. Power was by Pirelli rubber, 6 mm, 16 strands. Model was covered with Sig Jap tissue, Spedolac dope.

In the process of flying for the record, the wing was folded and the prop broken. Hastily Taylor epoxyed the wing and prop, enabling him to score two more maxes one and a half hours later.

FF A-1 Towline Glider national AMA record, Senior age class: 13 minutes, 26 seconds, established by Kurt Smitz, Kenosha, Wisc., on August 5, 1968.

Model used was built from a Midwest Products Co., Lil Dip kit, designed by Charles Sotich. It had a 46½" wingspan, 5⅛" major chord; stab is 18½" x 3". It was covered with Sig Jap tissue, doped with Cooper Superflite nitrate. It weighed 6.2 ounces.

Kurt established a Junior record with this model at the 1967 Nats, then repeated in Senior at the 1968 Nats.

Indoor D Stick national AMA record, Ceiling Cat. I, Open age class: 17 minutes, 45.8 seconds, established by Harold Crane, Hampton, Va., on September 28, 1968.

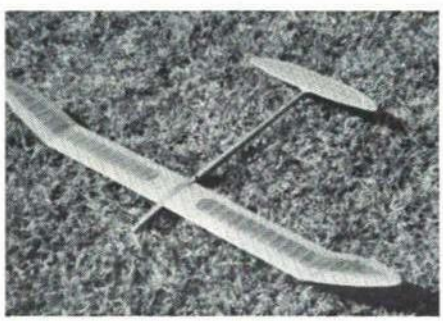
Crane's design was asymetrical in that the wing, with tip dihedral, flat center span, was mounted 2" off center. Wingspan projected is 31", 6" chord, elliptical tips. Stab, elliptical, is 16½" x 4½". Wing airfoil is 6% cambered at 40% of chord — stab airfoil similar to wing. Prop, a Hacklinger type was of 18" diameter, 33" pitch, mike covered. Rubber was Pirelli, a 17" loop .07" x .04", Micro X lube.

Model constructed of Microdyne balsa, Micro X cement, Microdyne microfilm, dacron bracing. Strong contruction allowed "scrubbing" the low ceiling for 10 minutes each flight, which wore out prop tips. Model weighed .05 ounce without rubber.

Indoor HL Glider national AMA record, Ceiling Cat. II, Open age class: 2 minutes, 10.6 seconds, established by Donald A. Reed, Springfield, Pa., on August 4, 1968.

Reed's model was a modified Sweepette 18 from Zaic's Yearbook. It had polyhedral wing and a flat stabilizer, weighed .35 oz. Length of fuselage from nose to wing L.E. was 4", 3¼" center wing chord, 9" from wing T.E. to stab L.E., 2½" stab center chord. Wingspan 18", stab span 6". A length of .015" wire was affixed to the wing leading edge to help prevent nicks. The wing was finished with one coat of sanding sealer to about the 70% point, none on the trailing edge. The model was built from Sig contest balsa.

FF A-1 Towline Glider national AMA record, Senior age class: 17 minutes, 14 seconds, established by Gary Myers, Miami, Fla., on October 6, 1968.



Design of model was by John Arthur. Wingspan 52", major chord 4¾"; stab span 17½", center chord 3½"; underslung vertical fin. The model weighed 5¼ ozs.

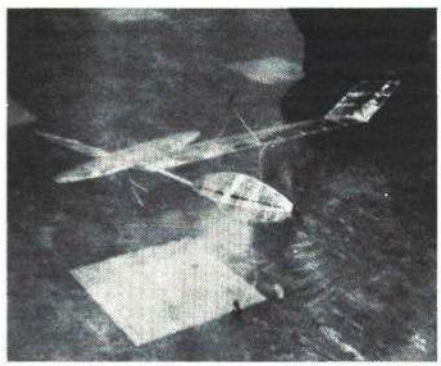
Sig balsa and Super-Modelers cement was used in construction. Covering was Jap tissue, Aero Gloss dope.

FF Unlimited Rubber national AMA record, Junior age class: 27 minutes, 54 seconds, established by Gary Heeb, Xenia, O., on August 8, 1968.

Another design by Frank Heeb, the Stratomax, is a modification of the Stratowake, but it uses a 22" dia. x 24" pitch prop and 12 strands of ¼" Pirelli rubber, 34" long. Like Gary's Wake, this model also used Sig tissue, Sig dope, Sig lube, and Sig dethermalizer fuze. Model weighed 6 ounces.

This record also was set at the 1968 Nats in regular competition — beat all Seniors and Opens.

Indoor B Cabin national AMA record, Ceiling Cat. I, Open age class: 7 minutes, 33 seconds, established by Thomas Vallee, Laurel, Md., on September 28, 1968.

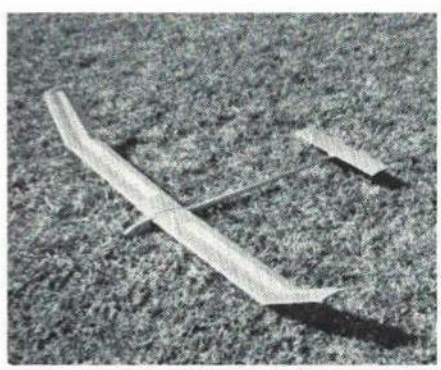


This .04 oz. model of Vallee's own design was constructed of Micro-Dyne indoor spar stock (prop spar from 3/32" Sig contest balsa), covered with Micro-Dyne microfilm (blue), much wire bracing. Airfoil of the 27½" wing, 3.75" chord, was a smooth curve of .25" thickness, high point located at 40% of chord. Similar airfoil for the 12" x 4" stab. The wing was mounted off-center to create a tight circle. Stab tilt also was used.

Power for the 13" x 22" prop was supplied by a 13" loop of .04" x .055" Pirelli, lubed with a glycerine-soap mixture.

Vallee indicates the model was designed specifically for the Cat. I ceiling — short fuselage and relatively long tail boom. On the record flight, the model struck the outside wall above the floor — losing a potential extra minute.

FF A-2 Towline Glider national AMA record, Senior age class: 19 minutes, 27 seconds, established by Gary Myers, Miami, Fla., on October 6, 1968.



The design by the record holder weighed 15 ounces; had 52" wing, 4¾" chord; 17½" stab, 3½" chord. Wing airfoil was the NACA 6409. Materials used in construction same as Myers' A-1 record model.

Indoor C Cabin national AMA record, Ceiling Cat. I, Open age class: 9 minutes, 42.4 seconds, established by Harold Crane, Hampton, Va., on September 28, 1968.

Crane used an original design dubbed "Old Timer," swinging a 16.5" x 30" mike-covered prop, off-center wing, tilted stab. Model weighed .08 oz. without rubber, which was two strands of Pirelli, 15" long, .085" x .04", Micro X lube, 1400 winds. Projected wingspan was 27¼", 5 31/32" major chord.

Model was built from Micro Dyne balsa, Micro X cement, Micro X microfilm. Take-off gear used a single strut, two wheels joined together with a railroad-type axle.

Once Over

Continued from page 47

Delaware Club Correction

The listing of AMA chartered clubs in January AMA News has proved to be very useful, many members write. An error was discovered, however. Bill Northrop should have been listed as the contact for the Delaware RC Club, 56 Holly Lane, Newark, Del. 19803.

New NFFS Director, Editor

By a unanimous vote of the National Free Flight Society Board of Directors, Chuck Broadhurst, 3818 El Ricon Way, Sacramento, Calif. 95825, has been elected new NFFS Executive Director. He replaces Mike desJardins, who retired. By a similar vote, Bill Gieskieng, 1333 South Franklin St., Denver, Colo. 80210, has been elected editor of NFFS's *Free Flight Digest*, replacing Walter Rozelle. Both promise to bring renewed vigor to the society.

Expert Defined

Be careful about calling yourself an expert, says *Condenser*, **newsletter of the Alamo Radio Control Society, San Antonio, Tex. "An** *ex* **has been defined as a** *has been* **and a** *spurt* **as a** *drip under pressure*."

BIRD — G.G. Challenge

The B.I.R.D. Club of Signal Hill fought it out with the Garden Grove RC Club in a unique challenge contest which featured Bomb Dropping, Carrier Landing, and Team Relay. This was no small event considering that entries ran 55 for the flour bomb event, 53 for carrier, and 12 teams for the relay. Points were awarded for attending the challenge (even if without an entry) as well as for placing in the events. The BIRDs were the victors by a narrow margin of 97 to 89.

More on '69 FAI Team Race Rules

In March AMA News the addition of 100-lap semi-final races for FAI CL Team Racing World Championships was announced; such races will be used to determine the three teams in the Finals. Placing beyond third will be determined by the flight times in the elimination races, not semi-final placing.

Three other changes enacted at the November CIAM meeting, which affect AMA contests which schedule FAI TR events as TR WC's, are as follows.

The model pilot head must have minimum dimenions of 20 mm (.79″) high, 14 mm (.55″) long, 14 mm wide.

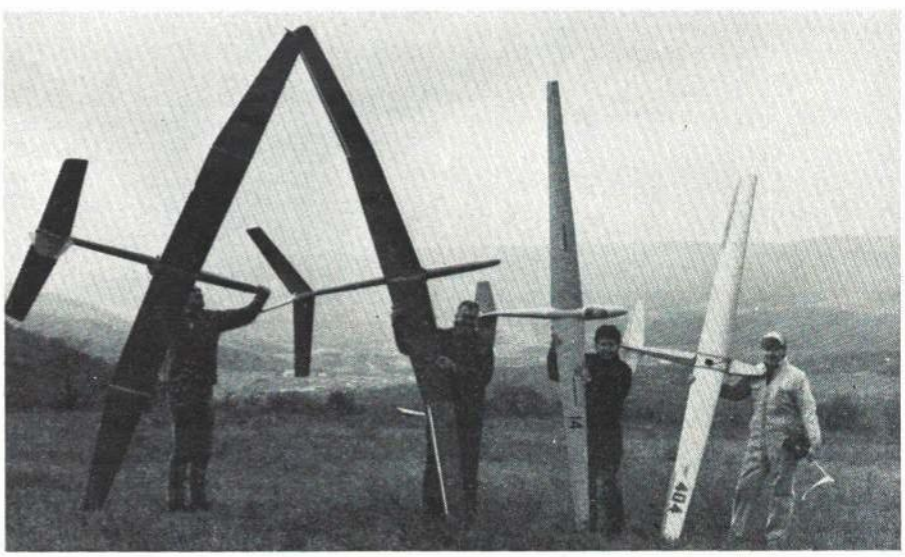
Mechanics must wear a head gear "strong enough to withstand a collision with a flying TR model."

The radius of the flight circle (not line length) is increased from 19 to 19.6 meters. During refueling the model centerline must be outside the flight circle.

Photo was taken during a working session of the FAI Committee for International Aero Modeling (CIAM) last November. Many famous international modeling figures shown.

Two presidents with a common interest: Sandy Pimenoff of Finland (L), new president of the FAI Committee for International Aero Modeling (CIAM) discusses the art of slope soaring with John Patton, AMA president. Pimenoff was flying Patton's RC glider on a mountainside near Frederick, Md., during a visit to the U. S. last October. He stopped by AMA HQ during the tour.

Above: Tom Rankin, Silver Spring, Md., chairman of the AMA RC World Championship Team Selection Committee (for the 1971 WC) holds the 14-ft. RC soaring glider designed and built by Ray Smith (at nose of model) of Washington, D. C. Special glider is for FAI altitude record attempts in standing-wave created in mountains near Cumberland, Md. Below: The group trying for the altitude record last November. Tom Rankin is on left, Ray Smith next — both with Smith designs. Next is Maynard Hill with a Nelson KA6 glider, and on the far right is AMA President John Patton with a 10-ft. span glider. Great soaring was found, but no records were broken.



AMA News Extra .....

1969 FAI CONTROL LINE PROGRAM TO SELECT 1970 USA WORLD CHAMPIONSHIP TEAMS

Basics--At least twenty flyers in each of three event categories--Stunt, Speed and Team Race--plus the 1966 and 1968 teams for each category, will be qualified to fly in the finals to be held at St. Louis over the 1969 Labor Day weekend. The three top flyers in each category at the finals will make up the next USA team to the world championships, currently scheduled for Holland in 1970.

