# R/C MODELER

THE LEADING MAGAZINE FOR RADIO CONTROL • MARCH 1968 • 60¢

# A few words about me.

I am Electronic Engineer and this is my day job.

From tender age two things attracted my interest and I managed to have them in my life.

The first was electricity and the second the bluesky.

I´ve found the model airplanes hobby in October 1973.

I love the wooden structures from scratch airplanes and boats also.

I started collecting plans, articles, books and anything else that could help the hobby of many years ago and have created a very large personal collection of them.

Since 2004 I became involved with the digitization and restoration of them and started to share the plans from public domain with my fellow modelers.

Now after all this experience I have decided to digitize, to clean and to re publish in digital edition and free of all issues RC Modeler magazine from 1963 to 2005 and others books and magazines.

Certainly this will be a very long, difficult and tedious task but I believe with the help of all of you I will finish it in a short time.

I apologize in advance because my English is poor.
It is not my mother language because I am Greek.
I wish all of you who choose to collect and read this my work good enjoyment and enjoy your buildings.

My name is Elijah Efthimiopoulos. (H.E)
My nickname Hlsat.

My country is Greece, and the my city is Xanthi.

# Λίγα λόγια για μένα.

Είμαι Μηχανικός Ηλεκτρονικός και αυτό είναι το αληθινό μου επάγγελμα εργασίας.
Από μικρός δυο πράγματα μου κέντρισαν το ενδιαφέρον και ασχολήθηκα με αυτά.
Πρώτον ο ηλεκτρισμός και δεύτερον το απέραντο γαλάζιο του ουρανού και ο αέρας αυτού.
Το χόμπι του αερομοντελισμού το πρωτογνώρισα τον Οκτώβριο του 1973.
Μου αρέσουν οι ξύλινες κατασκευές αεροπλάνων και σκαφών από το μηδέν.
Ξεκίνησα να συλλέγω σχέδια, άρθρα, βιβλία και ότι άλλο μπορούσε να με βοηθήσει στο χόμπι από τα πολύ παλιά χρόνια.
Έχω δημιουργήσει μια πολύ μεγάλη προσωπική συλλογή από αυτά.
Από το 2004 άρχισα να ασχολούμαι με την ψηφιοποίησης τους, τον καθαρισμό τους αλλά και να τα μοιράζομαι μαζί σας αφού τα δημοσιοποιώ στο διαδίκτυο (όσα από αυτά επιτρέπεται λόγο των πνευματικών δικαιωμάτων τους).
Σήμερα μετά από όλη αυτήν την εμπειρία που έχω αποκτήσει, αποφάσισα να ψηφιοποιήσω, να καθαρίσω και να ξαναδημοσιεύσω σε ψηφιακή έκδοση και ελεύθερα όλα τα τεύχη του περιοδικού RC Modeler από το 1963 μέχρι το 2005 και κάποια άλλα βιβλία και περιοδικά.
Σίγουρα είναι μια πολύ μεγάλη, δύσκολη και επίπονη εργασία αλλά πιστεύω με την βοήθεια όλων σας να την τελειώσω σε ένα καλό αλλά μεγάλο χρονικό διάστημα.
Ζητώ συγγνώμη εκ των προτέρων γιατί τα Αγγλικά μου είναι φτωχά.
Δεν είναι η μητρική μου γλώσσα γιατί είμαι Έλληνας.
Εύχομαι σε όλους εσάς που θα επιλέξετε να τα συλλέξετε και να τα διαβάσετε αυτήν την εργασία μου καλή απόλαυση και καλές κατασκευές.
Το όνομα μου είναι Ηλίας Ευθυμιόπουλος.( Η.Ε )
Το ψευδώνυμο μου Hlsat.
Η χώρα μου η Ελλάδα και η πολη μου η Ξάνθη.

**RCM Magazine Editing and Resampling.**

**Work Done:**

1)Advertisements removed.

2) Plans building plane removed and hyperlinked.

3)Articles building plane removed and hyperlinked.

4)Pages reordered.

5)Topics list added.

**Now you can read these great issues and find the plans and building articles on multiple sites on the internet.**

**All Plans can be found here:**

**Hlsat Blog RCModeler Free Plans and Articles.**

**http://www.rcgroups.com/forums/showthread.php?t=2354459**

**AeroFred Gallery Free Plans.**

**http://aerofred.com/index.php**

**Hip Pocket Aeronautics Gallery Free Plans.**

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**James Hatton Blog Free Plans and Articles.**

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**Thanks Elijah from Greece.**

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features



departments




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# EDITOR'S MEMO

DURING the past few weeks we have received numerous letters from various segments of the model industry concerning the discount mail order advertising that has appeared in the model press. A great many of these letters stress the fact that this type of merchandising will eventually destroy the small hobby shops that comprise the "front line" of our industry.

As a cited example from one such letter, consider the average modeler who finds that he can save twenty-five percent by buying his radio equipment and kits from an ad in one of the publications. It's only human nature to want to save as much as possible on any item we buy, so our friend orders direct from the discount house. When he needs a fifty cent prop, or a package of blind mounting nuts, or maybe some friendly advice, he goes back to the local hobby shop dealer. Now this dealer, who is too small to buy in the same volume as the larger discounter, and therefore, who cannot offer the same discount, ends up with the nickel and dime business — plus a lot of free advice in answer to the modeler's questions. And that nickel and dime business and free advice won't keep him in business very long.

So what happens? The hobby shop criticizes the model press for accepting the advertising, and some even go so far as to remove these publications from their shops, since the discounting advertising they carry is putting money in their competitors pockets. The manufacturing end of the industry is unhappy with the publications since the discounters list a lesser price on their products than the manufacturers list in their own advertising.

And the model press ends up as the villain. We're the dirty dogs that accepted these ads in the first place.

Well let's look at all sides of the picture and try to clear the record.

First of all, speaking from our own standpoint as a single publication, **we cannot refuse advertising from a discount advertiser.** This is in direct violation of Federal Trade Commission rulings which specifically prohibit any attempt by publishers to attempt to fix, or otherwise set prices, by refusing such advertising. Any attempt to refuse such advertising on other grounds, be they contrived, is illegal and could well be considered as an attempt to fix prices. A magazine or newspaper can accept or reject advertising at the publishers discretion — only if such rejection is not based on illegal grounds such as for discounted prices. R/CM has, in recent months, refused advertising from firms about whom we have received numerous valid complaints concerning fraudulent advertising claims and/or improper customer service. We will continue to exercise our legal prerogative as an independent enterprise to refuse such advertising in the future.

But we will not violate Federal law due to pressure from the model industry. If such a law is considered by the democratic majority as unjust, then it can be altered, or eliminated, by just, democratic process.

We don't have an answer to the problem. But here's how the scoreboard stands:

1. The manufacturer sells his merchandise to the distributor.
2. The distributor, buying at 50% or more off, sells to the hobby dealer. A firm qualifying for distributor discounts by virtue of the volume he purchases, can elect to sell direct to the consumer at a discounted price, of say twenty-five percent off the suggested retail price.
3. The hobby shop dealer buys from the distributor at thirty-three percent off the suggested list price. If he attempted to meet that twenty-five percent discount offered by the direct selling concern, he would probably have to close his doors in the near future.
4. The hobby shop dealer cannot exist on the nickel and dime items if the majority of his customers bought their higher priced items elsewhere.
5. The consumer has the right to purchase his merchandise at the best price possible.
6. The model press cannot by law, refuse advertising due to the pricing structure of items offered by an advertiser.

So there you have it — a major problem soon to be faced by this industry. All we can point to in reference is the general consumer market outside of our own industry. There are discount stores everywhere, operating literally side by side with conventional retail outlets under the democratic principle that an individual has the right to offer his merchandise and/or services to the consumer in such a way as to be attractive in a competitive market.

As a closing thought . . . is the hobby shop who offers ten percent discount to local club members, or the advertiser who offers a few dollars worth of free merchandise when you buy a certain dollar volume of model goods any less "guilty" of discounting?

It's all a matter of degree.

It's called free enterprise.

●

Several months ago, in the issues that covered the 1967 R/C World Championships at Corsica, we mentioned that Cliff Weirick was somewhat "hampered" by the scale Chipmunk he had entered at the Internat's. Suddenly, no one in the country wanted to touch the Chipmunk design with a ten foot pole! Apparently, from what we can deduce, our report was construed by a great many readers as implying that the Chipmunk design simply wasn't any good.

Nothing could be farther from the truth. And that "misinterpretation" isn't fair to

*(Continued on Page 8)*

the original design published in Model Airplane News, or to the kit of that design manufactured by Jack Stafford Models. The Chipmunk is an excellent flying aircraft, and far and away one of the best flying scale models ever produced. This is not meant as a retraction of our statement, but rather a clarification of it — what was meant was simply that our reporters felt that Cliff could have gained more points if he had entered a ship designed for all out stunt patterns. Remember, the Internat's is the very top echelon of fliers from around the world, and every break in your favor goes a long way.

Perhaps Cliff's letter will help clear up the matter:

Dear Don:

It's been quite a while since I read the article that Jim Martin wrote on the Internats in Corsica and I suppose that I should have gotten back to you much before this. However, things being as they are, I've been pretty busy and such as that.

Anyway, I feel that the headline and a few of the comments in the article concerning the Chipmunks were a little bit out of line. The word "hampered" by the Chipmunk is a little bit unrealistic, I would say. Let me explain the circumstances. The Chipmunk that I flew in Corsica was a brand new airplane. The three flights that we flew over there just happened to be 10, 11, and 12 for that particular airplane, and there is no stunt pilot in the United States that I know of that can learn all the idiosyncrasies of a model airplane in that short amount of flights. I feel that I could have done much better with the other one that I had but primarily the reason that I flew the Chipmunk was to prove a point and I believe that I did do that. I have always been a very strong advocate of the fact that scale type aircraft could be used for stunt when properly setup. I don't mean to infer that the Chipmunk is the best thing that there is for stunt. It is a very, very nice flying airplane, a very forgiving airplane; however, I will agree that it does not do some of the maneuvers as well as a regular stunt type aircraft.

I think possibly that the new AMA stunt pattern, with the free style maneuvers, that something like the Chipmunk now will start coming into its own because it snap rolls like a dream and will do some of the other maneuvers quite well. I have been working with Jack Stafford on the Chipmunk for some time now and we have a few ideas to improve its performance. Whether or not these will be cranked into the kit I don't know. Also, keep in mind that the kit was not put out as a stunt model. It's primarily a scale type aircraft, however, I chose to use it for stunt because if for no other reason I fell in love with the little airplane right from the word go. I am in the process at the present time of making a new one on which I am going to put a retractable landing gear. Whether this will enhance the performance or not I don't know, however, it's something to keep in mind. I also have a little different wing for it, a little bit more area and a little bit different airfoil. Whether these will help in stunt capabilities I don't know.

It is my own personal opinion that the one spot that the Chipmunk does fall short is on take off and landing. Of course, here you have a conventional type landing


KEN WILLARD

EVERY now and then so many things happen during the month that it's pretty hard to pick out which items would be of most interest to you. This month, though, it was easy. I was initiated into the fraternity of slope soaring enthusiasts! The R/C Bees of Santa Cruz had what they call a "Soar in" at their soaring site at Sunset Beach State Park, so I decided to go.