Awards--In addition to the team positions, special FAI trophies will be given in each category: one to each of the top twenty flyers who qualify for the finals. Sponsors for these awards are: K & B for Speed, Top Flite for Stunt, World Engines for Team Race.

TWO WAYS TO QUALIFY

1. Via ten designated AMA meets at which the highest placer in each of the FAI event categories, who is entered in the team selection program, will be automatically qualified for the finals. FAI rules will be used in these events.

2. Via other AMA meets. At least ten flyers entered in the team selection program who have recorded the highest performances in each category, no later than August 10, 1969, will be qualified for the finals. Meets may be special FAI team selection meets for this program, or regular AMA meets with appropriate control line events; either type to be AMA sanctioned as per normal procedures.

THREE WAYS TO ENTER

1. In advance, by submitting qualification fee directly to AMA HQ.
2. At any of the ten designated meets
3. At any AMA sanctioned FAI CL qualification meets.

Entry fees--$5 per person for Open AMA members, $3 for Seniors, $1 for Juniors. Once payment of the qualification fee is made the contestant may attempt to qualify or improve his qualification score at as many meets as he chooses to attend, within the program time period, without further payment of qualification fees. There will be a finals fee of $10 per person. Note: there may be entry fees at various meets, particularly where prizes are given (such as at regular AMA meets)--these are not involved in the team program but may be required in order to enter the contest. Program entrants will receive and must use official performance forms for reporting qualification scores to AMA HQ.

Who can enter--any U.S. citizen who has paid for a 1969 AMA membership card and FAI stamp prior to making his first flight in the program, and who will be at least 14 years old by June 1, 1970.

SPECIAL RULES

1. Speed. Model must be flown with FAI fuel. No monoline--two line system with each line at least .012" dia. must be used. Best single flight to determine placing on finals qualification list.

2. Stunt. For Stunt, in either FAI or AMA meets (other than the ten designated meets), AMA rules scoring will be used to determine finals eligibility. Note: only flight points will count toward qualification--no appearance points (although latter may apply toward contest placing).

3. Team Race. Team must fly in accordance with FAI rules for line length and size, tank capacity, pit technique. Model must be flown in race conditions--with two others to start the race and with at least one other still flying at the completion of 50 laps. The other models need not meet FAI model or flying specifications. Qualification time will be based on 100 laps. Best single race to determine placing on finals qualification list.

4. General--all models entered in the program must meet FAI specifications. See AMA rule book for details. Contestants will be responsible for submission of performance to AMA HQ, must be postmarked no later than August 11, 1969.

Finals--site is Buder Park, St. Louis. FAI rules and world championship procedures will be in effect.

Program Administrator--Steve Wooley, 821 4th St., Marietta, Ohio 45750.

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.

ATTENTION: NATS dates now confirmed as July 14th through 20th — no weekend full scale airshow.

DIRECTORY OF AMA OFFICERS

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

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VII: Odell Marchant, 2004 N. Hillsboro, Minneapolis, Minn. 55427 (North)
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Pete Brandt, 5817 W. Ironwood, Palos Verdes Peninsula, Calif. 90274 (South)
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Bold type below indicates Chairman of Contest Board.

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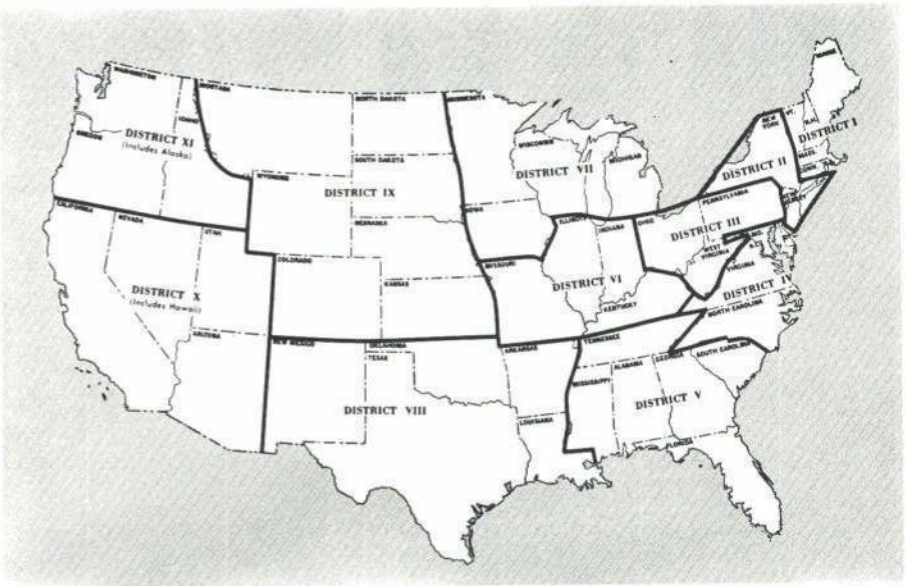
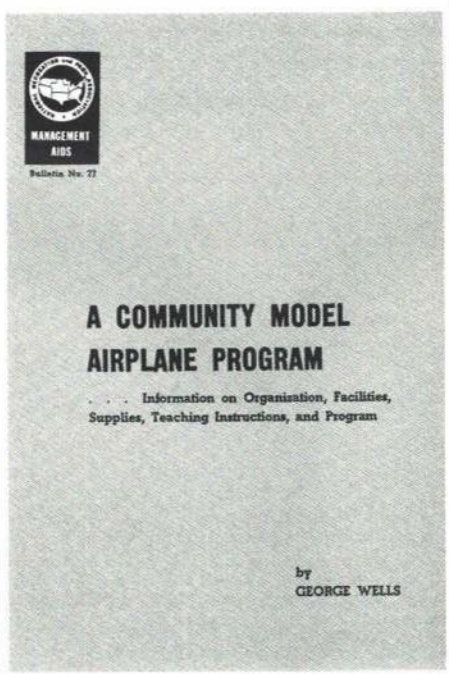


New Booklet Provides Tie Between Modelers and Public Parks

A Community Model Airplane Program, a new booklet produced by the National Recreation and Park Association, has a significance far beyond what the booklet pages suggest, for it indicates an endorsement of model aviation activities by recreation officials. This is opening doors to model airplane activity in many new areas.

In Philadelphia, for example, there is now serious planning to introduce model airplane flying in the city parks and recreation areas. Recreation department officials there have indicated that the NRPA endorsement was a key factor in their becoming interested.

Similarly many civic officials have become interested in model airplane activities as a result of the booklet. In effect model aviation is being increasingly recognized as a respectful activity for community support. The possibility of new flying sites being created has been greatly enhanced by the availability of the booklet.



The NRPA booklet is one of the most outstanding achievements of AMA's Junior efforts. AMA has worked closely with the NRPA staff in its production for a year and a half.

As in the Philadelphia case, the most effective use of the booklet is by local modelers using it as a means of strengthening their requests for community help in establishing a model airplane program on city property. Particularly interesting is the fact that RC clubs are able to make a better case for community help by using the booklet to show the relationships between elementary, Junior, and more advanced forms of modeling. In other words, by embracing the youth aspects of model aviation, along the lines of the booklet, their own adult activity is more favorably received as part of a legitimate recreational program.

Basically the booklet is a communications link between modelers and civic officials. It gives community people something for their files which justifies the spending of funds or use of public property for model airplane purposes. Clubs and modeling leaders are, therefore, advised to use the booklet to support efforts for community assistance. It is especially helpful to leave copies with key officials.

While copies of *A Community Model Airplane Program* have been provided to AMA chartered clubs, it is recognized that others may find the booklet useful. Additional copies may be obtained from AMA HQ for $1.00 each.

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

Feb. 15-16 — Tulsa, Okla. Outdoor FF Record Trials.. Sites: TGD Field. B. Hanford CD, 3838 S. 88 E. Ave., Tulsa, Okla. 74145. Sponsor: **Tulsa Glue Dobbers.**

Feb. 16 — Lincoln Park, N. J. (AA) 9th Annual Snowbird Challenge Meet for CL. Site: Club Field, Two Bridges Rd. A. Cangialosi CD, 131 Horseneck Rd., Fairfield, N. J. 07006. Sponsor: **Garden State Circle Burners.**

Feb 22-23 — Buckeye, Ariz. (AAA) 19th Annual South Western Reg. Model Airplane Championships for FF, CL & RC. Site: Mun. Airport. E. Dolby CD, 1112 W. Mission Lane, Phoenix, Ariz. 85021. Sponsor: **Phoenix Model Airplane Club.**

Mar. 22-23 — 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.

Apr. 19-20 — Contest for RC. B. Gale CD, 811 9th Ave. S.W., Puyallup, Wash. 98371. Sponsor: **Mount Rainier RC Society.**

Versapulse Transmitter

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be deleted, simply delete the associated components. CR1, CD1, pilot bulb 1, and the leads from F and G are required for transmitter charging. CR2, CD2, pilot bulb 2, and PL2 are required for receiver charging.

The following precaution is very important: Before charging either your airborne or transmitter pack, check the charging rate by inserting a millimeter in the positive lead to the individual pack. If the charge rate exceeds the recommended rate, cut land F (for the transmitter pack) or land H (for the receiver pack) and install a potentiometer across the cut point temporarily. Adjust this potentiometer for the correct charge rate, measure resistance setting, and replace with the nearest-size fixed resistor. These resistors are shown in Fig. 6 as Rx.

Charge rate for the 9V transmitter pack without Rx will be about 45 milliamperes. Receiver pack charging rate will be about 50 ma for a 4.8V NiCad battery pack. Remember, this circuit involves 110 volts so don't put your fingers in the transmitter at any time the line cord is attached.

Final assembly:

a) Strip ¼" from the end of the leads soldered to the PC boards earlier, tin, and solder the leads using the wiring and layout, Fig. 9. The battery leads go to lugs 3 and 4 of the DPDT on-off switch and the location and color coding of the leads are identified in Fig. 6 and on the PC boards. The lever switch shown is identified as SW-2 on Fig. 4. The transmitter case, upon which the components will be mounted, is bent from light gauge sheet aluminum. The front case layout is shown in Fig. 7. The back cover is simply a U-shape, 7¾ x 6½ with 2⅜ flanges.

b) Mount the RF section with four 4-40 binder head screws as follows: Insert each screw through the case, put a washer over it, and run a 4-40 nut down tight. When all four screws are in place, slip the RF board over the exposed ends of the screws and run nuts down at each corner. Check to be sure no solder joints are touching the case.

If in doubt, apply a layer of vinyl tape to the transmitter case behind the RF board. Mount the 0-1 ma meter. Solder the leads from X and Y to the meter with the red lead from X going to the plus pole of the meter. Mount the antenna connector (don't forget to insulate from the case with fiber washers provided) with antenna lug attached. The antenna used was a center-loaded antenna from Ace Radio Control. Lafayette radio also markets a suitable center-loaded antenna which has been used.

c) Mount the stick assembly. This will position the pulser/audio board as it should be if the chargers are not included. If the chargers are used, the following procedure applies:

Mount the stick assembly on the transmitter case with pots in place. Mount PL1 and PL2 at the bottom of the case as shown. Carefully bend 90 and solder *all three* of each pot lugs to the proper lands and the pins on PL1 and PL2 to their respective lands. The assembly now may be removed from the case and each joint "heavied up" a bit, then the assembly can be placed permanently.

Checkout:

a) Connect a 9v battery to the leads from lugs 3 (+9v) and 4 (—9v) of the on-off switch. Position the control and adjustment pots at the following initial settings:

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model rocketeer

NATIONAL ASSOCIATION OF ROCKETRY

1239 Vermont Avenue NW, Washington, DC 20005

ANOTHER TENTH ANNIVERSARY

Ten years ago this month, the then newly formed NAR was officially represented at the First World Congress of Flight, Las Vegas, Nev., held April 12-18. It was there that NAR officials made their initial contact with the National Aeronautic Association. NAR became affiliated with NAA on April 3, 1961.

EDUCATION MATERIALS AVAILABLE

If you are an educator with a school or NAR Section, you'll be interested in obtaining the special kits made up by two model rocket manufacturers. We were privileged to review these kits assembled by specialists working with Estes and Centuri companies; both seem prepared for the educator who would add model rocketry to the classroom for science projects or use certain technical reports and related materials in NAR Section classes/workshops. Write to Estes Industries, P. O. Box 227, Penrose, Colo. 81240 or Centuri Engineering, P. O. Box 1988, Phoenix, Ariz. 85001, attention of the public relations director, for your copy. Note: Educator kits are not designed for the average person to use individually; we suggest you present some background information on your class/section and how you plan to use the kit.

SOMETIMES THE GOING'S ROUGH

According to NAR senior members in the Houston, Tex. area, the going can get rough. A recent example is that three sections in that area draw on NASA's Manned Spacecraft Center for senior help, namely the Apollo-NASA, Bellaire, and Spacers sections. When NASA was cut in both the funds-personnel areas, and also geared up for Apollo missions, work was increased and NAR senior help became scarce. But this is the time when senior advisors (not necessarily NAR members-parents) and NAR leader members have to tackle leadership positions.

Mark Evans, of course, was the spark plug in the Houston area who got the first section off the ground. Other help came from college-man Ronald Fink, who organized the Bellaire Section in the Southwest part of town.

The fact is that all three sections, including the Apollo-NASA group in NW Memorial suburb, and the SE Clear Lake group, have full NAR sanction and charters which only have to be renewed. So, with some extra effort in organization, planning, etc., these sections can continue their meetings, schedule local and area-region competition in Texas, and start now to qualify for the '69 Nats.

Rocketeers in the Houston area can call Bob Jones at 946-7078 or Chuck Biggs at HU-3-4241, who are with NASA and have agreed to locate the closest NAR Section for persons who want to join.

The above information was presented as an example of actions that happen within certain sections, indicating the need for

Continued on page 56

Members of the Annapolis Assn. of Rocketry (AAR) demonstrated how to sell the NAR by manning a booth at the Greater Annapolis Science and Technology Exposition in November 1968. Show is sponsored annually by the local Chamber of Commerce and draws thousands of visitors. As a result: AAR membership has grown from about 15 to 40 in one month!

Giant B-52

The size of this bomber kit offers great detailing possibilities with Viet Nam camouflage or SAC colors.

RICHARD MARMO

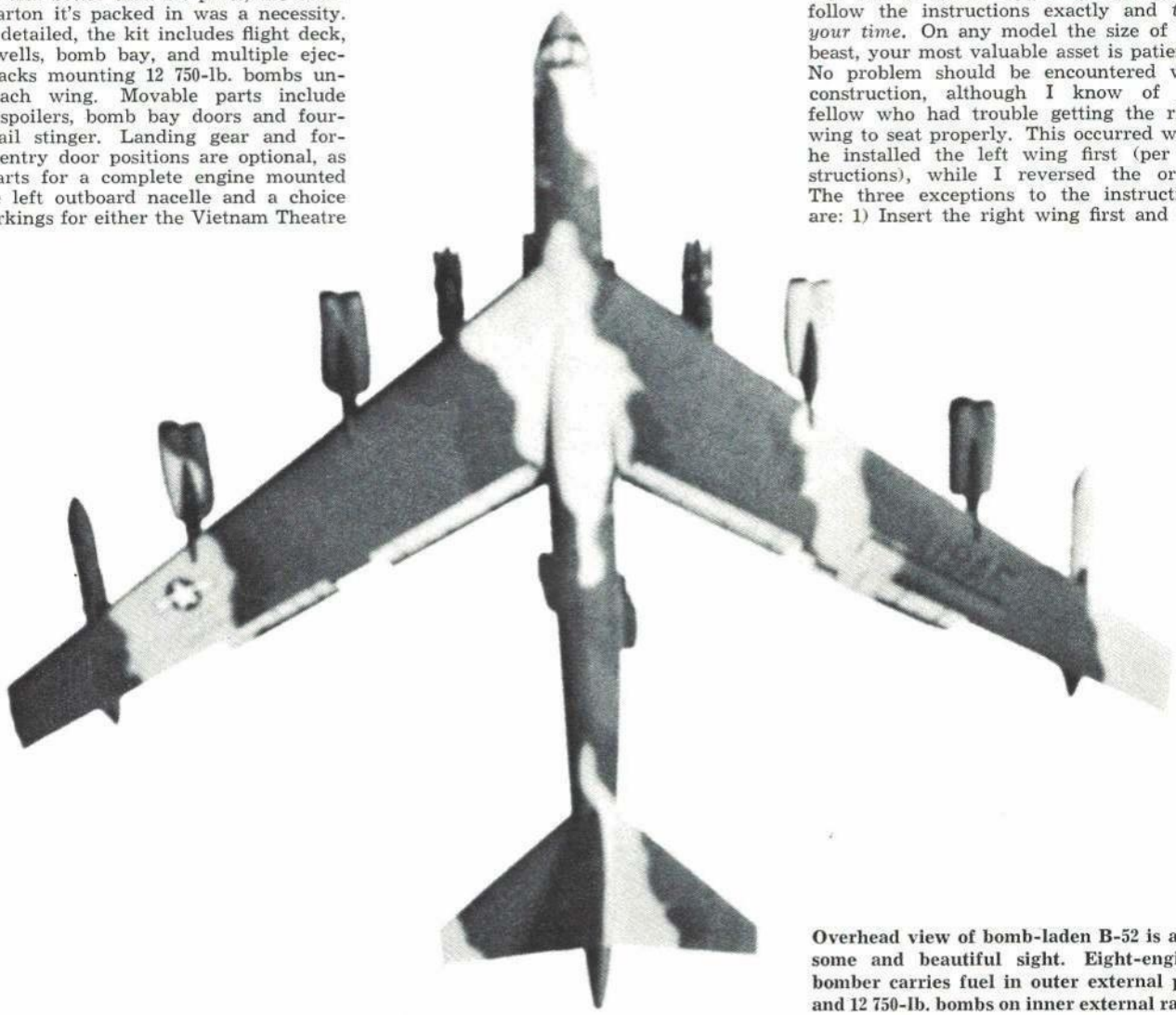
WHENEVER the aviation industry produced an aircraft larger than any built to that time, the inevitable comment was that they'll never build 'em any bigger. And just as inevitably, within a few years time someone does just that — builds a bigger one.

In the same way, history has dealt with Airfix's 1/72 Boeing B-29. The new holder of "the world's largest 1/72-scale plastic aircraft kit" is the superlative Boeing B-52 by Monogram Models. And, as if size alone wasn't enough, the kit will take a $15 bite out of your wallet when you go to buy one.

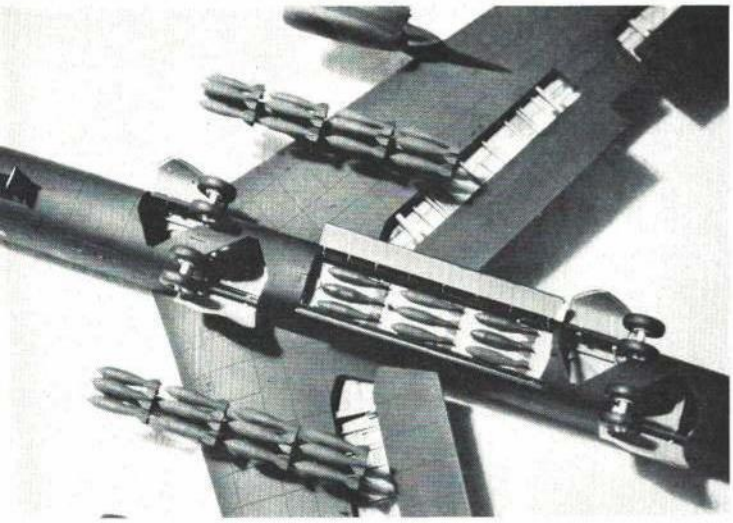
With a wingspan of 31", fuselage length of 28", and better than 220 parts, the oversize carton it's packed in was a necessity. Fully detailed, the kit includes flight deck, gear wells, bomb bay, and multiple ejection racks mounting 12 750-lb. bombs under each wing. Movable parts include flaps, spoilers, bomb bay doors and four-gun tail stinger. Landing gear and forward entry door positions are optional, as are parts for a complete engine mounted in the left outboard nacelle and a choice of markings for either the Vietnam Theatre or U. S.-based SAC bird. Thrown in for good measure is one out-and-out gimmick — jet sound. This little rig consists of a Mabuchi motor, housed within a blower-compressor assembly, and the sound it produces is reasonably realistic. Power comes from four 1½-volt batteries. Alkaline batteries are recommended despite their added cost (50c each vs. 20c for conventional batteries). The battery case is housed in the bomb bay, and is concealed by a plate on which is molded nine 750-lb. half bombs.

On the whole, it's an excellent and accurate kit, although it does present some problems. First of all, crew seat construction is such that you will be forced to use the figures provided. This is strictly a personal thing, but if you don't normally include the crew in your models, it can be irritating. (It is not clear why to us, because figures would seem a big plus — Ed.) According to the Information Office of Carswell Air Force Base, the cockpit should be a gun-metal gray. I used Floquil's Primer gray to represent this. The crew should have sage-green flight suits, with white helmets, black boots and gloves, and black oxygen masks. I painted the helmet visors a dark blue. In addition, the bombs should have a yellow band around their nose (which I did not add because of time limitations).

With three exceptions, the best advice that can be given regarding assembly is follow the instructions exactly and *take your time*. On any model the size of this beast, your most valuable asset is patience. No problem should be encountered with construction, although I know of one fellow who had trouble getting the right wing to seat properly. This occurred when he installed the left wing first (per instructions), while I reversed the order. The three exceptions to the instructions are: 1) Insert the right wing first and fol-



Overhead view of bomb-laden B-52 is awesome and beautiful sight. Eight-engined bomber carries fuel in outer external pods and 12 750-lb. bombs on inner external racks.



Model displays many details: wing interior landing gear assemblies, external bomb racks, and loaded bomb bay.

Detailed parts masked and flaps retracted for camouflage spray-painting. Two-color top-side, dull black under-side and rudder.

low with the left. 2) Install the bomb pylons per instructions but leave the bombs off till after the model has been camouflaged. 3) Leave the gear doors off till the fuselage has been painted black.

You might also save yourself a little trouble by spraying the gear struts silver prior to assembly and masking them before general painting.

Vietnam Theatre camouflage is the standard tan, green and green three-tone uppersurface. But instead of the usual light gray undersurface, the B-52 uses black for the undersides, extending ¾ of the way up the fuselage sides and for the entire vertical fin. Instructions specify gloss black, but several people I've talked with say all B-52's they've seem carried flat black.

Several companies make camouflage paint sets, including Testors and Official. Testors give you eight of their ¼ oz. 15c paints plus a bottle of thinner. Unfortunately, Testor's set is useless as far as the three-tone uppersurface goes. I haven't had a chance to use the Official set, but their WW II colors I've used were bang on.

Getting to specifics, I used Pactra's Light Earth spray for tan, with home-brew mixes of Pactra and Testors for dark and light green. Floquil's Engine Black was used for the underside. Zinc Chromate for the bomb bay, gear and flap wells was mixed by adding a small amount of black to Floquil's Chartreuse. If you prefer, Pactra's Scale Model Flats have an excellent Zinc Chromate available. The brown for the radomes was Testor's #1166 Military Brown. Incidentally, on a model this size, the preferred method of painting would be an airbrush or spray can.

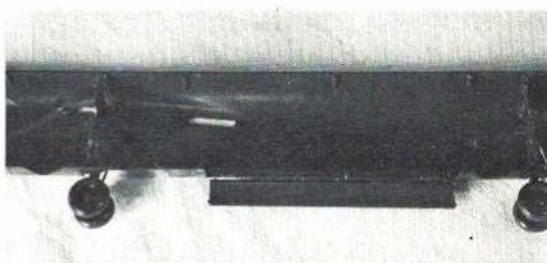
Whether or not the red wingwalks exist on the camouflaged ships (as shown on the paint diagram) depends entirely on who painted the aircraft and if they were in a hurry. Because of this, and to simplify things, I left them off. If you do add them, be sure you apply them only to the left side of the vertical fin, as the fin was designed to fold to the right.