Naturally, it wouldn't be much fun just to kibitz, so I had to get a soaring glider together — and there wasn't much time. So I took the easy way. Some of you will remember the twin pusher .020 design I had in R/CM a couple of years back, called the "Double Feature." I mentioned in the text that it could be converted into a soaring glider by removing the engines and landing gear and making a high aspect ratio wing for it, so that's what I did. I left the engine mounts in place, but streamlined them with simple little plugs. Then I took out the escapement and fitted in the Bonner 4RS unit, using two servos for rudder and elevator. Finally, I made a 7" by 63" wing, using a flat bottom airfoil, which I had checked out with Whitey Pritchard.

Test glides showed that the model had a nice flat glide. They also showed that one more modification was necessary. I doubled the rudder area, since the original rudder was virtually ineffective with the longer wing.

The wing was covered with the new dry MonoKote, and that saved a lot of time. Incidentally, I've been telling you about this material for some time now, and you've been patiently waiting for it to get out of the experimental stage. Well, it is, and by the time you read this it will have been formally presented to the modeling fraternity at the Los Angeles Model Airplane Trade Show. It's the quickest way I know of to cover a model, and if you use the presently available "wet" MonoKote for trimming, you can get a very professional looking finish in a minimum amount to time. There's one thing I might mention; your first attempt may not be perfect. Neither was mine. Neither was my first attempt to cover a model with silk, so you shouldn't give up. Try covering some test panels, and you'll soon get the hang of it. The wing that I made for the slope soaring version of Double Feature was covered on a Saturday afternoon between quick glances at a football game on TV.

The day came for the "Soar in," and away I went. Whitey had told me that the wind hardly ever comes up before noon, but I was optismistic and arrived there about ten A. M. He was right. No wind. But it gave me a chance to look over the site, and as other modelers arrived we all commented on the beautiful view. That's one thing about slope soaring — you have to be up on a hill, and the view is usually good no matter where you are. But when it is a hill high above a sandy beach some two hundred feet below you, and the crashing surf of six foot waves look like little ripples, and you can look way out

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The Chief Sunday Flier launches his slope soaring version of the "Double Feature." Note big rudder.

over the ocean and see tiny fishing boats, and an occasional freighter will pass on the horizon — well, it's a totally new dimension for flying R/C. Couple the view with the fact that there are no snarling engines to shatter the peaceful scene, and I can tell you it is one of the most restful surroundings I've ever been in. You've got to try it to really appreciate it.

To continue with the story of the event, though, it finally came noontime, and still no wind worth mentioning. By that time nearly everybody had arrived, and there were about thirty five gliders ready to go. And were they beauties! I had some of the guys line up with their models (I couldn't get them all in!) and took the accompanying photo. Yes, that's Jerry Nelson with the big job. Although I didn't have the smallest glider, it was one of the smallest, so naturally I had to get a shot of Jerry with his monster standing next to me with the "little" job, which had the longest wingspan of any model that I've built since the Avalon Breathless. Jerry's model, as you can see, has about a twelve foot span.

About one o'clock a slight breeze came up, so I tossed my model into it and started sailing along the slope — only to get blown back on to it, even though I was holding full rudder to try and head into the breeze. Yep. Even though I had doubled the rudder area, it still wasn't enough. Somewhat chagrined, I retrieved the model, and using some masking tape and cardboard I added more rudder area. You can see the result in the silhouette shot of the launch. Moral — if you plan to design a slope soarer, be sure and have a bi-i-g rudder!

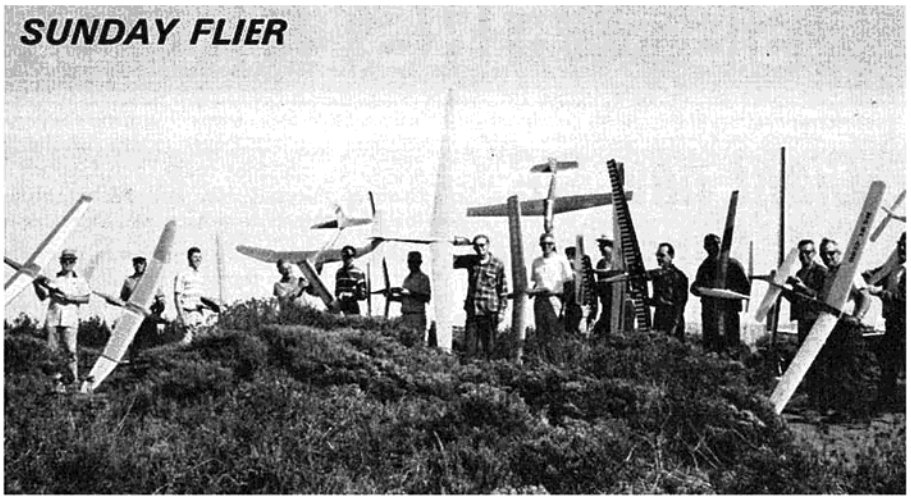
As luck would have it, there was only about a period of forty to forty five minutes when we were able to soar and stay above the crest of the hill. The rest of the time the wind was either too gentle, or it was a shearing wind almost parallel to the hill, and thus didn't develop any lift. But we all tried anyway. Jerry tried twice, and both times had to land on the beach. Most of us, though, as soon as we saw that the lift wasn't there, just dumped our models unceremoniously into the side of the hill.

On one flight, however, the wind was up pretty well, and there were about six of us in the air at various altitudes. I managed to work the Double Feature up to about fifty feet above the hill at one time, and it was really a thrill. But Whitey assured me later that there are days when the wind is up that you can get eight or nine hundred feet up! Boy, I can hardly wait.

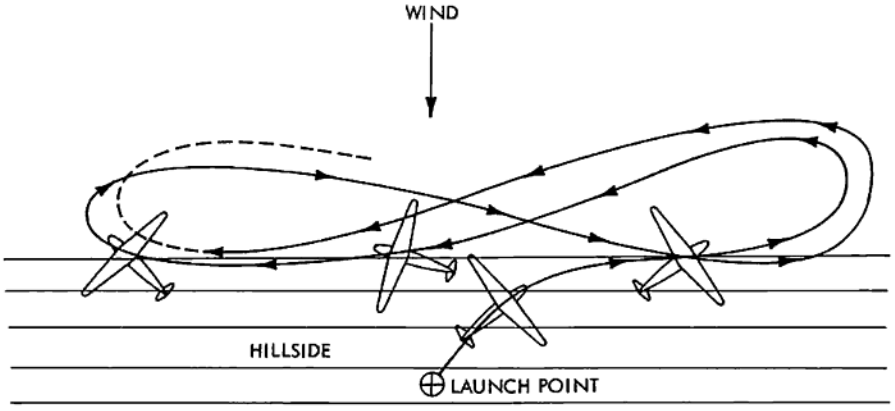
To many of you who have done slope soaring before, this little description will be old hat. But there must be many of you Sunday fliers who, like me, have never done slope soaring. Don't wait any longer. Find yourself a nice hill with a prevailing wind that blows against it; build yourself a soaring glider (there are several good kits available) and treat yourself to a new and exhilarating experience in R/C!

The basic technique is so simple that you can learn it in just a couple of flights. At the risk of being considered presumptuous by those who have much more experience than I have, let me describe the flight pattern.

Launch into the wind at a quartering angle, then adjust the heading of your



R/C Bees "Soar-In" at Sunset Beach State Park.




## SUNDAY FLIER

*(Continued from Page 6 )*

model so that it is flying parallel to the hillside. This means that it will appear to be "crabbing" along the side of the hill, since it will be headed slightly out from the hill to keep the wind from blowing it back into the slope. When you've gone as far along the hill as you want, turn out into the wind and come around back towards the transmitter. Let the model drift back towards the hill, so that when you get down to the other end of the hill and are ready to turn around, you can again turn out away from the hill into the wind and come back along the hillside to repeat the pattern. And that's all there is to it.

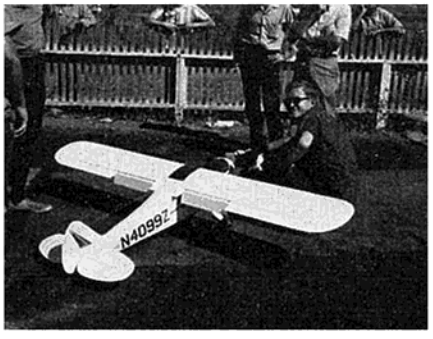
After you learn the basics, you can progress as far as you want. Aerobatics — speed — precision — it's up to you. As for me, I can hardly wait for the next time there's a wind at Sunset Beach!

Like I said, sometimes there are lots of interesting things to write about, and slope soaring happened to really turn me on this time. But that doesn't make some of the other things any less interesting.

Take, for example, vintage scale. The reliability of modern radio gear makes it practical to build very detailed models of early flying machines without the fear that radio failure will demolish your dream ship before it has a chance.

Floyd Carter is shown with his beautiful model of the Antoinette #7, a 1909 design. Naturally, he made some modifications — ailerons instead of using the wing warping technique, but you have to agree with me that the sight of a vintage model flying overhead, with the sun glinting through the covering on the wing, is a real treat to the dedicated modeler.

Then there's "classic" scale. Ed Ames comes up with a good example in his Cub. Take the wing struts, for instance. They're functional — even though the wing probably doesn't really need the additional strength which they provide. But you're not quite so worried that a bad landing will rip everything apart. Ed's using a PCS rig, and currently is modifiying the model to have a slightly bigger fin and rudder. He put in the dihedral which the plans recommended, but with proportional radio a larger fin and rudder gives better control.




Jerry Nelson with Cub for towing gliders. Beautiful scale performance.

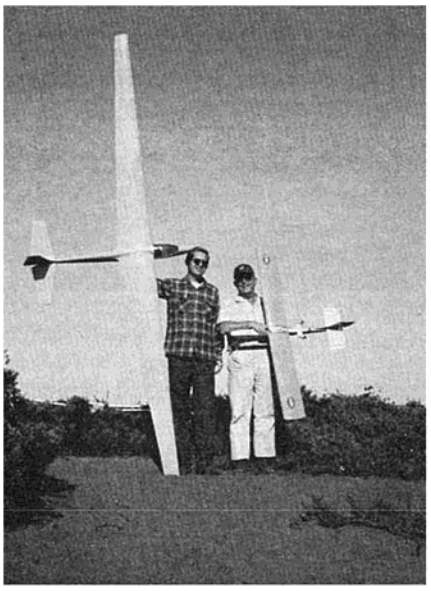
Howard Corbin with Rand Dual Pak equipped Falcon .56. Nice flier.

We Sunday fliers are always impressed by the terrific models which the real pros keep coming up with. So, I thought I'd include a shot of Jerry Nelson with his latest creation — another Cub. Note the difference from Ed Ames' in that Jerry has virtually no dihedral in his model, and has added a feature which, if memory serves me right, was not available on the original. I refer, of course, to the flaps which are evident in the photo. But you should see this airplane fly! It is as near to having scale like performance as any model I've ever seen.