Decals are high quality, although I had some problems with clear areas clouding (as you can see in the photos). Also, the background blue for the SAC emblem was much too light. However, I was told this would be corrected in production kits.

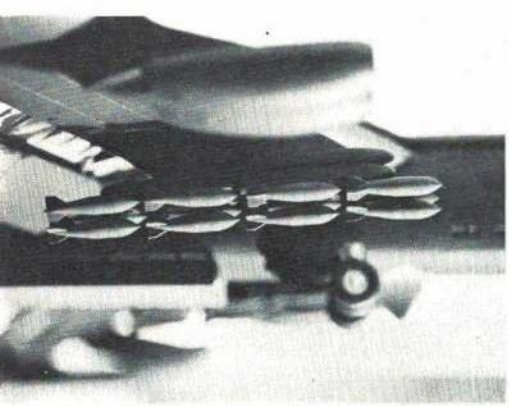
All indications are that Monogram's B-52 is selling well, thus shattering both size and price barriers. So what's next in the new, giant kit parade? A 1/72-scale B-36J, maybe?

Editor's note: The Strategic Air Command's museum at Offutt AFB in Omaha, Neb. has on display a model of the B-52D built by Monogram Models exactly like the model in this article. Mr. Joseph Ballinger of Monogram presented the camouflaged beauty to Colonel E. A. Crouchley, Base Commander, Offutt, AFB. Almost as detailed as the full-size plane, this model appears in a display case beside a real B-52 and, being a model, is easier to appreciate.

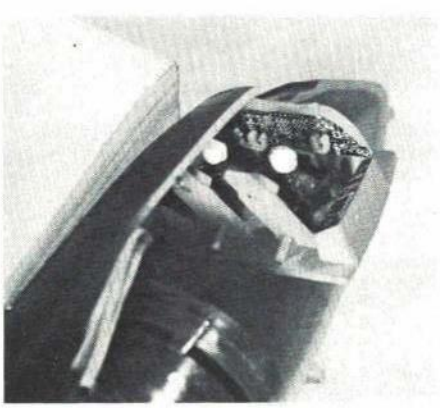
Paint the tail gunner same as pilot. Don't get overspray on gunner when camouflaging.



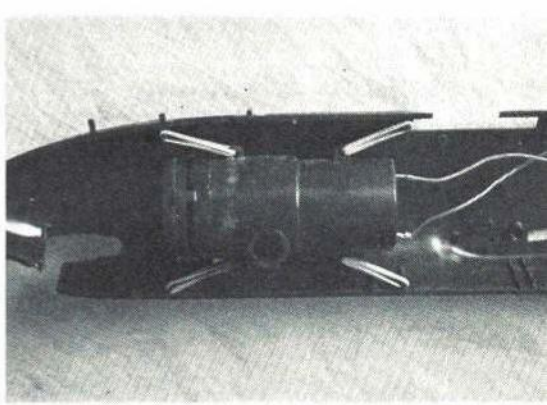
Paint LG legs and tires before mounting. Many steps precede joining fuselage halves.



Glue external bomb rack before camouflaging, but paint and mount bombs on it later.



Pilot and copilot are molded as part of their ejection seats. Cockpit has lots of detail.



The out-and-out gimmick is quite realistic electric motor, driving blower-compressor.

Continued from page 53

Pot #	Designation	Initial Position	Effect of Clockwise Motion*
1	Rate control pot	30 from full CCW	Decreases rate
2	Broad rate trim — lo rate	Mid	Increases rate
3	Broad rate trim — hi rate	Mid	Increases rate
18	Broad width trim	Mid	Gives right trim
19	Width control	75 from full CW	Gives left width control
20	Width sensitivity	Full CCW	Decreases sensitivity
27	Tone frequency	Not critical	Increases frequency

*Viewed from back of transmitter, switch #9 is hi-lo pulse-rate selection. For initial tests, select low rate.

b) Turn transmitter on. Key the hi-lo-motor lever switch to low. Adjust the slug of L2 (Item #10) on the RF board for maximum meter reading.

c) Release the lever switch and observe the meter. If the pulser is functioning, the meter will swing slightly at the pulse rate and average up or down with width change. High motor (full signal on) will give a lower than average meter reading, and low motor (full signal off) will give a higher meter reading. This is because the meter indicates RF output and RF output gives an apparent higher reading when there is no modulation.

d) Operate the system with your airborne system. Adjust for desired neutrals and sensitivity without disturbing control pots 1 and 19. Note that there will be a slight change in neutral as sensitivity (20) is changed, which may be nulled by adjusting 18. Switch 9 will give rate selection appropriate for Galloping Ghost and magnetic actuators at "Low" setting and Simpro, Rand Pak, etc., at "High" setting. Minor adjustments of rate and width in going from one system to another are made with 2, 3 and 18.

Model Rocketeer

Continued from page 53

back-up assistance such as member-parent help so programs may continue. Also, be sure and send in your section calendar of events three months in advance so the Rocketeer can publicize launchings/demonstrations, etc., in your area.

NEW SECTIONS FROM COAST TO COAST

Several new sections have been added to the NAR rolls. California has reported two new groups; Texas has one, and on the East Coast, one each in Maryland, New York and Maine. Our next issue will have a complete listing of the 34 sections active in Aug. '68 plus the new sections.

The most recent chartered sections are:

Titan Section (WCMRS)
(West Covina Model Rocket Society)
1444 W. Garvey Ave., West Covina, Calif. 91790

Loma Valley Rocket Pioneers
P. O. Box 26
Browns Valley, Calif. 95918

Continued on page 58

The Winder

Combat Control Line Champion of Champions

The hottest one! The experts say the Winder is "the best combat flying model ever!" Terry Prather, the designer, has incorporated new design features in the Winder that make it incredibly maneuverable . . . at speeds in excess of 120 mph. Space just does not permit showing all of the trophies the Winder has won, in contest after contest . . . including First Place at the Nationals! Now Sterling makes this prize winning 42½" whirlwind available in kit form.

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"
Kit S-33
$4.95

Messerschmitt ME 109

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

S.E. 5a

Remarkable scale realism! 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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☐ Catalog of entire line of airplane control line model kits, R/C scale & Trainer kits, boat model kits, accessories; etc. 10¢ enclosed.

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Academy Street South
Berwick, Maine 03908

Long Island Rocket Society
75-31 193 St.
Flushing, N. Y. 11366

Wicomico Aerospace Section
RT #4, Windham Court
Salisbury, Md. 21801

Saturn Model Rocketry Section
975 Gloria
El Paso, Tex. 79907

FIRST WORLD MR MEET 1970

The following news release from G. Harry Stine, Chairman, NAR Liaison Committee, who attended the 1968 CIAM meetings, is quoted for the information of all rocketeers:

"In a move unprecedented in the annals of international aeromodelling sport, a world championships competition for model rocketry was approved only two years after official international competition rules were adopted and only six years after the initial presentation of model rocketry was made to an international body.

"On November 23, 1968, the International Aeromodelling Committee (CIAM) of the Federation Aeronautique Internationale meeting in Paris approved the bid of Yugoslavia for hosting the first World Championships in Model Rocketry at Vrsac, Yugoslavia, in 1970. Exact dates have not yet been established. Authorized for the meet are competition events in the categories of flight duration with a parachute, flight duration with a rocket glider (boost/glider), and scale models. (The scale model rules were also adopted at the same time as the approval for the World Championships.)

"The World Championships will be held under the international model rocketry rules of Part 4b of the FAI Sporting Code. Each nation will be permitted to send at least one team made up of three model rocketeers and a team manager; more teams can be entered if desired.

"The Federation Aeronautique Internationale is made up of over 60 nations and has international jurisdiction over all aerospace sport ranging from certifying flight records in astronautics to establishing rules for international competition in parachuting, aerobatics, ballooning, gliding and soaring, distance and speed records, model aircraft and model rockets. The governing body for aeromodelling is the CIAM of FAI.

"Model rocketry was first presented to CIAM in 1962 by G. Harry Stine of the USA. A rocketry subcommittee was formed to draw up proposed sporting competition rules. These rules were adopted on a pro-

vision basis by CIAM in 1964. When 1966 rolled around, the first international competition (but not a world championships, which is a different contest category) was flown at Dubnica, Czechoslovakia and the rules were adopted as official in Paris later in the year.

"Nations currently engaged in model rocketry include Sweden, Belgium, Czechoslovakia, Poland, East Germany, Hungary, Bulgaria, Yugoslavia, Canada, Australia, the U.S.S.R. and the United States."

Mr. Stine gave credit to USAF and the Military Airlift Command (MAC) for making it possible for him to attend the CIAM sessions. He reports all recommendations were adopted by the CIAM and in most cases, only those nations having model rocketry voted for items, the remainder abstaining.

CIVIL AIR PATROL LAUNCHES MR PROGRAM

In December, USAF's Larry Loos, NAR #7127, visited CAP National Headquarters at Maxwell AFB, Ala. to review the model rocket program and present a new version of a draft manual. He reports that CAP aerospace education officials under direction of Jack Sorenson had recently finished a draft manual to be printed soon.

Larry reports that CAP squadrons will be encouraged to form NAR sections within their cadet units, being officially chartered and holding competition with local, state and national meets each year to determine the best CAP rocketeers. Naturally, CAP units need extensive help from NAR members and sections to get their own programs off the pad. At the same time, they will arrange competition with NAR sections to stimulate continued interest.

From an NAR standpoint, we stand to gain thousands of more dedicated members in areas never thought possible in the U. S. But again, just as NASA worked closely and in harmony with industry and military to reach their present success with Mercury, Gemini and Apollo, we can do much to assist CAP cadets get started in our aerospace hobby/sport.

CAP, which passed its 27th birthday Dec. 1, '68, has quite an impressive record of firsts with youth aerospace education and aviation programs in addition to their search and rescue programs. Larry, a USAF-CAP veteran member, noted that programs accepted by CAP are thoroughly researched and tested before approval is granted. His prediction at year's end was that within several years NAR could be made up of half membership representing CAP in the U. S.

YOUR 1968 MR-CD GUIDE

Here's a brief, handy-dandy guide to the

most important items which appeared in The Model Rocketeer column during 1968 — plus the subject of Countdown features through October.

Jan. — AUAA Approves Model Rocketry; New Sporting Code Rules and Quadrathon Event Discussed. CD — Special NARAM-9 Report.

Feb. — VP Humphrey Lauds NAR; New Officers & Board of Trustees plus addresses; 44 NAR Sections and Addresses. CD — In's and Out's of Scale.

Mar. — Certified Engine List of Approved Companies. CD — Model Rocketry Goes Metric.

Apr. — Review of Legality of MR with Definitions, History, etc. CD — Nike Smoke Sounding Rocket for Scale Buffs.

May — Wash., D. C., Calif. and Houston area Model Rocket Sections. CD — Low-Drag Design.

Jun. — NARAM-10 Planning Complete. CD — Scale Tips & Techniques.

Jul. — Contest Guide; Pittsburgh Convention; New Editor for column. CD — All About the Sporting Code, Record Attempts, etc.

Aug. — Sporting Code Revisions on Contests and Events; 34 NAR Sections & Addresses. CD—Two Lively Conventions, Pittsburgh and M.I.T.

Sep. — NFPA Approves Model Rocketry Code. CD — Honest John for Scale.

Oct. — CD Only — Polish Boost-Glider.

Nov. — Column Policy Set; Standards and Testing Committee Defines Newton Seconds and Egg Lofting. CD Column Officially Discontinued.

Dec. — Lock up Those Countdown Features; Convention Reports; Suggestion for R&D Project; Saturn V Apollo Plans from NARTS Available.

Scale Techniques

Continued from page 31

light blue on under surface. 3) Pale sky-blue on all undersurfaces — wings, elevators, bottom of main and outrigger floats. (This is the color scheme used on my model.) All aircraft had a yellow stripe along the leading edge of the wing, extending from wing root to about one-half the length of the leading edge and about 4" in depth, top and bottom. Some of the Rufes had the radio mast protruding from the rear of the cockpit enclosure.