And speaking of "scale like" performance, that brings up a point that is really getting a lot of attention. Scale like appearance is one thing — lots of models have that. But scale like performance, — that's something else. Most scale models,

Floyd Carter and Antoinette #7 1909 vintage. 72" span, Veco .45, F&M radio.

*(Continued on Page 8 )*



Jerry Nelson and Ken Willard with the "long and short of it."

when they fly, do not have "scale" performance. Instead, they fly at a scale speed which is two or three times faster than the model they are supposed to represent, thus destroying the illusion of scale. Also, to get full scale flying points, under the present system, some scale models are called upon to do things which the original could not perform! Let's take an extreme case. Say, for instance, that Floyd Carter was scheduled to fly his Antoinette after having been judged for scale appearance. The wind has come up, and is blowing about twelve miles per hour — not a problem to a modern contest job. So he goes up to the judges and says, "The wind is blowing 12 miles per hour. That is equal to a wind of 84 miles an hour for the original Antoinette, and no pilot in his right mind would try to fly under those conditions, therefore I decline to fly." Should he be disqualified? Or should he be given full scale points for a logical pilot's decision?

•

Finally, let me wind up this month with some observations on galloping ghost — the modern version of "poor man's multi."

I've been doing some flying with Tom Gilmore with his Top Dawg with the Rand GG Pak installation. It has taught me a couple of things. First, if you'll look at the photo, you'll note the larger rudder than appears on the plans. Although the standard size rudder works all right, it was a compromise for those of you who planned to use single channel servos. Since the effective rudder throw when you use galloping ghost is only one half of the total throw, due to the constant pulsing, you can get a much better rudder action by increasing the area to compensate for this fact. The other thing you can note is that the elevator area has been cut in half. Here the reason is that up elevator is achieved by reducing the pulse rate, and if the standard width elevator is used, then when up elevator is applied it creates a noticable oscillation in the flight path.

In contrast to Tom's model with the GG Pak is Howard Corbin's Falcon 56 with the new Dual Pak installed. Here you have a pulse rate much higher (neutral is at 16 pulses per second as compared to 6 for the GG Pak) so the surfaces seem to quiver rather than pulse. It makes a great difference in the way the model flies through a loop, for example, and the elimination of the violent up elevator action when motor control is applied is definitely an advantage for a newcomer. But you have to be sure that the transmitter is matched to the receiver and the Dual Pak to get maximum benefit. And most newcomers have to depend on the manufacturer of the equipment for that feature, because trying to match a transmitter and receiver isn't something to be undertaken unless you have the right equipment. So my advice is — don't try it.

If it doesn't work right, and you've paid somewhere around $150 to $180 for the rig, you're entitled to have it fixed — and at no charge, unless you've made the mistake of trying to fix it yourself and in the process you've fouled up all the settings so it takes a major realignment just to get it to work at all. The manufacturer will be able to tell if this is the case, so don't try to snow him. Conversely, though, if you haven't messed around with the gear, yet it doesn't work right, and you send it back for adjustment, and the manufacturer sends it back to you with a note that major repair was required, and the bill is $28 plus $3 for postage, let us know. We'll be glad to check into it.

As you can see, this has been a busy month — slope soaring, vintage airplanes, galloping ghost, and scale. Meanwhile, some things have been happening in the industry that may change our outlook considerably. As I write this, I have just been informed that balsa prices are going to go up a fantastic rate of 45% early in 1968. Next month we'll look into ways to offset this incredible jump in price through the use of other materials.

There's more than one way to skin a cat, as the saying goes. And it's equally true for wings and stabs.

Check with me next month.

Ed Ames with his 54" span, 6½ lb. Cub. .135 power.

## EDITOR'S MEMO

*(Continued from Page 5)*

gear as opposed to tricycle gear. We all know that with conventional gear you have to work considerably harder on take-off and landing. The airplane is very fast, which I believe was also brought out in the article, and is relatively hard to see unless you bring it right down on top of the judges. Well, I would have brought it down on top of judges had I had a little more time on it. However, as I stated earlier I was not used to this particular model yet. Considering all things, I still feel that I proved my point with the Chipmunk.

I would like you to print this letter if you would and get across to the R/C'ers in the United States that the Chipmunk is a damn nice flying airplane, and I think almost anyone of them would enjoy building and flying it. It's a real ball.

Well, Don, thanks a lot for letting me get this off my chest and would appreciate anything you can do with this.

Best Regards,
Cliff Weirick

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This month's cover is a Kodachrome X transparency of Lt. Robert S. Violett, USN, of Hyattsville, Maryland, and two of his models — his own version of an "Aeromaster" bipe painted up like a semi-scale Pre-WWII trainer, and an original Class III ship. The ship in the background is an A-FH Skyhawk belonging to Bob's Attack Squadron 93 which recently returned from a Vietnam cruise aboard the USS Hancock CVA19.


AMA 40895

*Winner of the 1967 Toledo Conference Best Original Design Trophy, the Swelta will be a sure-fire hit at the local flying field. By Dr. Harry Hodel. Photographs by Reynolds.*

# SWELTA

SOONER or later, every long-term modeler will try his hand at designing an airplane. We all do a little of this by making minor modifications of pre-existing designs. This has resulted in the present trend of look-alikes. There comes a time however, when each of us would like a unique original design which should at least look pretty — and hopefully be able to fly well. The resulting appearance will no doubt be a culmination of his past experience and his concept of what his "dream" should look like.

Whether or not it flies well, is not of prime importance because all his other planes are able to do just that. But imagine his thrill, if it does perform well after he gets enough courage to try it out!

This is how my "Swelta" was conceived.

To begin with, this design was never intended to be just another class III contest machine because we already have so many excellent designs to choose from. What I desired was a unique plane, unlike any other, yet pleasing to the eye. I liked the appearance of Delta wings but they lacked beauty without a fuselage. They also lacked some of the favorable characteristics of the conventional designs. By the addition of a fuselage, the favorable characteristics of both types could be combined. Previously, whenever this was done, the motor was always placed aft with a pusher prop, to solve the placement of the C. G. This detracted from the appearance and also required special structural reinforcements.

I feel I have achieved my goal by solving these problems.

So what is unique about the "Swelta"? Appearance for one. It almost looks like a navy jet fighter. The way it flies is another. I have never had a model stir so much interest in spectators and modelers alike. Rarely have I seen a model hold a crowd so spellbound. What more could I ask for? It handles as easily as most class III planes, yet is able to fly much slower because of the reduced stalling speed. The Delta wing permits the model to be easily landed in a nose-high attitude without any tendency to fall off. This adds realism. Maneuvers are smooth and control response is positive at all speed ranges. Rolls are very axial and breathtaking to behold! Because of this feature, a low pass ending in a victory roll is one of the Swelta's most spectacular maneuvers.

The addition of a tail section produced another feature — namely the ability to do true tail spins. I have yet to see a Delta capable of this. Inverted stability is unexcelled since there is virtually no difference in control response. Rev up that engine and it streaks across the sky! This is fun! Sort of anti-climatic to the encouragement my fellow modelers expressed during preflight stages such as "It will never get off the ground" and "What is it?"

Where did the name come from?

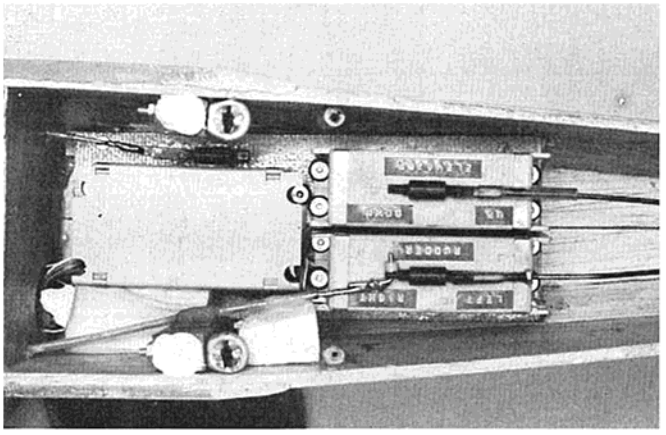
SWEpt back + deLTA = SWELTA. That is just what it is. There are several interesting design features incorporated into this plane. The wing differs markedly from most delta wings, which have one thing in common. They employ a double reflexed airfoil, which imparts a positive pitching moment, thereby creating lift. This was not necessary for the Swelta because it has a tail section. The wing, therefore, is fully symmetrical! Although it is almost 4" thick, the airfoil is still only 12%. Even though I'm an avid barn-door enthusiast, I felt that because of the reduced wing span I would need all the aileron action I could get. I therefore used full-span ailerons. They were so effective that their size had to be reduced.

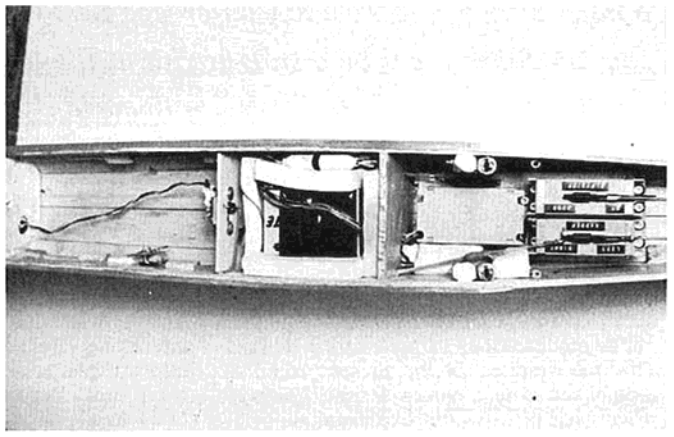
One major problem was the fuselage length, since this is mainly dictated by the chord section at the center of the wing, plus eight inches of length which are required in front for the engine, tank and nose-wheel. Adding this to the tail moment, which I established by preference, results in a long body. My final plans are smaller than the originals. When you have a heavy engine and a full 12 oz. tank a long distance ahead of the C. G. there must be some compensation in weight distribution to keep the balance point where it is desired. This was accomplished by placing the servos just in front of the stabilizer. (Yes — the push-rods are very short). I felt that it was virtually impossible to build a tail-heavy "Swelta" so I compensated wherever I could. Much to my amazement I overdid it a little. After the first flight I had to move the batteries ahead somewhat — only eighteen inches. What an improvement! By the time I made all the necessary trim adjustments, many unimpressive flights were logged.

The tail-section was easily decided upon, since a standard percentage of the wing was used for the fin and stabilizer. This results in a large fin but appropriate for the type of airplane. The fact that the elevators also sweep back, does not pose a problem, since complex linkage is unnecessary to connect both sides. I simply used heavy Speedometer cable, which permits no torque, yet easily flexes around the angle to connect both halves. (See Detail.)

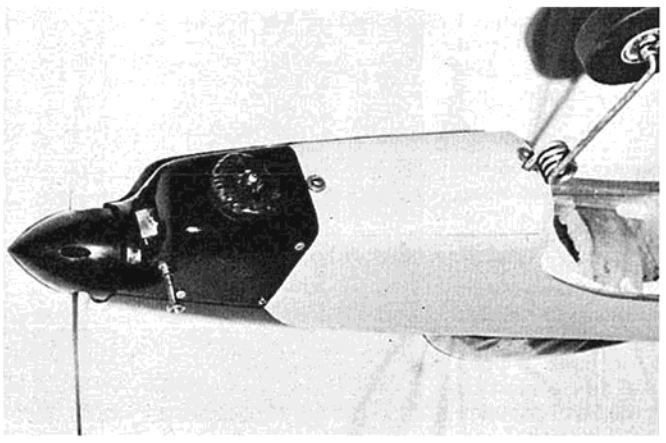
Construction is actually simple since the fuselage is built upside down á la Kwik-Fli style. This greatly simplifies building and saves time. We'll start with the wing so that the fuselage can be "custom fit" to the wing more precisely. Keep everything as light as possible. The first time, I built everything as strong as possible. I also added my special "2-inch thick" finish resulting in a ten-pounder.

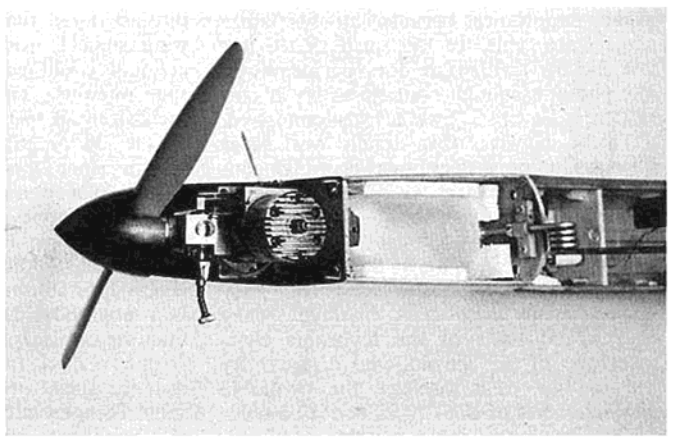
WING CONSTRUCTION: I constructed my wing using styrofoam techniques. This makes for a true wing and eliminates the necessity for cutting various sized ribs. The





Hatches and wing are removed to demonstrate details of servos, receiver, cam-locks and pushrods. Note hatch dowels behind cam-locks.





Details of the engine, tank and nose wheel with and without cowl.

dimensions for the root and tip ribs are shown. These are constructed of plywood or more preferably aluminum. Mark the numbers as shown to facilitate cutting. They are positioned proportionately so that the wing remains true. If you are unable to obtain four-inch styrofoam, simply spot glue two sheets of two-inch together and cut the wing from this piece. Core out the wing if you want it lighter. If you are unable to cut wings yourself, you must find an obliging friend or a commercial source. You could, conceivably, build a conventional wing with ribs.

Make the cutouts for the landing gear blocks and plywood inserts for the Cam-Locks. Epoxy glue these in place. Cut a groove in the bottom surface for the aileron cable. You will find that the use of bicycle brake cable, plus nylon tubing for housing, eliminates many alignment problems as well as the necessity for 90° bellcranks. This linkage has less play and slop and has the added advantage of being easily installed. Bring the cable through the surface two inches from the trailing edge at the bottom. Now sheet both wing panels with 1/16" balsa and make the cut-out for the servo compartment. Make certain the dihedral cuts are correct to fit as described below, then glue both wing halves together with epoxy glue. This is done by placing the panels on a flat surface and keeping the bottom surfaces flat at the trailing edges. The result is a slight dihedral. No dihedral braces are required. Wax paper will keep the wing from becoming a permanent fixture on your table top. Use a truly flat surface so you will have a true wing.

Cut off the front tip as shown on the plans and add the 1/8" plywood front-plate and dowels using epoxy glue. Now fiberglass the center section using fine cloth on the undersurface and a heavy 3" strip on top (this will be hidden by the fuselage).

Plug the nylon tubing with wooden toothpicks for finishing the wing the way you desire. Add the ailerons using nylon hinges. Use the nylon control horns backwards as shown to provide differential in aileron throw. Check the plans for this. Add the Cam-Locks as shown on the plans.

**Fuselage Construction** Begin with the top block. The additional piece is glued at the tail-end. Make the cut-out for the stabilizer. Draw a straight centerline on the bottom (inside) surface and mark the position of the bulkheads. The bulkheads have a matching centerline, which is placed on the line of the top-block and glued. The 1/2" triangular longerons are also glued in place (pins hold everything down). The motor mounts are epoxy-glued to the 3/16" sides and these are then glued to the entire framework. Let everything dry. Locate the blind mounting nuts for the motor, then add the filler blocks at the nose. Shape the nose to the spinner and round the top-block of the entire fuselage. Sand smooth. Glue the stabilizer in place and add the fin. Fiberglass the nose-section and construct the fiberglass cowl. If you cannot make a fiberglass cowl you may have to make the fuselage sides longer.

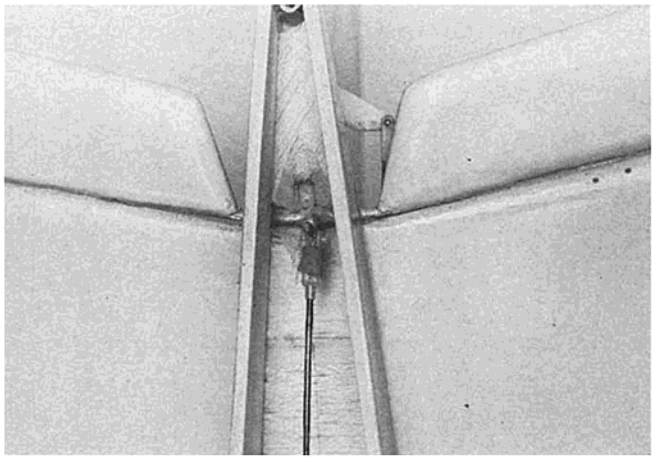
The hatches are constructed with the grain of the balsa going tranversely. The inset pieces have the grain running longitudinally. 4-40 bolts are screwed into dowels which have been drilled, tapped and glued to the fuselage sides, to hold the hatches down.

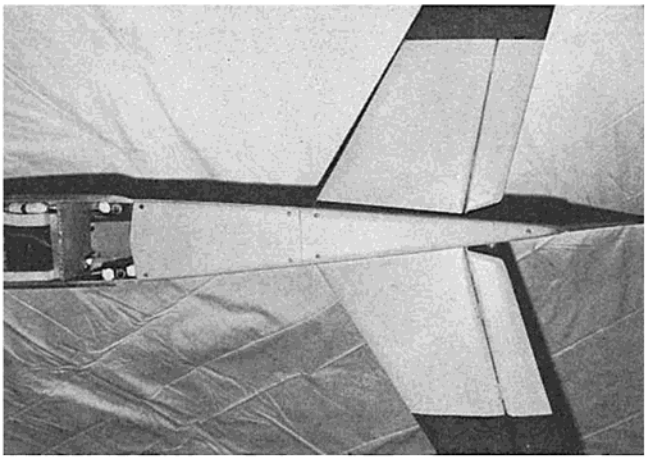
After fitting the wing, drill matching holes for the wing dowels. Fasten the Cam-Locks and finish the structure to your own taste. Equipment is installed in the areas shown. There is adequate room for anything! The elevator and rudder are attached with nylon hinges. The elevator horn is constructed of standard speedometer cable using solder as shown. Do not run the solder along the entire length or the cable cannot flex. This works extremely free, yet permits no twisting between both sides.

I used an Enya 60 which provides adequate power, but any hot .61 would really make this baby move out. Bicycle brake cable is also used for the motor control.

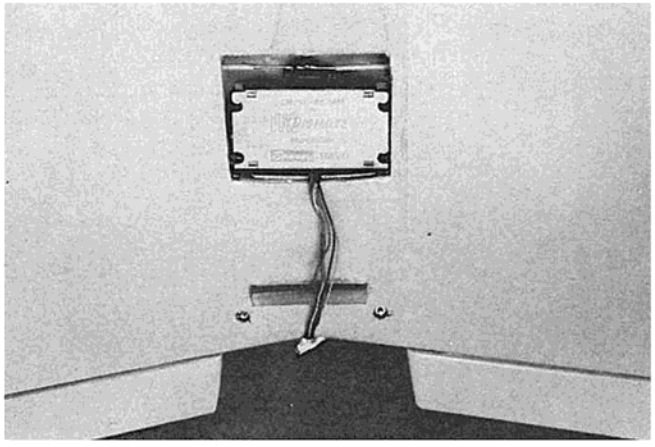
The tank compartment is large enough to fit a 12 oz. square plastic tank. The

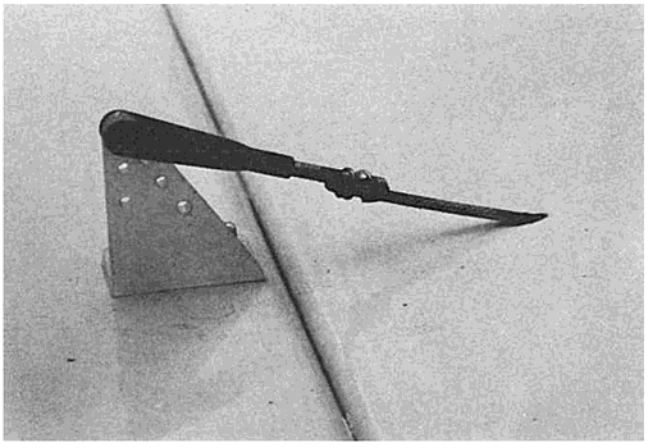
*(Continued on Page* **15***)*



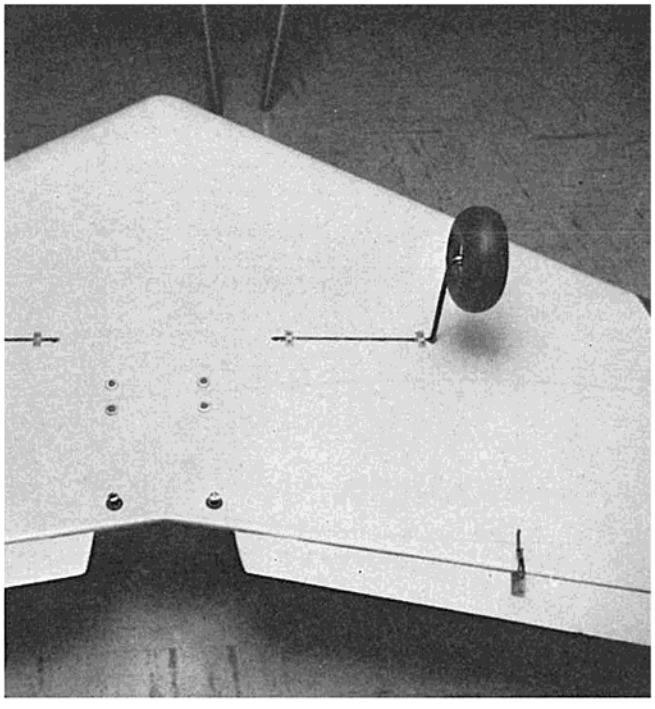


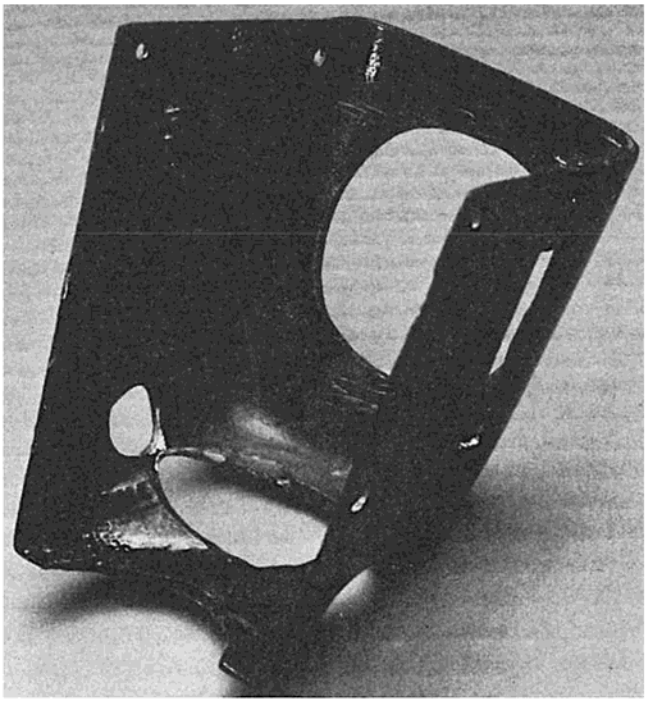
**Rear hatches with positions of hold down bolts. Hatch is removed at left to show details of special "cable elevator horn" and hook-up.**