Preliminary procedures: Check contents of kit for missing parts. Wash in lukewarm detergent suds to remove mold release, then allow to dry thoroughly. Use fine-mesh metal strainer so that small parts are not lost. While drying, assemble all reference material: photos, pictures, etc.

CARL GOLDBERG

THIS MONTH IN THE SPOTLIGHT

CG STEERABLE NOSE GEAR

This is the low-priced surprisingly simple and sturdy unit that has been so successful on the Sr. Falcon and Skylane 62. It has a steering arm with a shock-absorbing spring that prevents damage to the servo, yet never slips to cause misalignment. The one-piece molded bearing eliminates alignment problems that often show up on 2-piece bearings.
Proven by years of use on many thousands of models, the unit comes complete with blind nuts, screws and washers—only $1.95.

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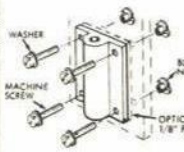
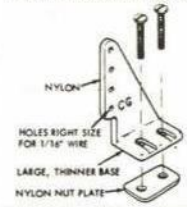
FITTINGS and ACCESSORIES

NOSE GEAR BEARING



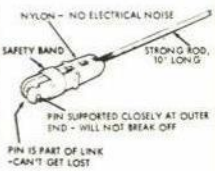
One-piece Nosegear Bearing mounts easily to firewall without alignment problems. If extra steering angle is desired, use ⅛" ply stand-off. Includes blind nuts, screws, etc. .....**60¢**

LONG CONTROL HORN



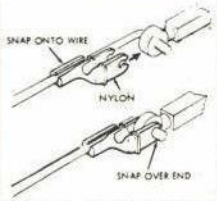
Control Horn has right size holes for 1/16" wire, and nut plate for simplest mounting to control surface. Horn is long for maximum range of throw; can be cut down. **50¢ for 2**

NYLON AJUSTO-LINK



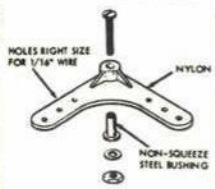
Ajusto-Link is used for adjusting linkage to control surfaces, throttle, steerable nose gear, etc. Nylon-tough and no electrical noise. Takes heavy load. ..... **29¢**

SNAP'R KEEPER



Quickest, handiest way to secure pushrod wire end to servos, horns, etc. Nylon can be squeezed together with pliers to work on wire under 1/16" diameter. ..... **50¢ for 4**

AILERON BELLCRANK



Bellcrank has steel bushing of proper size, so crank can be screwed firmly in place without binding. No electrical noise — all metal parts are screwed tightly together. 50¢ for 2

NYLON REINFORCING TAPE

Extremely tough. When applied with heavy coats of cement, it approaches fiberglass. Excellent hinge material. ¾" wide x 5 ft. .....**25¢**

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Sheet metal screws—like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers. **#2x5/16 20¢ for 10, #4x⅜ 20¢ for 8**

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Falcon 56 Canopy	**75¢**	Skylark 56 Canopy	**75¢**	Falcon 56 Nose Gear	**50¢**	Falcon-Skylark Wing	**$6.95**
Sr. Falcon Canopy	**75¢**	Jr. Skylark Canopy	**25¢**	Jr. Falcon Nose Gear	**25¢**	Sr. Falcon Wing	**12.95**
Jr. Falcon Canopy	**25¢**	Shoestring 54 Canopy	**75¢**	Shoestring Land. Gear	**$1.50**	Skylane 62 Wing	**12.95**

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RANGER 21 — All die-cut balsa parts. 21" span beauty. **$1.49**

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RANGER 30 — Die-cut balsa, 30" span, for .010-.049 engine. **$2.95**

VIKING — 48" span, Hi-thrust, for .049-.051 engine. **$4.95**

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LITTLE TOOT — Sporty Biplane, for .049 engine, all die-cut balsa. **$2.95**

LI'L WIZARD — Shaped balsa wing, die-cut fuselage, 21" span, for .049 engine..... **$2.95**

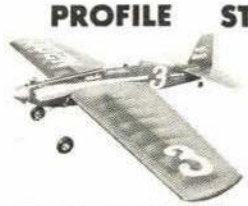
STUNT MAN 23 — Die-cut balsa, 23½", for .049-.09 engine. **$2.95**

P-40 FLYING TIGER — 18" span, all balsa pre-fab for .049 engine. **$2.50**

LI'L JUMPIN' BEAN — 21" span Favorite ½A stunt model. **$2.50**

SWORDSMAN 18 — Die-cut balsa, 18" span, for .020-.049 engine. **$2.50**

PROFILE STUNTERS


Cosmic Wind

SHOESTRING STUNTER — 42" Top stunt model for .19-.35 engine. **$5.95**

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VOODOO — 36" combat-stunt for .19-.35 engine. ..... **Single kit $3.95**
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Snap'R Keeper ..... **50¢ for 4**


#2 x 5/16 Sheet Metal Screws with Washers ..... **20¢ for 10**

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Long Control Horn ..... **50¢ for 2**

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For the conversion process, start with your templates, by using a piece of tracing paper (any transparent paper will do) and trace side view of main float from plan. On another piece, trace top view of main float. Then using any adhesive material such as rubber cement or model airplane cement, mount tracing paper pattern on template stock (thin cardboard from file folders, file cards, etc.) While main float templates are drying, use same process to make wingtip float templates (two required).

By this time the main float template should be dry. With scissors, cut around main float tracing which you have mounted on the cardboard stock. Next make the top and side-view templates. Take measurement of length and width of float from plan to determine size of wood block needed for main float. Basswood and sugar pine are best; balsa may be used but it will not give as clean an edge. Allow at least ½" in excess of actual measurement on plan for length, width and height of block.

Locate centerlines on top, bottom, sides, and ends of wood block. Cement or pin top-view of float template to block — lining up centerlines of template and block. Use a soft lead pencil with a very sharp point and carefully trace around the top-view template, then remove it. Repeat same process with side-view templates.

The method used to shape the piece will be governed by the type of equipment to which you have access. If you have a bandsaw or jigsaw available, it is a very simple task to blank out your part. Cut side-view first, following tracing line very carefully. After the lower scrap has been separated from the float piece, replace the scrap part on block, lining up centerlines accurately to create a square working surface again. Use pins (bank or common straight ones) or a drop of cement to tack in place. After float part is reassembled, saw the top-view out, following your traced line. Next, separate all scrap pieces from the float. You will now have a blank float, ready to carve to cross section.

Shaping: An X-acto Whittler's Blade, sharp pocket knife, or wood chisel should simplify the task of shaping the float. Sand all surfaces free of saw marks preparatory to carving bottom of float. Relocate centerlines on top, side, and bottom of float blank. These lines are very important as they are used in carving floats accurately, and correctly locating strut placement. Use a tightly rolled piece of garnet paper to shape the curvature of the bottom of the float, forward of the step. Cross section A is typical, in fact bottom curvature increases towards the float's nose. Be careful when you carve the forward end. If you think that I overuse the words "careful" and

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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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AIRTROL GL-100 Lowest price "Galloping Ghost" on the market. Ideal for the beginner. Simplest and smoothest ghost actuator. 3 functions-rudder, elevator and motor control. 27 mc. freq. Superhet receiver. No wiring necessary . . . simply plug into switch harness. 56" center loaded antenna. Wt. (airborne equip.) 8 ozs.

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AIRTROL R-11 Non-flopping, single channel, pulse control. One function—rudder only. Designed for aircraft up through .19. 27 mc freq. Superhet receiver. 56" center loaded antenna. Complete less batteries. Wt. (airborne equip.) 6 ozs.

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"carefully," you will quickly see why, if you do *not* take great care with this project!

To continue: take short chip strokes with a #11 blade in your X-acto knife, checking frequently to make sure that both sides are identical. Do not attempt to shape one side completely first, and then try to match them. Instead, shape both sides evenly, alternating frequently. After entire bottom of float is contoured to your satisfaction, shape the top of float. Fortunately, this is very easy to carve, shape, and sand. Repeat same process on wing-tip floats — making templates, sawing, carving, and sanding to shape. Coat the three completed floats with at least six coats of sanding sealer, allowing to dry thoroughly and sanding smooth between each application. While the sanding sealer is drying, you can make the fuselage and wing changes.

Fabricating parts: Apply three coats of liquid cement for plastic to right and left fuselage halves at all joining edges. After cement has softened the plastic slightly, join fuselage halves together, using care to line up parts perfectly.

As soon as possible, slip on a series of rubber bands and 10 to 15 pieces of scotch tape (approx. 1" to 1½" long) to hold the fuselage parts together firmly. Allow to dry and repeat the same process on wings.

Use a spatula and apply small amounts of spot putty to all seams along the length of the fuselage — top and bottom. Use sparingly, as it is only necessary to fill in the existing gaps in the plastic seams. Repeat the process on the leading edge of wings and area around the elevator. Set aside all parts which you have joined together so that the spot putty will harden. This usually takes four hours, at least.

Fill in landing gear wheels by using method you prefer, such as using sheet styrene, the landing gear doors in kit, putty or Duratite spot putty. When material used to fill in wheel wells is dry, then sand smooth.

Cowling: Fill in the gun troughs with Duratite or other filler — use .020 styrene to fill exhaust openings. On the top side of the cowling, cut in new gun troughs. Cement a piece of balsa to cowling, and shape as per plan and photo.

Center pylon strut: Trace side and front view of large pylon strut on tracing paper from plan, and mount on card stock for template. Place on block, cut side and front view. Shape with knife and sandpaper. Use a piece of hardwood to make the two struts on the main float and one for each wing tip float. Bamboo or maple are excellent choices for these parts. After shaping to a streamlined section, coat with sanding sealer. After sanding, and using sealer until wood is glass-smooth, cut your struts to proper length from the streamlined strut, using small pins and wood cement to anchor securely.

Assembling parts: Remove rubber bands and scotch tape from fuselage and wing parts. Use wet or dry to sand off surplus Duratite until seams are flush. Follow kit instructions for attaching the fuselage to the wing.

The best way to join wood and plastic together is to drill a small hole in the end of the strut and carve or file one of the plastic trees from a kit to force-fit the hole in

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CODE-A-MATIC has "flight-feel" control stick and separate "throttle" button. Energized automatically, also self-neutralizing. Transmits commands with accurate precision.

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R/C QUICK FLY III KIT
Complete with Fittings Set

RADIO-CONTROL CAR
The "Corona" $69.95

Comes fully equipped with chrome trim, bumpers, hub caps. This authentically detailed Scale model (1/15) hard-top sport sedan is as maneuverable as the original. Has FULL PROPORTIONAL steering for any degree of left or right turn. Also reverses. Special chassis switch permits change of speeds from high to low. Range of control is in excess of 200 ft., with steering wheel type control for true driver road feel. Hi-Impact plastic body is 10½" long. Inexpensive battery supply: 4—C batteries for car, 1—9V battery for transmitter. Road obstacles supplied for skill-driving game. Fully guaranteed. Detailed instructions

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A1 Macchi, M.C. (202)	$1.50
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SERVO-TROL
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CAN BE USED WITH ANY RELAY TYPE RECEIVER

Loaded with features for precise Engine (2 or 3 positions) & Rudder Control . . . Low Drain / Low Voltage (1.5-3V) / High Power / Fast Action (1 sec. or less) / Easy Installation / Light Weight (approx. 1.5 ozs.) / Small Size (2" high x 1⅞" long x ⅞" wide). Comes in hi-impact plastic housing.

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Transistorized transmitter & receiver includsd. Starts / Goes Forward / Steers / Reverses / Stops—on command! Aluminum channel chassis, positive steering gear, plated trim and wheels. Transmitter & receiver conform to latest FCC regulations. Transmitter has 9V. battery and 2 "C" batteries. extended range circuitry. Receiver can be used with any transmitter. Tunable to all FCC frequencies, pre-wired, hi-impact plastic construction. 14" long.

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Span 55", Lgt. 43", Eng. .45 & up
Almost ready-to-fly, this kit is a cinch to assemble. One of the most rugged R/C models you can buy.