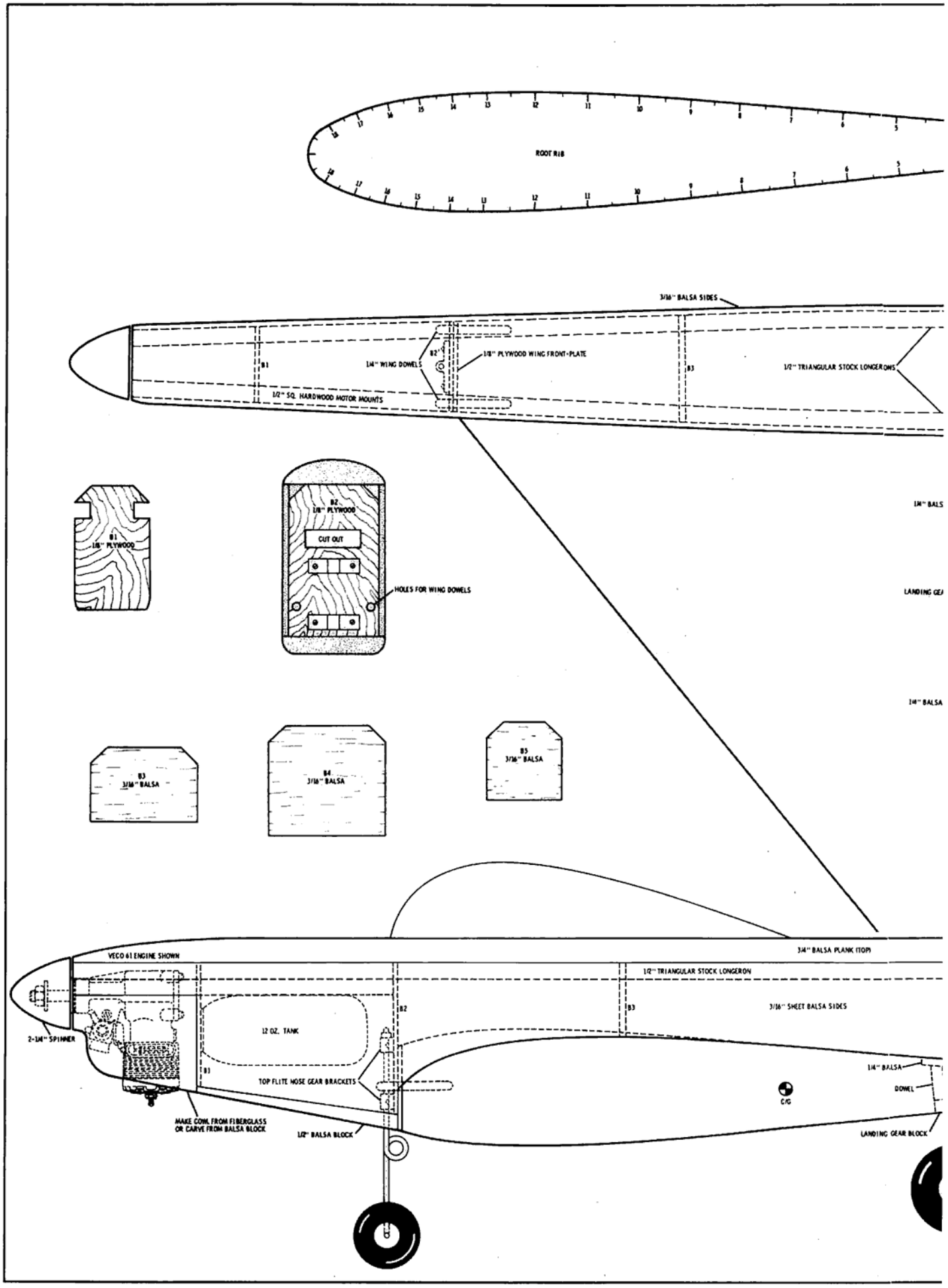


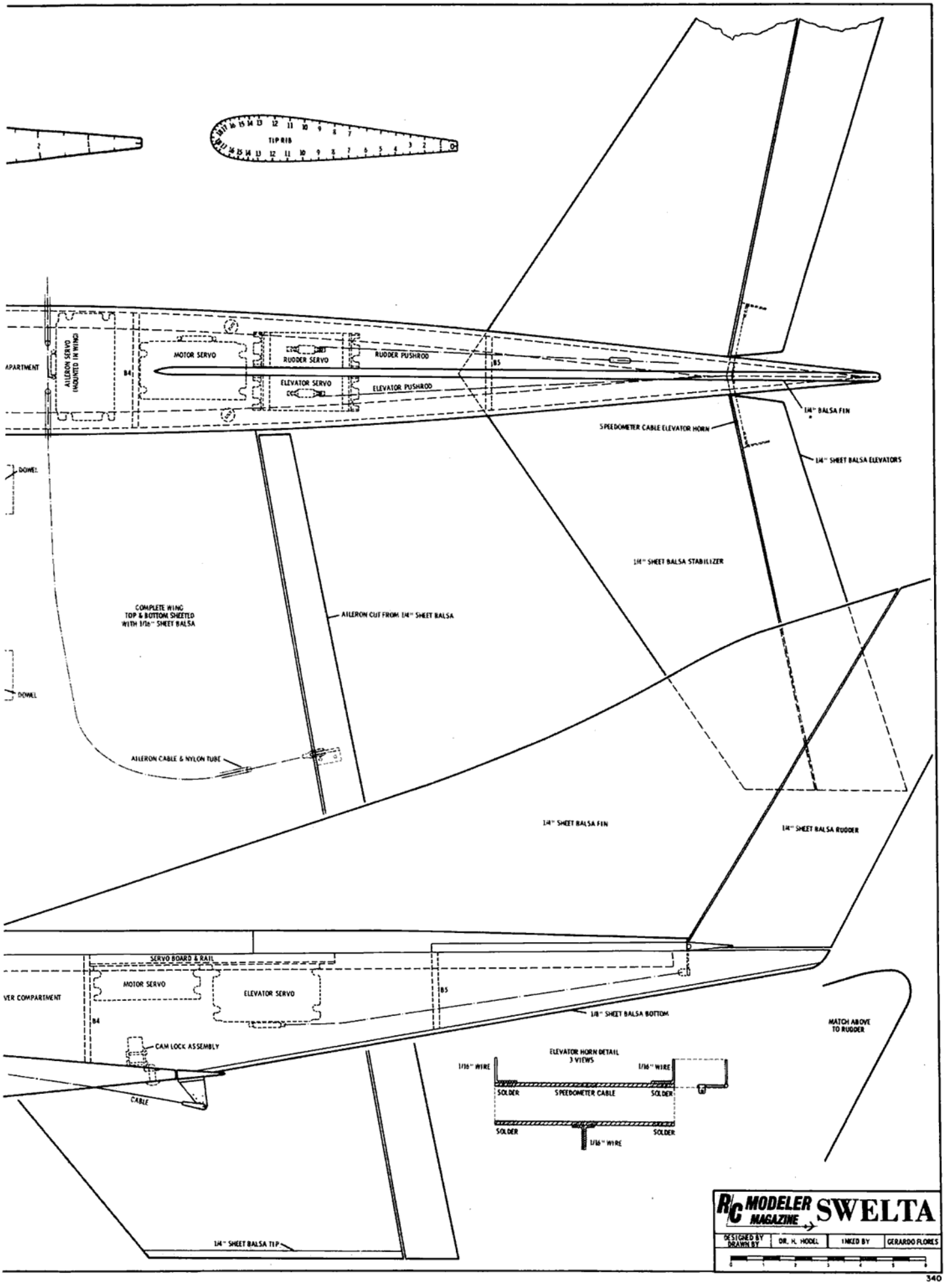
**Aileron servo and cam locks shown in detail. Note nylon cable. Hook up is soldered to cable. Right: Aileron horn shown in detail. A 2-56 bolt is soldered to the cable coming from the wing. Note the Kwik-link hooked to the sloping surface of the nylon horn. Extra holes are drilled on this side. Reversal of the nylon horn provides differential throw to ensure axial rolls.**

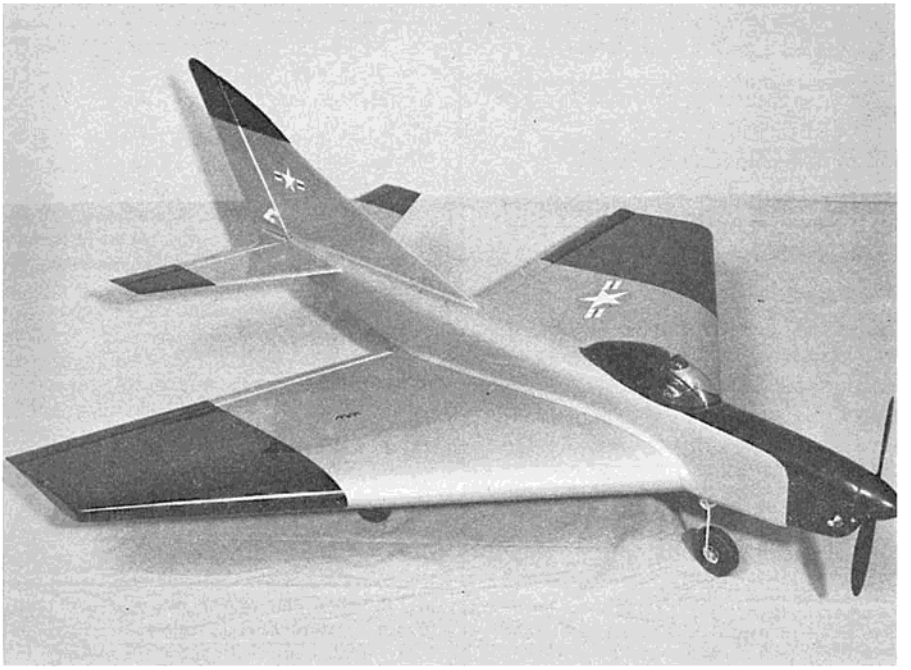




**Under surface of wing showing wheels, cam locks servo mounting bolts and aileron horns. Right: Cowl shown from inside.**