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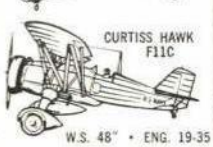

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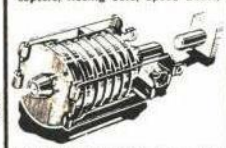

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strut. Coat with liquid cement before forcing peg in hole. Then, taking the completed strut part, with float attached, drill a hole into wing or fuselage which is smaller than the plastic peg. Using dividers or ruler, locate hole in the wing for mounting wingtip float. Coat peg with liquid cement until the plastic becomes lightly soft. Put cement in hole you have drilled, using needle or point of toothpick and force the plastic peg into the hole. This is a method which can be used anytime you are joining wood and plastic together. If you are joining wood to wood, use regular model aircraft cement.

After float and main and small struts are attached to completed fuselage, use method outlined in previous paragraph, cut a slot with a Zona saw, jeweler's or piercing saw, for the sub-rudder at location shown on plan. Sub-rudder can be made from scrap plastic, cardboard, or wood. Shape, sand, and fit into position.

Your model Rufe is now ready for whatever paint scheme you have decided on. Apply primer coat to entire plane and allow to dry; fill and sand rough spots. Spray at least two additional coats of primer to model. When dry, sand smooth after each coat. Spray light blue over entire plane, sanding smooth after each coat. (A minimum of three thin coats should be applied.) Mask off light sky-blue color and spray gray-blue all over. I list these instructions so that you will know how to proceed with this particular color scheme, but any of the ones listed may be used. Remove masking tape and blend in paint lines. Stripe metal portion on canopy with gray-blue, or car tape may be used. Propeller blades are silver on front sides and black on rear sides.

For those of you who do not wish to use the Monogram kit, the Lindberg kit has the following time-savers: no work is required

on the cowling to convert to Rufe. Landing gear wells require no work because lower wing has no openings for landing gear. The Lindberg is a good kit, but perhaps even with the extra amount of work the Monogram kit would be the most advantageous.

Now all that remains is to apply decals and your Rufe is ready.

THE MAIL BAG

From AMT, two kits: **Grumman A-6A Intruder.** Parts are good quality, molded of finest high-impact styrene plastic; matt finish decals; full complement of underwing stores. **Grumman OV-1B Mohawk.** Molded in olive-drab high-impact styrene; excellent matt finish decals; electronic surveillance model which carries an 18-ft. fiberglass radar pod beneath forward fuselage. Pod contains APS-94 SLAR radar and internal APN-129 Doppler navigation system which provides target position data on film. These two kits are in 1/72nd scale and $1.30 each.

New from Monogram: a **Huey-Cobra** team. New Huey Cobra helicopter UH-1B is designed to provide speed and maneuverability in close support of ground troops. Heavily armed with 7.92-mm mini-gun in nose turret, grenade launchers, and 76 rockets in stub-wing-mounted launchers. As these Huey-Cobra's usually are used as a two-chopper team, Monogram has included two complete models plus a display stand to mount the models in combat formation. Each model highly accurate to scale, includes full detailing of cockpit interior, clear canopy, 2 crewmen, rotating main and tail rotors, and authentic, colorful decals. Scale is 1/72nd, cost $1.50.

Also new from Monogram — two pylon racers! **Mustang** in 1/72nd scale and **Bearcat** racing plane with pylon. Monogram has put these 2 popular planes in civilian dress of red and blue, with racing numbers and trim, mounted on red-and-white checkerboard pylon. Detailed cockpit interiors, clear canopies, pilots, landing gear in up or down position, full decals and trim. Cost: $1.50, scale: 1/72.

Biceps

Continued from page 25

of turn-out measured at the trailing edge. For the elevator, recess the edge as necessary for the control-horn assembly; I used a prefabbed unit available at most hobby stores. Cement or epoxy the horn in place. Next attach the hinges, cloth, metal, or plastic as you prefer — I used cloth. Dope over them, seal, and fill the surface. A drop of oil applied to the center of each hinge before doping will keep them flexible. The final finish coats of dope will be applied after the surfaces are attached to the fuselage.

Wings: There isn't anything unusual in their construction except for the wing-strut-attachment method, which will be explained in detail later. First cut out the ribs. You may think there are a lot of them and there are, but the close-rib spacing really looks nice on the completed ship; it serves a real purpose too. On a thick airfoil, close-rib spacing is necessary to prevent the covering from sagging, which would defeat the purpose of the thick airfoil. Cut the ribs from medium-soft 1/16 sheet balsa. I made metal templates for the W1 and W2 ribs, so I could cut out about a dozen at a time which helped somewhat.

Make up the wing spars from hard, straight balsa — 1/4 x 1" for the front spars and 1/4 x 3/4" for the rear. Splice as necessary to gain the proper lengths. Slide the full-length ribs, one at a time, onto both the front and rear spar making sure you do not forget the W3 center rib in the top wing and the W7 rib in the bottom one. When the ribs are in their approximate position, pin the spars down directly over their corresponding plan, blocking them up to clear the ribs with balsa scraps — 1/8" thicker scrap under the rear spar than the front. Next, slide the ribs into their exact positions and spot-glue them in place. Later you can cement more thoroughly after removing the wing from the plan.

The trailing edges can be installed next. They may be shaped either before or after attaching. I used a razor plane on the original model which worked very well. Next put on the 1/4 x 1 leading edges after beveling one edge of each so they fit together nicely. Before trimming the leading edges to final shape (again using a razor plane or substitute), install all the false ribs (W2, 5 & 6) in their proper positions and cement thoroughly. Make darned sure you don't forget to put in the wing strut mounting blocks (made from 1/2" hard sheet balsa). Cement them thoroughly in their proper locations — bottom of the top wing, and top of the bottom wing.

Install the wing tips and other finishing pieces such as top wing center-section trailing edge and bottom wing center-section trailing edge and bottom wing center-section sheeting. Carefully sand entire structures, dope and sand again. The wings should now be ready for covering. I used silk on the original ship for durability although other covering materials may be used as well. Dope with three coats of clear and two of color for reasonably good finish, substituting a coat of filler for the third clear coat if desired.

Fuselage: Make the engine mounts first, using very hard wood (maple was used on the original Biceps). Each mount measures 3/8 x 3/4 x 12 1/8". Drill the mounting holes to fit the engine you are going to use. A Fox 59 was used in the first Biceps and worked out beautifully — a very powerful, dependable engine. Also drill the cabane strut in the location shown on the plan. Now mount the engine on the mounts using #6-32 machine screws. A small amount of out-thrust

can be added at this time if desired, although it is not absolutely necessary.

Next cut out the 1/16 plywood doublers and the 1/8 ply firewall (patterns are shown on the plan). Place the firewall in position on the mounts and apply epoxy glue to the joined surfaces. Lay the mounts upside down on a flat surface with the engine and firewall top hanging over the edge. Use a piece of wax paper or plastic wrap under the mounts to keep the epoxy off the surface. Glue the 1/16 plywood doublers to the engine mounts and firewall with more epoxy and then let everything cure.

Now cut out the 1/8 fuselage sides and 1/16 balsa doublers (grain vertical on the latter) from medium-weight sheet balsa. Then cement the 1/16 doubler pieces against the inner surface of the 1/8 side parts; be sure the cutout for the lower wing is cut out through both parts. Now cement fuselage side assemblies to the plywood doublers, putting on formers F1 and F2 at this time. After allowing the glue to dry overnight, bring the aft ends of the fuselage together and cement them with a wedge of scrap balsa for reinforcement. Install the rest of the fuselage formers, bellcrank and mount assembly and landing gear mount.

Attach a couple of 6-32 nuts to the upper surface of the gear mount while you can still get at it. Do not put the top and bottom sheeting on yet. You can, however fit the fuel tank in and build up a supporting plate of balsa underneath and on top. I used a plastic "clunk" R/C tank in my Biceps, but a metal control-line tank could be used as well. One advantage to the plastic tank is that it is removable for repair or replacement through the round hole in the firewall. If a metal tank is used, the firewall hole may be eliminated. No fuel tank fill and vent lines are shown on the plans because of the option of tank type used.

Landing gear: This is made from 1/8 spring aluminum stock. A Sig landing-gear blank was used on the original model. The aluminum spring stock is cut to size and bent to shape as shown on the plan, being very careful to use large radius bends. A small radius bend will very likely crack the hard aluminum stock, in which case, you've had it. Nothing to do but start over again with another blank. The wheels are attached with No. 8 machine screws (see plan for details).

The wheel pants are built up from three laminations of balsa with a plywood insert in the side between the wheel and gear leg. Use epoxy glue between the plywood insert and landing gear leg, and epoxy putty to fillet in for extra strength to finish off the job. You will probably have to drill out the wheel hubs with a #19 drill to make them fit a No. 8 machine screw since most wheels have smaller hub holes than that. Mount the gear on the fuselage with two No. 6 flat head machine screws, countersinking the heads flush with the surface.

Miscellaneous assembly: Install the lower wing. Before you slide it through the holes in the fuselage however, put wing flap horn into position. The flap horn is made from 3/32 music wire. The sheet metal lever arm is silver-soldered to it. Glue the wing in position and connect the bellcrank to the flap horn. Install the flaps by attaching the

hinges (fabric or metal).

Now install the stabilizer and attach the elevator to the flap horn. Thoroughly check out the control system and modify as necessary before going further. Next, install the tail wheel and mount. Before going further, all four wing struts must be built and attached. The struts are made from music wire as shown on the plan. Spiral wrap all tips with copper wire and solder all joints. Now see if you can fit the bottom ends of the cabane struts into the corresponding holes in the engine mounts. If you can — great! If not, bend the struts to fit or enlarge the holes in the engine mounts.

Place the interplane struts into position in the lower wing and fit the top wing onto all the strut tips. Make a couple of cardboard jigs (shown on the plan) to align the top wing properly. When everything fits, epoxy the lower ends of all the struts into their mating holes and allow to cure undisturbed. Remove the top wing and install the top and bottom sheeting on the fuselage. Round all corners and edges, install the rudder, and start applying the finish. At least two coats of clear followed by filler and color coats. Attach the top wing again, using the cardboard jigs and the old faithful epoxy. After attaching the top wing flaps, install the flap linkage rods and make sure they work without binding.

Build the flap linkage rods from ⅛ brass tubing flattened slightly to an oval shape. Cut length carefully so the flaps will be even and parallel. Drill 1/16 holes through the rod tips so they will end up at least 1/16 below the flap surface. The hinge pins at both ends of the flap rods are 1/16 music wire, ⅞" long. The tubing pieces that complete the assembly are 1/16 ID x 1/16" long, either brass or aluminum. Grease the rod tip, hinge pins and tips of the tubing (not

the center) with vaseline.

Place the assembly in position in the grooves in the flaps and cover with epoxy. Try to keep the epoxy away from the oval rods to prevent binding later. It is much easier to do the lower wing hookup first, then after that is cured, turn the ship over and repeat the hookup to the top wing. Be certain that the flaps are even and parallel before the last hookup is made. It is darned hard to correct later.

Build the cowling from sheet balsa, being sure to dope generously inside. The cowling may be attached using a couple of screws through the side into the engine mounts. After completing all the little details like the spinner, windshield, line guides, etc., it should be completed. Nothing left but some spectacular flying.

CO_2 Power

Continued from page 29

refilling. You can even recharge these larger cartridges yourself, from the CO2 fire extinguishers and tire inflators sold in some garages (and these too are rechargeable for a nominal fee).

We wish to emphasize that these CO2 power units are not on the market yet — so don't write and ask where you can get them. We don't know where — or exactly when. But it appears that Bill Brown Jr.'s long wait to market perfected tiny CO2 powerplants is about to end. You can be sure we'll keep you posted as to when he has something ready to sell. It shouldn't be long now!

Micro-Jet Delta: Full-sized plans for this tiny speedster aren't necessary. Just use the dimensions noted on our reduced plan. Be sure to use the lightest 3"-wide Contest balsa throughout. You can fudge a tiny bit when laying out the wing, even though when scaled to full-size, our plans show that 3½" wide sheet is required for the rear portion of the wing. Cement the three sections of wing sheet together first on a flat surface, then slip the sanded assembly into the fuselage slot and cement firmly. Note there is a slight curvature in the wing; the center (at about the CG point) is ⅛" lower than the leading and trailing edges. Bill just drew a radius for a very large circle for the wing section. You can probably eyeball this. The exact curve isn't vital, just as long as there is $\frac{3}{32}$ to ⅛" difference, as noted.

The tank must be cemented firmly in place. Feed tube to the jet engine is shown going into the fuselage slot, but could just as well be under the wing. It is vital to have the jet nozzle pointed correctly. This might require adjustment. The jet unit must be cemented to the fuselage firmly, since the entire plane is supported by the jet nozzle, when you are charging the tank.

The "Load-N-Launch" filler holds the CO2 cartridge, and has what appears to be a small knurled "chuck" at the forward end. The knurled portion is turned until the filler is a snug, but not tight, fit on the jet nozzle. Once this adjustment is made, you will not have to repeat it. The filler can be slipped on and off the nozzle with light pressure.

The special filler for the jet engine has a further sliding tip that fits *over* the chuck end. After you have charged the tank in the plane, you point the whole works up at a moderate angle, holding the filler with one hand, the sliding tip piece with the other. The plane is supported entirely by the jet nozzle fit in the filler chuck. Now push the sliding tip piece smartly forward. This disengages the jet nozzle from the filler chuck, and gives the little jet a launching shove, whereupon the CO2 takes

over to provide rapid acceleration.

No finish is needed on the plane. Remember, there is no oil or dirty fuel involved. Keep it light for the best results. Note that as this is written we do not have information on exactly when the jet units will be marketed, or what the price will be. But when they reach the hobby shops, you can be all ready to fly one with this simple delta. Bill Brown has found it to be a fine flier, and you should too!

Radio Control World

Continued from page 35

length of ⅝" dowel is epoxied to the top gear in the train, and a hole cut in the case to clear the dowel. This forms the sail winch. Another trimmable MK servo is used for steering. A 36" length of wire is spiraled around one of the shrouds toward the masthead for an antenna.

The craft runs best on hard-packed sand in winds of about 10 mph. Total weight is only 2 lbs., and the 335 sq. in. of sail area gives plenty of action, and tight turns with no tendency to tip over. Sudden gusts can tip the craft up on its nose; weight at rear of frame will counteract this. A wheel with no tread is best at the rear. Treaded wheels tend to pick up sand and drop it in the bearing!

Catamaran hulls were each carved out of 3 x 3 x 18" blocks of balsa — though 21" long hulls might be better. The blocks were hollowed like a dugout canoe, but built-up hulls would be fine, and probably lighter. Hulls must be covered on top, and have many coats of dope for waterproofing. They are attached at the front to the same wires used for the main wheels. A dowel at the rear fits over the vertical pins, is secured to the main frame.

The rear wheel and its axle are replaced by a piece of heavy copper wire to which is soldered a copper 2 x 3" rudder. Balance of the catamaran version is more critical than for the land sailer, but shifting batteries and receiver brings a satisfactory arrangement. Again, a steady 10-mph breeze is ideal. There has been no tendency to capsize, though it could happen. Due to shallow draft, there is some tendency for the boat to travel crabwise in certain winds. Deeper keels under the hulls would probably help here.

Modified Lil' T: Interested primarily in Scale modeling, much of it in free-flight and U-Control, several members of the North American Flightmasters have been trying R/C Scale gliders. One of the group, Fernando Ramos (19361 S. Mesa Dr., Villa Park, Calif. 92667) has started a model of the Darmstadt 36 glider, a beautiful T-Tail design. However, he won't try flying it until he has racked up more air time with simpler gliders. Fernando sent several pix of a modified Lil' T (Midwest kit glider) flown by Jack Elem. Mods consisted of Vee wing dihedral instead of poly, increased rudder and elevator area and no sub-fin. This craft flies with Bonner 4RS radio.

Up-dating Testor transmitter: After many flights on his Testor Skyhawk, and the eventual fatal crash, D. Bruce McLendon (2401 Dexter Ave., Silver Spring, Md. 20902) was persuaded by his DC/RC clubmates to "step up" to pulse rate-length flying. He obtained a Dickerson conversion kit and had no problems with the electrical end of the job. Rather than the specified separate control sticks, Bruce purchased a standard Micro-Avionics stick unit, and fitted this into his modified transmitter, complete with the built-in trim levers.

Instead of buttons for throttle control, he has used a Model Rectifier Corp. #7 toggle switch. It has center off, and lever is spring-

loaded to return from either displaced position, where separate contacts are closed. Trim pot included in the Dickerson kit was not needed.

New front panel covering for the Testor case is wood-grained contact-adhesive paper. Receiver mods took some four hours including comprehensive checkout, and the transmitter changes only an hour. That Micro-Avionics stick unit will give Bruce the "feel" he'll need when he eventually goes to full-house multi.

Vibrating rudder: For some reason, engine vibration seems to concentrate at the tail of many planes. An interesting case is described in The Glitch (Soo Modelers Radio Control Club, Dr. Nino Campana, Editor, 50 Summit Ave., Sault Ste. Marie, Ontario, Canada). A modeler noted that when he dived his multi ship it emitted a loud buzzing sound. Upon landing the rudder pushrod was found broken.

Repaired, the plane was flown again, pushrod broke in another place. Again repaired, this time a rudder hinge broke. After that, the threaded area of the quick-link! A friction damper was added to reduce the rudder vibration, also some 25% of the rudder area was removed. Next flight, the link broke again. The rudder was then locked solid with a balsa peg. While peaking the engine prior to flight, the peg broke off. The final answer was to attach a ½-oz. weight to the rudder to "detune" it, and no further problems were had. The engine on this plane was side-mounted, probably causing a side vibration mainly affecting the rudder. Perhaps a vertical engine would have caused *elevator* vibration troubles. After a crash, we often find a broken pushrod — but we can wonder if, perhaps, such broken rods might have *caused* the crash!

International Scale Challenge: The modeling section of Les Ailes Mosellanes, an active aviation organization in Metz-Borney, France has issued a challenge to all R/C scale model flyers to compete in an International Scale Contest which they are hosting on July 14 and 15, 1969, at the French Air Force Base, Metz-Frescaty. Camping and lodging facilities are available nearby and can be arranged through the club. Advanced registration is requested, but not mandatory. Entry fee is 30 francs, and prizes include cash awards to third place: 1,500, 1,000 and 500 francs respectively. The competition is using the FAI rules throughout.

The flying site, at the Air Base, is a 50 meter diameter asphalt circle. So all kinds of models will manage easily.

To enter, or for further information, contact the organization at: Les Ailes Mosellanes, Club "Le Graouilly," B.P. 701 (57) Metz, France.

Funtique

Continued from page 15

will make the airplane much more realistic and fun. The photos should give you a pretty good idea how the model may be finished, but here are a few additional hints:

1909 Blearyeye: A small hole is drilled at the center of the wing, and a 1½"-long piece of hardwood dowel is glued in place to serve as a rigging mast. The actual rigging is sewing thread, and may be sewed right through the wings at the rigging points shown on the plan. A drop of glue will hold the rigging to the top of the mast.

The black paper circle representing the cockpit is glued on the wing, as shown in our photo(s) as is the paper pilot. The rear fuselage structure is represented with strips of thin black chart tape, or you may draw the lines on with a marking pen. A ruler will make it much easier to put these lines on straight. Chart tape can be purchased in several widths and colors at art supply stores, or some hobby stores carry it under the name of striping tape. It is also used for slot cars. The competition numbers may be cut from the magazine, or you may prefer to use different ones. A good source of large numbers is an old wall calendar. The 3-cylinder radial engine drawing is cut from the magazine and glued to the nose-block, which completes the model.

The Curtiss Cabin: The letter Cs and the NC numbers are cut from the magazine and glued on the fin. The cabin windows are cut out and glued to the wing mount. If you wish, you can add an exhaust stack on each side of the cowling. The two rows of louvers are made from short strips of chart tape, as are the lines on the fuselage sides, aileron outlines, etc. Choose whichever radiator drawing you prefer, and glue it on the nose block.

The Fokker Kleindeker: Cut out the various iron crosses and cowling sides and glue them on the model. The black circle representing the cockpit is glued in the same location as shown on the plans, and the mighty Baron von Phinque is inserted in his slot. Next, the radiator drawing is glued to the nose block. If you wish to give your model an extra Fokker touch, you can make scallops in the trailing edge of the wing. To do this, wrap a piece of sandpaper around something round, such as a screwdriver handle, and carefully sand scallops at regular intervals into the wing.

The Dooalot Racer: This little pylon polisher is a cinch to decorate, and looks like it's roaring along even when standing still! The cockpit and pilot are located in the same place as the Fokker model, but a headrest carved from scrap balsa is added.

The racing numbers may be cut from the magazine or an old wall calendar. The fuselage stripes, aileron separations, etc., are made from chart tape. If you prefer, a solid teardrop of colored tissue may be glued or doped onto the fuselage side, giving a two-tone effect. The exhaust ports are cut out and glued on either or both sides of the cowling, as you prefer. A small plastic windshield is optional.

The racer nose drawing is cut out and glued to the nose block. Finally, cut out a pair of paper landing-gear fairings, as shown on the plan. These are folded and glued around the landing gear wire as shown in our photo of the model.

The S.E. 4⅞: This put-on of a Royal Flying Corps aircraft is very colorful, but since there are more decorations than on the other models already mentioned, it will require a little more patience. The results are well worth the extra effort, so take your time and do a neat job. The cockpit disk and headrest are in the same location as on the racer model. Naturally, Geoffrey Goodgye is the hero pilot, and you may even wish to add a flowing tissue paper scarf to his neck! The various cockades, numbers, and tail stripes are cut out from the magazine (and colored with crayons, colored pencils, or felt pens).

Try each item in place before gluing it to ensure even placement on both sides. The engine blocks and exhaust stack units may be glued to both sides of the cowling, taking care that they are level for best appearance. The radiator drawing is glued to the nose block, and the aileron outlines and other control surface lines are made from chart tape, or drawn on with a fine-line marker. The small plastic windshield is optional. Incidentally, the mast and rigging look quite well on both the Fokker and

S.E. 47/8 model, so add it if you care to.

Flying: If you have constructed your model carefully, you can expect some fine flights, after it is properly adjusted. Start by sliding the wing backwards or forwards on the fuselage until the model hangs about level with a finger under each wingtip. If you find that the wing must be slid back to where the fuselage starts to taper together, add a bit of modeling clay to the nose, so that the wing will not need to be so far back. Using a "stuffing stick" as shown in the drawing, insert one loop of rubber into the model. The rear rubber peg is partially withdrawn, then reinserted through the rubber loop. This peg should be a snug fit so that it will not vibrate loose during flight.

The model is now ready for testing. Wait for a calm, dry day. Even the early morning dew could be harmful to an all-balsa model, since the moisture could cause warps. Try to find some tall grass or weeds to serve as a soft landing field. Point the nose of your model slightly down, and give it a gentle launch (do NOT throw). If the model dives into the ground, slide the wing slightly toward the front. If the model stalls (hangs on its nose) slide the wing a bit to the rear. About an eighth of an inch each time is enough to make a difference.

When the model glides to your satisfaction, put about 60 or 70 turns into the rubber motor, and try a gentle launch. If the model flies in a straight line and stalls, or wobbles slightly from side to side, put a small strip of balsa or cardboard between the nose block and the nose bulkhead, so as to point the propeller toward the right (as viewed from the tail). Wind the model and launch it again. It should fly smoothly to the right in a large open circle. If not, add another thickness of cardboard or balsa and try again. Usually, a thickness of somewhere between 1/32" and 1/16" will do the job. If the model does not respond satisfactorily, examine it for warps. If you find any, they may be removed by holding the warped part over a steaming teakettle, and twisting the out-of-line surface a little past where it should be. When the part has cooled, it should be o.k.

It is possible that your model may require a small amount of up- or down-thrust. This is achieved in exactly the same way as was the right-thrust. If you stop to consider that all this does is to change the direction in which the propeller points, you will quickly see what, if anything, is needed to make the model fly properly. Once you are satisfied that the model is flying well, increase the number of turns in the rubber motor. As the power is increased, some minor readjustments may be required. If you have a winder, you can really pack in the turns, and greatly improve the performance and duration.