ROOT RIB
3/16" BALSA SIDES
B1
1/4" WING DOWELS
B2
1/8" PLYWOOD WING FRONT-PLATE
B3
1/2" TRIANGULAR STOCK LONGERONS
1/2" SQ. HARDWOOD MOTOR MOUNTS
B1
1/8" PLYWOOD
B2
1/8" PLYWOOD
CUT OUT
HOLES FOR WING DOWELS
B3
3/16" BALSA
B4
3/16" BALSA
B5
3/16" BALSA
VECO 61 ENGINE SHOWN
3/4" BALSA PLANK (TOP)
1/2" TRIANGULAR STOCK LONGERON
B2
B3
3/16" SHEET BALSA SIDES
2-1/4" SPINNER
12 OZ. TANK
B1
TOP FLITE NOSE GEAR BRACKETS
1/4" BALSA
DOWEL
C/G
MAKE COWL FROM FIBERGLASS
OR CARVE FROM BALSA BLOCK
1/2" BALSA BLOCK
LANDING GEAR BLOCK


TIP RIB
APARTMENT
AILERON SERVO (MOUNTED IN WING)
B4
MOTOR SERVO
RUDDER SERVO
RUDDER PUSHROD
ELEVATOR SERVO
ELEVATOR PUSHROD
B5
1/4" BALSA FIN
SPEEDOMETER CABLE ELEVATOR HORN
1/4" SHEET BALSA ELEVATORS
DOWEL
1/4" SHEET BALSA STABILIZER
COMPLETE WING
TOP & BOTTOM SHEETED
WITH 1/16" SHEET BALSA
AILERON CUT FROM 1/4" SHEET BALSA
DOWEL
AILERON CABLE & NYLON TUBE
1/4" SHEET BALSA FIN
1/4" SHEET BALSA RUDDER
SERVO BOARD & RAIL
VER COMPARTMENT
MOTOR SERVO
ELEVATOR SERVO
B5
B4
1/8" SHEET BALSA BOTTOM
MATCH ABOVE
TO RUDDER
CAM LOCK ASSEMBLY
CABLE
ELEVATOR HORN DETAIL
3 VIEWS
1/16" WIRE
1/16" WIRE
SOLDER
SPEEDOMETER CABLE
SOLDER
SOLDER
SOLDER
1/16" WIRE
1/4" SHEET BALSA TIP
RC MODELER MAGAZINE
SWELTA
DESIGNED BY
DRAWN BY
DR. H. HODEL
INKED BY
GERARDO FLORES
340



## SWELTA

*(Continued from Page* **11**

*"A culmination of past experience and his concept of a dream . . ."*

center of the tank will correspond to the level of the needle valve so that fuel draw will be excellent.

Use Low-Bounce Du-Bro tires for the main wheels and a solid rubber wheel for the nose gear. I used the nose gear from a Tatone motor mount because this has a larger diameter wire and is therefore more sturdy. If you have wheel brakes, add them, by all means. The possibility of retractable gear is appealing, since the wing is thick enough to hide anything. Use brake cable for the steerable nose-wheel.

I believe you should use fillets between the wing and fuselage and the fin and stabilizer. The easiest and cheapest method I know is as follows. Tape Saran-Wrap over the wing making certain it is smooth. Attach the wing to the fuselage. Now mix Hobby Poxy formula II with all the white flour it will take until you have a thick paste. Wipe this paste into the "corner" between the two adjoining surfaces, with your finger so that the radius is round and smooth. Let this cure overnight and in the morning you will realize that the Saran Wrap prevented the wing from being permanently affixed to the fuselage. This material is easily sanded smooth by using a dowel wrapped with sandpaper. The thin excess edges are simply trimmed away with a knife. Now you should be ready for the paint. I used Hobby Poxy paint — platinum for the main color with all tips being red. The nose section is black. (See photographs.)

Just a few more hints. Place the receiver in the separate compartment as indicated. Locate the switch ahead of this point so that the batteries can be moved over a wide range on both sides of the center of gravity. This way you will not have to add weight for ballast, yet obtain adjustment if necessary.

The completed model must have a positive incidence when standing on the ground. The leading edge center of the wing should measure ¾" higher than the trailing edge center.

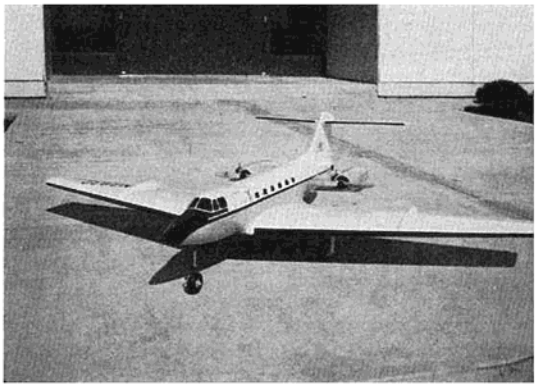
Pretty, isn't it? It will fly like that too, but the first flight can be rough if it is drastically out of trim. If all the surfaces are set at zero and the center of gravity is correctly located, there should be no problem since adjustments will be within the range of the transmitter trim buttons. Proportional is almost a must. It is also preferable to have a well broken-in motor so that you will have all the available power for the first flights. For the first landings you need not reduce power completely. The model will slow down adequately by simply pulling back a little on the elevator stick.

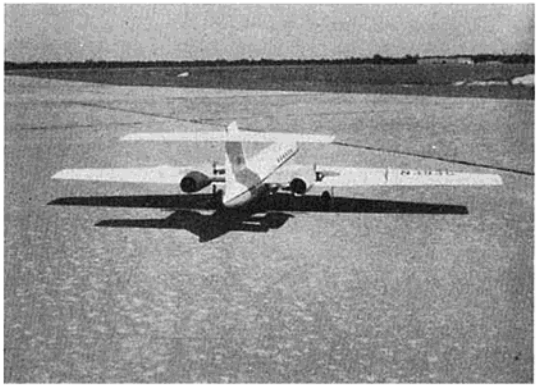
If you are going to taxi around a little before your first flight, be careful to keep the speed down because I was fooled this way and it took off three times — bounced, that is. It will actually lift off at taxi speeds. After you grab altitude, slow it down a bit to get acquainted with the way it handles. You will appreciate this experience for the first landing.

Good Luck!

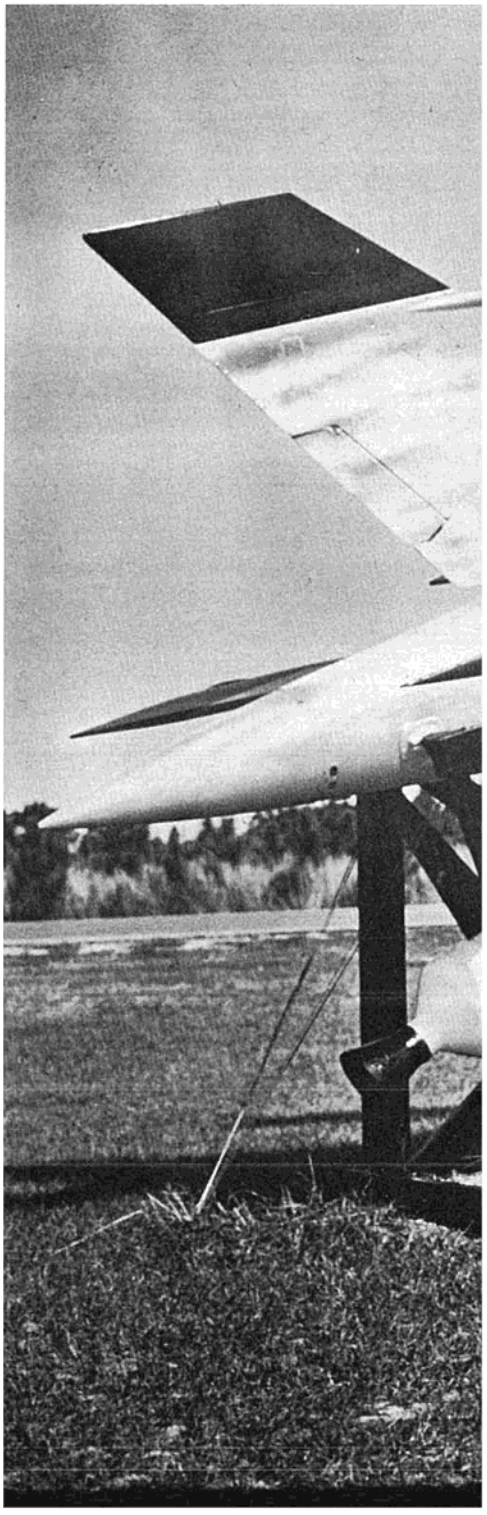
When it came to creating his personal "dream" ship, the author, an F-101 pilot, naturally chose a jet-like aircraft. A composite of the Falcon Jet and Lockheed Jet Star, the B.J. is an unusual R/C aircraft in appearance but with thoroughly proven performance.

# major john





In keeping with its space-age design, the construction is of 80% Styrofoam, 10% desk blotter, and 10% balsa! RCM is proud to present this outstanding design effort for twin .19's and proportional.



# oods' twin Business Jet

LET me begin this article the same way that so many others have been started and say this airplane is **not** recommended for the beginner in R/C. I know that every beginner wants a 9′ multi-engined, retract gear, swept-wing Thing-a-ma-jig with flaps, working cockpit controls, lights and just a few more things that will come to mind while he is building his DREAM. Well fellows, that's all the foregoing is — a dream, and this model is definitely **not** for the beginner! I will concede that "B. J." is my dream ship but you will notice that it is neither a nine footer nor the extremely complicated model described above.

Let me digress here for a few lines and bring you up to date on just how a project of this kind got started in the first place. I started in this sport in 1952 after outgrowing model airplanes as a teenager. I got too old for it in 1945 when I was 17 years old. I again became fascinated by the prospect of building and flying a model airplane after I finished college and went to work in Geophysics for The Standard Oil Company of California in Turlock. A geologist and myself bought and built two Berkley Bootstraps and a Berkley Airtrol Transmitter, Hard Tube Receiver and Escapement. How many of you remember **that** rig?? Believe it or not, many happy hours were spent flying both of those airplanes — swapping equipment back and forth so both of our creations could float gracefully around in the wide blue sky. From there, Jack Cunningham the geologist, and I progressed through several airplanes and updated our equipment until I left the Seismic Oil Exploration crew and joined the Air Force. I continued in single channel for 10 years before I got the multi bug and upgraded to 10 channel reeds. One and a half years later I graduated to Proportional and to serious design work on my own. To be perfectly honest my early design work was mostly modifications of other modelers' ideas until I branched out on my own — and with a vengeance. My very first multi design effort was a swept wing, "T" tailed, 75% styrofoam airplane I elected to call "Styros." This airplane went through six separate models Styros; I, II, III, IV, V, VI. The last of this series, Styros VI won honorable mention in the first RCM Design Contest and although it was never published it was an above average Class III airplane, very fast wide open, yet docile and easy to land with the power back. Incidentally, I am an F101 pilot so you can see how I got started on the "T" tailed type model airplane in the first place.