Also, you may wish to experiment with more power, such as a larger size of rubber, or two loops instead of one. The power can also be varied by changing the length of the rubber loop. A longer loop has less power, but can take more turns without breaking, while a shorter loop is just the opposite. If the model habitually falls off on one wing (banks sharply) add a small amount of modeling clay to the opposite wing. Turn adjustments can also be made by breathing on the rudder and bending it in the direction you wish the model to turn, but take it easy with this approach. After your model has been perfectly adjusted, you may glue the wing on permanently, and throw away those unsightly rubber bands.

Incidentally, this model recently completed a flight all the way from North Hollywood, California to Washington, D. C. . . . in a box, of course!

NEW IN R/C

A two-channel digital control system intended especially for marine use was announced by **Citizen-Ship Radio Corp. (810 E. 64th St., Indianapolis, Ind. 46220).** Tested extensively in power-boat competition, equipment was used to win four firsts at the '68 IMPBA Nationals by Ed Hughey (plus four seconds and three thirds!). Available on the 27 MHz frequencies, DPT-2 transmitter features left control stick with a ratchet for throttle (easily converted to spring centering).

Unit is housed in grained vinyl case, operates on inexpensive 9 V. dry battery. Superhet DPR-2 receiver measures $1^{31}/_{32}$ x $2^{35}/_{64}$ x $^{61}/_{64}$", weighs 3 oz. including all wiring and plugs. Integrated circuits act as decoders. (This receiver will also operate from C-S's DPT-3, -4 or -5 transmitters.) Model DMS servos provide 4 lb. minimum thrust, are in high-strength, molded nylon cases, weigh $2^3/_8$ oz. each. Servos have push-pull and rotary outputs. Equipment in model is powered by a lightweight 4-cell nickel-cad pack. Cost for entire system is $199.95. All components available separately.

Latest addition to line of R/C accessories by **Rand Mfg. Co., Inc. (8909 Hubbell Ave., Detroit, Mich. 48228)** is **fiberglass tape** in three widths. Comes in $1^1/_2$, 3 and 6" widths, all in 60" long rolls; costs 75c, 90c and $1.50 respectively. Tape is about .007" thick, and edges are woven to prevent unraveling.

As might be expected, the plans for the fabulous **Nieuport II** which was a sensation at the **R/C Scale** event, 1967 Nationals, are outstandingly detailed. Lou Proctor has done as fine a job on them, and on the instruction book, as he did on the plane itself. Plans, which are blue line on white, consist of four sheets 29 x 69" and one sheet 12 x 36". With this huge area, everything is full-size.

Besides full-sized side and front views of the entire plane, there are construction views of the fuselage from sides, top and bottom, and a fantastic number of detail drawings. Every single part in the plane is numbered; the list of these parts alone runs to $5^1/_2$ typed pages. The 31-page instruction book includes many full page photos of the assembled model before covering, as well as assembly sketches. For those not familiar with Lou's Nats winner, these are the specs: Upper wing span — 62"; lower span — 55", overall length — 47".

Lou carved an 18" dia. laminated scale prop and actually flew with it, powered by a McCoy 60. The plane weighed 7 lb. 10 oz., and was controlled with Orbit reed gear. The plane is scaled $2^1/_2$" to one foot. Not only is it absolutely to scale in outlines, wing section and outer appearance; the construction is true scale as well! Further info on this fabulous model may be had from **Proctor Enterprises (935 Reed Ave., San Diego, Calif.).**

Not as directly oriented to R/C as has sometimes been the case, the **1968-1969 Aero Modeller Annual** nevertheless has much of interest for our field. There are a dozen three-views of R/C planes (stunters, sportsters, Scale types, gliders), articles on uses of epoxy, also of foaming plastics, plus general modeling material that could apply to R/C building. This 128-page hard cover book may be had from such large suppliers as **Polks Hobbies (314 5th Ave., New York 10001)** and other large hobby shops; costs about $1.25.

Orbit Northeast (3933 Harlem Rd., Buffalo, N. Y. 14215) is the place to contact for **sales, repairs and service of Orbit R/C equipment** for those in the area. Orbit Northeast will save you time and shipping expense. They can handle warranty work, no matter where you purchased your Orbit equipment. It's the same place to which you write for deBolt Model Engineering Co. Hal deBolt has been a long time user of Orbit equipment. Now he joins the organization, along with Paul Carlson, to provide fast service on any Orbit gear in the Northeast. P. S. — deBolt Model Eng. is still going strong too!

Low cost means of spraying dope, paint and other liquids is offered by **Ace Radio Control (203 W. 19th St., Higginsville, Mo. 64037).** They stock **Preval Spraymakers,** complete unit selling at $1.29. Consists of an aerosol unit, onto which screws a calibrated jar to hold the liquid you wish to spray. One aerosol unit will dispense 16 oz. of liquid mixture. Extra "power units" cost 98c. Extra 4 oz. liquid containers are 35c. Ace's new and completely revised catalog was due for mailing around the first of 1969; besides a complete up-dating with countless new items, there will be many new R/C Data Sheets for the tinkerers.

Bill Johnson throttle systems: Control-line Carrier event flyers have somewhat the same problems as R/Cers — they want top power from a hot engine, but also need very low and reliable idle. Rossi and other engines fitted with the throttle systems developed by **Bill Johnson (6328 Jackson, Berkeley, Mo. 63134)** have won countless Carrier events, in meets from the Nats down to local affairs. R/Cers who demand widest possible power and speed range should look into Bill's Methods.

Basically, he fits a special slide-valve exhaust throttle (send him your engine and $5 for this job). To this is added a control valve (cost $6) that varies fuel to carb. Valve is linked to exhaust slide, and system works with any fuel-feed system, pressure or otherwise. In some cases a simple butterfly is added to outer end of carb venturi. Since latter may be made as large as you wish with this system, top power may be had from any engine. Quite a few 40 engines have been so-fitted, with fine results, and Bill's engines have done well in both R/C boat racing and Formula I R/C pylon. Write him for full info.

Lightweight (1 lb. 6 oz. with cord) **sealing iron** offered by **Darin Bros. (Aileronee Div., 5221 Allen Rd., Allen Park, Mich. 48101)** especially for their own **Qwik-Cote** — works well with similar material. Solidly constructed industrial tool, has reliable thermostat to hold the desired heat level; may be set from 225-600° F. Well-balanced, convenient to use. Unlike flatirons, which generally draw high current, tool is rated at maximum of 160 W. Handle stays cool during prolonged use; working surface measures about $1^1/_2$" x 4" long. Price $15. **Qwik-Cote** comes in 26" x 36" sheets, "dry" adhesive (non-sticky to touch), six colors, plus black and white; $3.70 per sheet.

Scaled for **Goodyear racers,** line of **"instruments"** to dress up cockpit offered by **Halcyon Santa Barbara (Box 64, Goleta, Calif. 93017).** These $2^5/_8$" scale instruments normally 3" diameter, 10 that are 2" dia. In either civil aviation white or military buff — specify which. $1 per set; NMPRA members get **two** sets for a buck (include your racing number with order).

CONVENTION DATE CHANGE ANNOUNCED

NAR's President, Dr. Ellsworth Beetch, announced a change in January to the dates of the annual convention for NAR members in Pittsburgh this spring. At press time, the Steel City Section was contacting all sections to make certain they understood the dates would be 28-29-30 March, with the first meetings underway early Friday evening. Sections should verify their members attending and contact Alan Stolzenberg, 5002 Somerville St., Pittsburgh, Pa. 15021, before March 15 concerning reservations.

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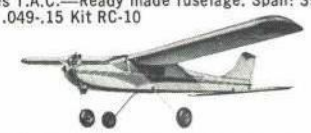

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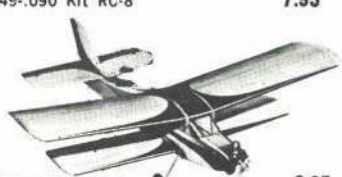

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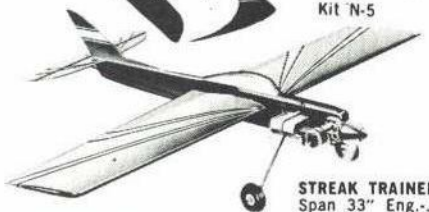

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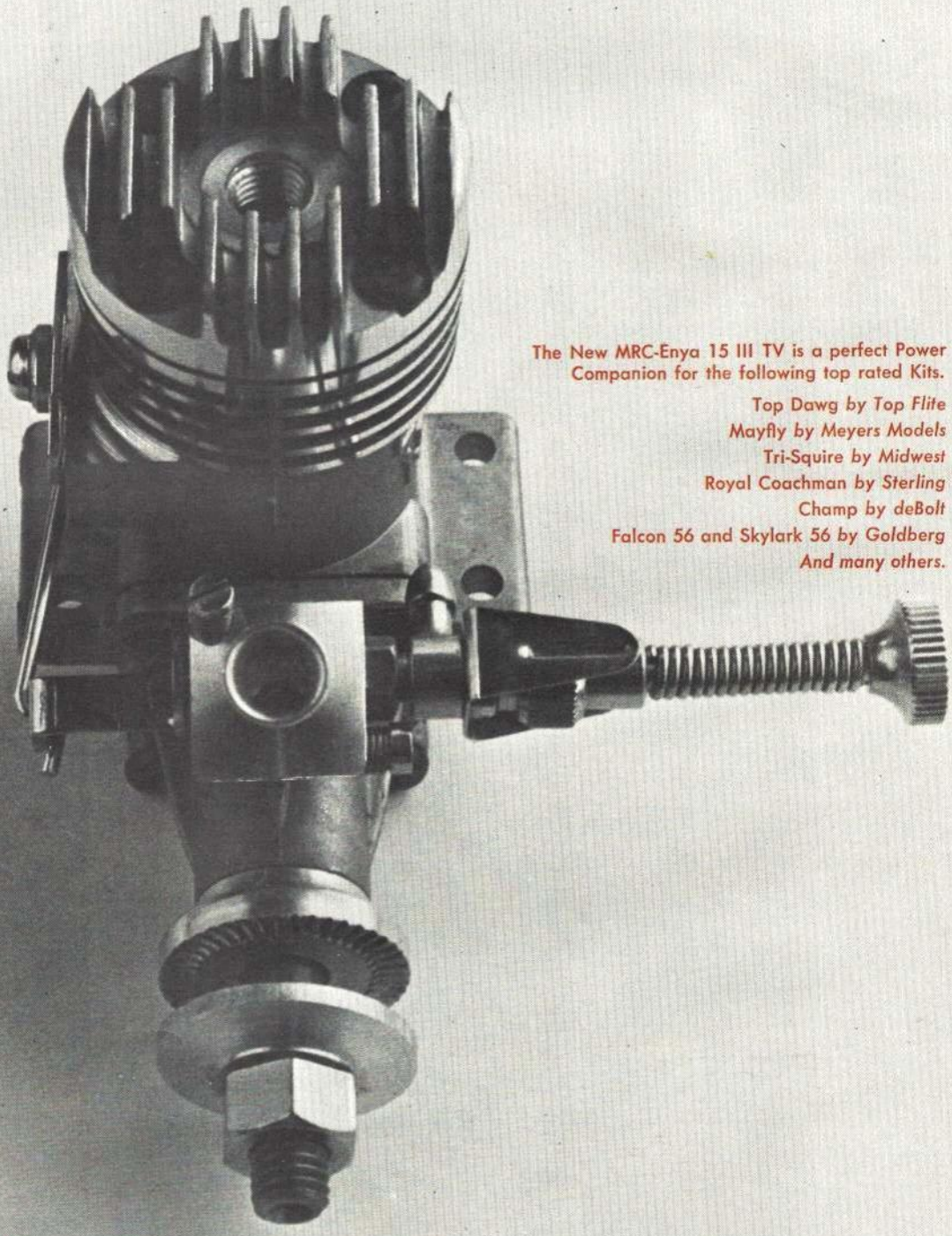

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