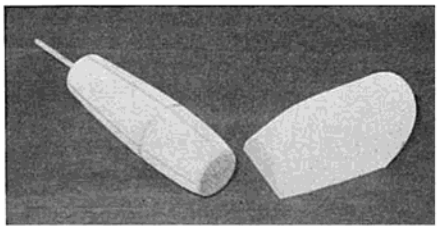
It was at this point that I let **my** personal dream ship ideas overtake me. I wanted a twin; but, at the same time, I didn't want the hazardous single engine performance associated with conventional twin engine airplanes. I had done considerable experimentation with styrofoam techniques, not only for wing and stab use, but fuselages as well. The blotter-styrofoam method of construction was originated by me in 1965 and a small article on its use was published by RCM in the June 1966 issue. It was developed on another more conventional model I designed called "Puffin II." Don't be afraid to try it — the method is tried and proven. It is about as light as normal Class III construction and much stronger. The model I envisioned was a twin engine airplane with a modern "different" look. This ruled out the ordinary scale or scale-like prop driven twins. My research drifted into the jet field but since no practical model jet engines were available I came up with a compromise; a jet-like twin using the Styros developed wing and stab airfoils and the same planform that worked so well on these airplanes. Now the detailed design work on my dream twin began.

The design settled upon was a composite of the Falcon Jet and Lockheed Jet Star, modified to accept the previously finalized moments, areas, airfoils and shape relationships. The fuselage was the only major unit from Styros that needed extensive modification because of the necessity to allow for the engine placement required of a Twin Jet and to make it resemble a Business Jet as much as possible within the confines of the design considerations already settled upon. Thus it was that "B. J." was born. I took a proven airplane, modified it in fuselage shape and engine placement and came up with a very unusual aircraft in appearance but with proven performance. Two problems cropped up because of the location of the engines; balance and fuel draw. The balance problem was solved by locating all of the radio equipment as far forward as possible and by the unusual characteristic of this wing, which allows the CG to be as much as 40% back from the leading edge of the base cord without creating any severe snap roll or tail tuck at the slower speeds. The CG can vary as much as one inch forward of the most aft location indicated on the plan. **DO NOT BALANCE BEHIND THAT POINT.** The fuel draw problem was solved by the use of a heavy rubber bladder tank with two outlet tubes, one for each engine. One unusual aspect of the tank location on this model is that as the fuel burns the CG will move slowly forward instead of rearward and increase the longitudinal stability of the model at landing time rather than decrease it. The second unusual aspect of the model will be brought out in the paragraphs on the fuselage construction. Before you read paragraph one and two and burn your issue of RCM, let me tell you the technique is not as hard as it seems at first. It is a complete departure from the stick, bamboo paper and banana oil school, but it is entirely in keeping with the age of styrofoam wing cores and the Epoxy Glue-Hobby Poxy Paint method of finishing. Another bonus here is the fact that not only does this technique allow you to build a fuselage of any conceivable shape, but do it cheaper, too! With balsa prices going up almost monthly the fact that the fuselage is 80% Styrofoam, 10% Desk Blotter and 10% Balsa should save over half the cost of building it. One more word of caution before you start: Don't attempt to modify the blotter technique. The recommended procedure took two years to develop and works very well as is.

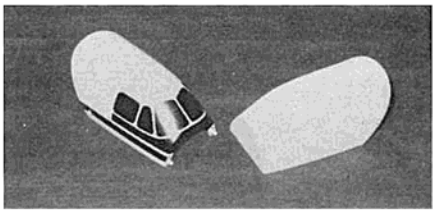
Start with the engine pods. They are made of Hobby Poxy cloth and Formula II glue. Cut two 1/8″ balsa outlines the shape and size of the pods as shown on the plans. Cut a 1/8″ slot one half the distance down the center of one of the pieces starting in front. Cut a slot in the other one, also one half the distance down the center, but starting from the rear. Slide the two pieces together perpendicular to one another so that they form a cross when viewed from the front and glue them together. Take a 1½″ inch thick piece of beaded styrofoam and cut 4 strips wide enough to glue in each of the 4 spaces created by the balsa forms. Cut a 3/32″ balsa ring for the front and rear ends with diameters indicated by the plan. Carefully sand this form to the shape of the two balsa templates glued longitudinally within the 4 styrofoam members. Keep in mind that the pods are circular in cross section at every point from front to rear. The result of this effort is the mold upon which the fiberglass engine pods are formed. I will not go into any more detail on how to construct these other than to refer you to the Pettit Hobby Poxy Easy-Does-It Balloon method for forming fiberglass parts. If you are unfamiliar with the method, a letter to Pettit will elicit a nice illustrated brochure on the procedure. Make two of these and when they are cut from the form, cut them **carefully** on the vertical separation line indicated on the plan with an X-Acto Razor Saw. Cut and finish the front and back holes and set them aside to cure thoroughly — at least 48 hours.

The engine pylon is constructed by taking a 1/4″ piece of medium-hard balsa and cutting it to the shape indicated on the top view of the fuselage. Cut 2 slots in the top side of the leading edge of the pylon at the appropriate locations to accept the fuel lines and the nylon tube that will be the bearing for the single throttle bar that will simultaneously operate both throttles from one nyrod. When the throttle linkage and fuel lines are installed, sheet the top and bottom with 1/16″ medium balsa and sand the leading and trailing edges round.

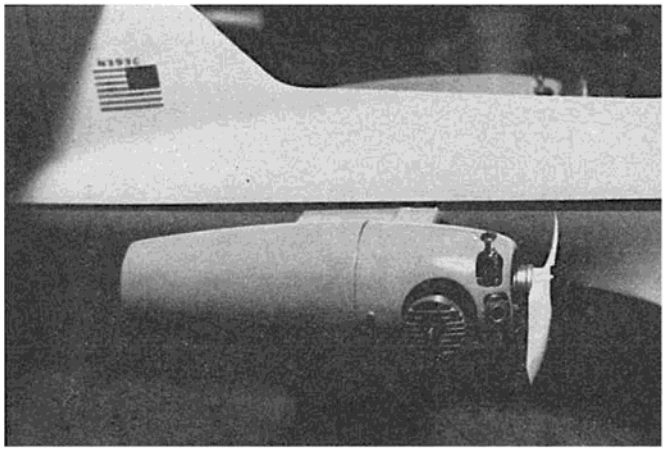
Cut two rings of 3/32″ birch plywood according to the "P3" outlines indicated on the pod detail and cut a slot in the end of the pylon to accept it and glue in place with Franklin Titebond or Epoxy. Cut four aft pod supports and glue them in place on the top and bottom of the pylon behind each plywood ring. Cut the balsa backing for the engine mount plates "P2" and saw a 3/8″ slot through the center of the resulting cylinder. Glue in place in front of "P3." Cap the front of this cylinder with a 1/8″ plywood disk "P1." Cut a 3/8″ slot in the aft inboard portion of the pod so it can be slipped on to the pylon and epoxied in place. Note that the tip of the pylon glues to the inside of the pod and does not stick through either pod on the outboard side. Cut a 3/8″ slot just far enough into the forward pod section to allow it to slide back and meet the aft section forming the



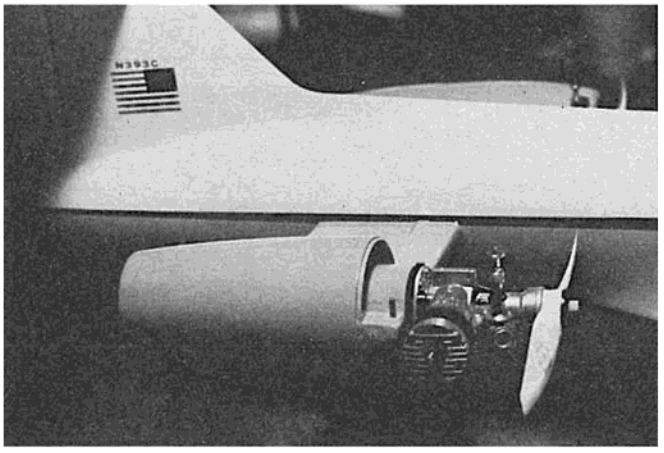
Styrofoam molds for the cabin and engine pods. No, that one on the left is not a banana popsicle.



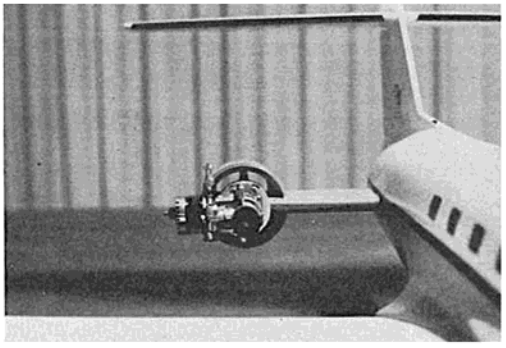
Cabin mold with completed cabin/hatch. Note pegs in front former.



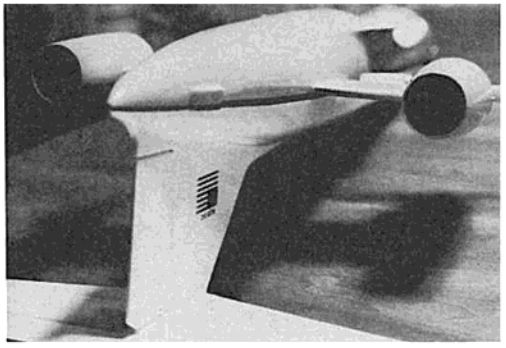
Close up of fiberglass engine pods.



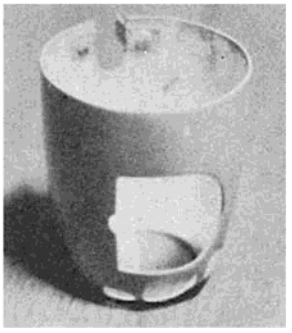
Engine pod showing engine installation.



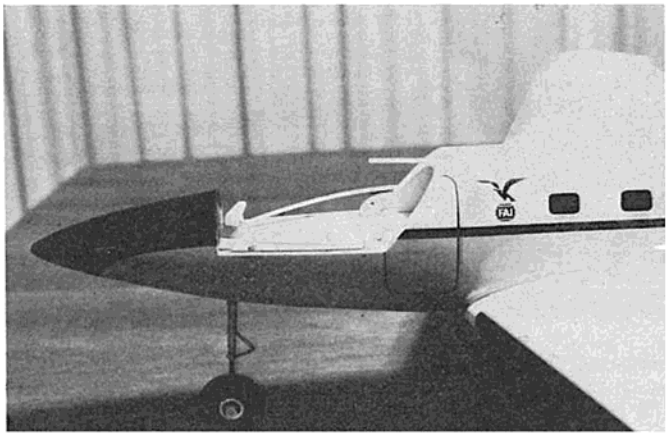
View into the front of the engine pod showing plywood aft pod support behind the engine mount.



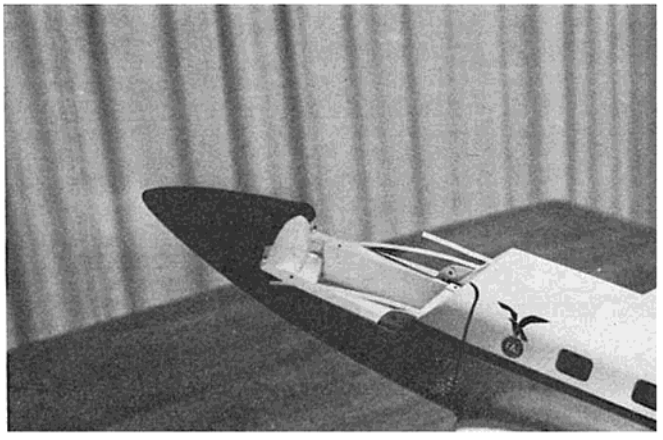
A good view of the Jet-like pipes, aft fuselage area and fillet outline.



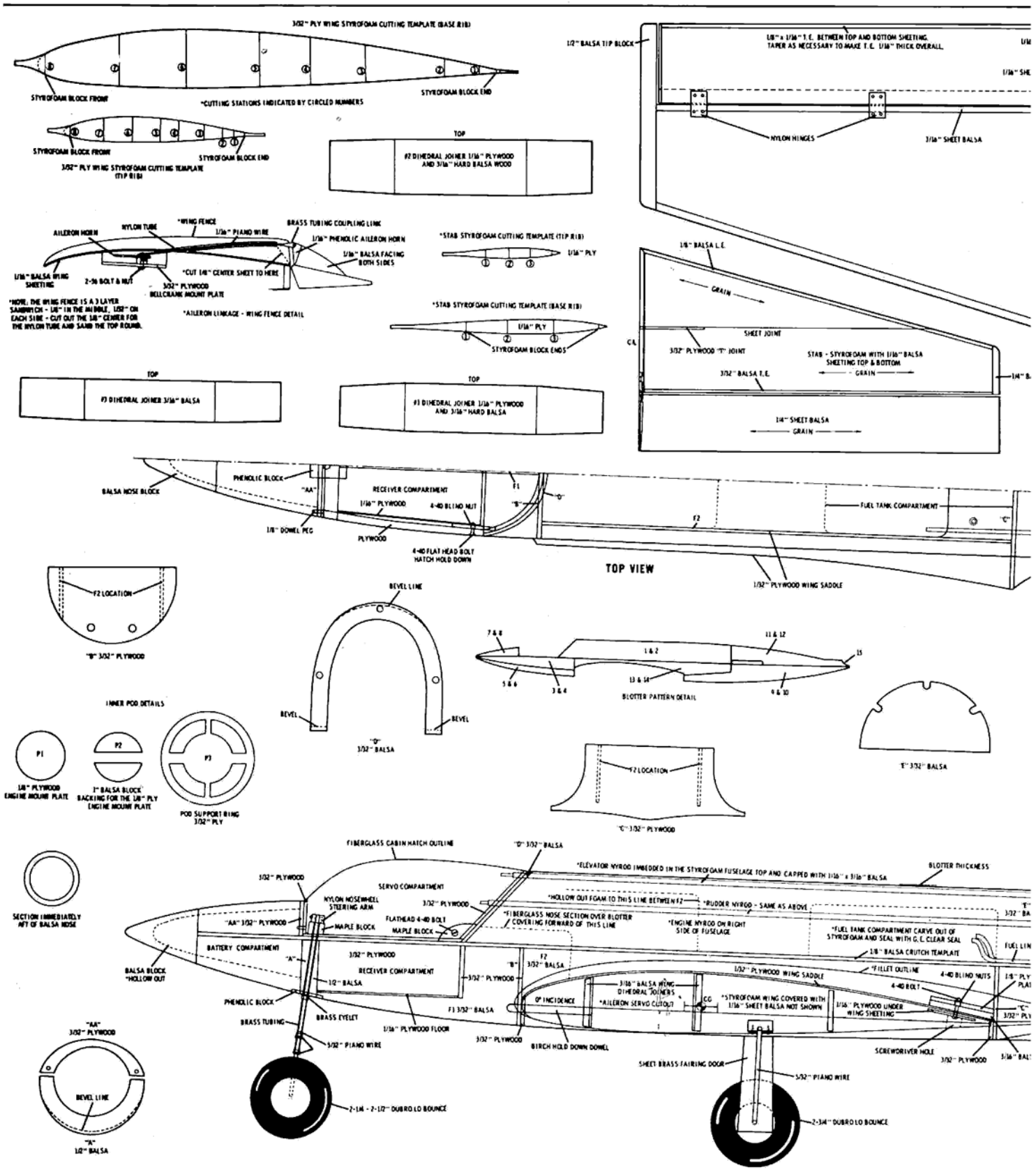
Forward section of engine pod. Notice metal strap hold-down bracket and shape of cut out areas for engine.



Forward fuselage section with cabin/hatch removed. Notice nyrods extending out of upper fuselage bulkhead, the mount plate for the servos and the nose wheel steering arm.

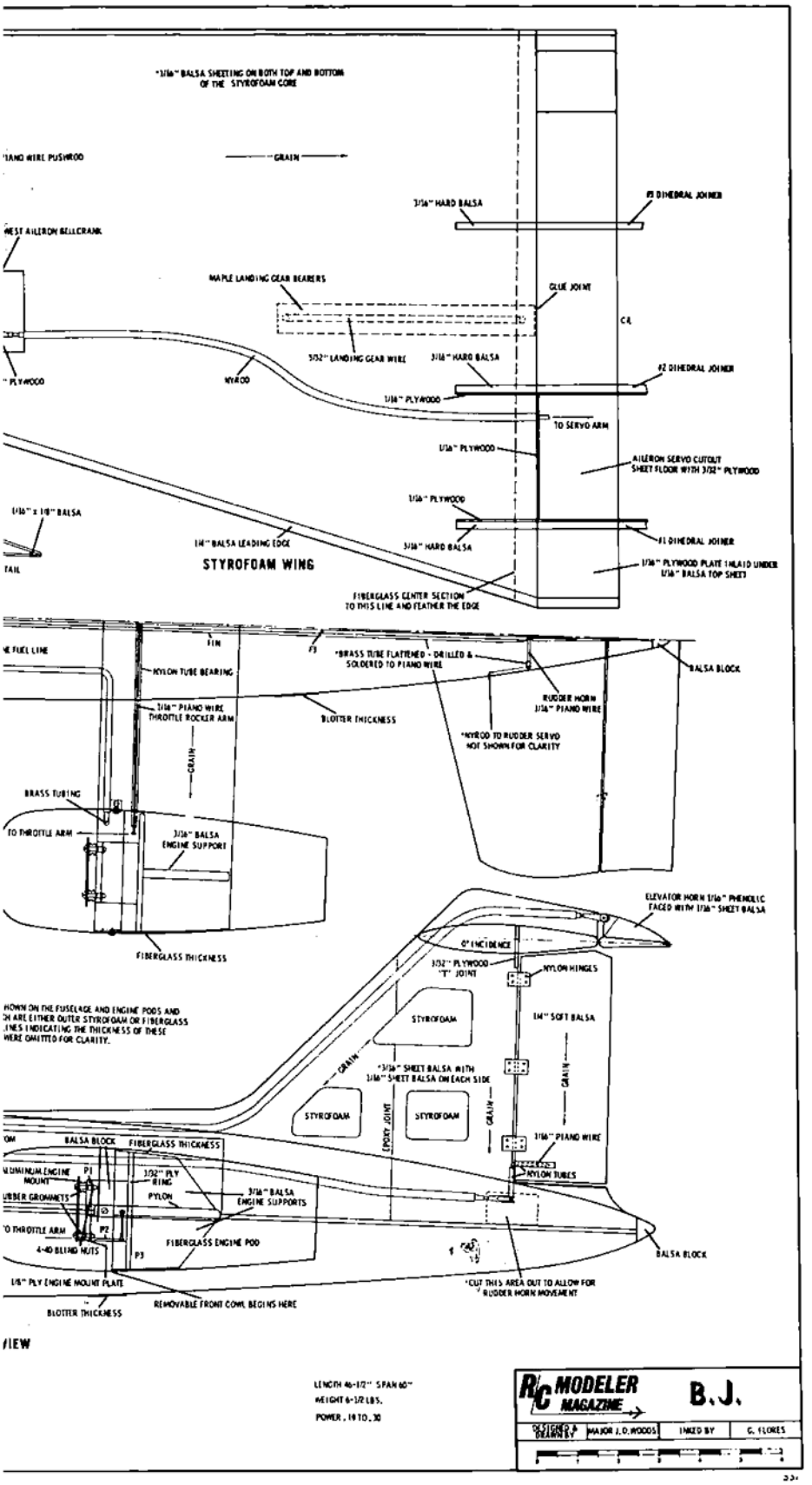


Forward fuselage section with plywood servo mount plate and nose wheel assembly removed. Receiver compartment and battery compartment shows up well here.




complete pod. A small 1/16" plywood ring glued to the inside of the forward and aft sections where they meet will help them retain their circular cross section. The forward section is cut out to accept the selected engine and is held in place on the plyon by a small wood screw, turned into a square of 3/32" plywood inlaid into the tip of the pylon and a 90 degree metal bracket and a 2-56 bolt and nut on the inboard side of each pod. The engines are attached to "P1" with a 1/16" aluminum plate bolted to the rear of the engine crankcases. Notice that there are four grommets separating the aluminum engine mount plates and the 1/8" plywood engine mount. These shock mount the engines and allow some engine thrust adjustments. Be sure to completely fuel proof all surfaces inside of the engine pods.

The fuselage is begun by cutting a full




size piece of 1/8" soft balsa to the outline indicated on the top view. Next, cut bulkheads A, B, C, and fuselage longitudinal members F1, two F2's and F3. Glue A, B and C in place making sure they are vertical and add F1, the F2's and F3. This basic assembly should be built with the large 1/8" balsa sheet cut first pinned to a flat table or board. The bottom half of the fuselage is constructed while it is pinned down to insure proper alignment of the fuselage formers and to be sure the top of the 1/8" sheet will continue to be straight line when viewed from the side. This is important because this line is the longitudinal fuselage reference line and all of the flying surfaces are positioned utilizing it to insure perfect zero-zero alignment. Note also that the engines do not have any side or down thrust. This arrangement has been found to be ideal so please do not experiment in this area. Next cut and fit the six styrofoam blocks to fit in the spaces created by the assembly of the balsa parts. The styrofoam can be cut by hot wire or sawn, but be sure the cut angles are 90 degrees so they will fit precisely against the formers already in place. Any adhesive suitable for styrofoam can be used to glue it down, but Franklin Titebond used sparingly is recommended; sparingly to avoid weight buildup. Also, be sure the styrofoam placed against F2 and F3 is wide enough to allow it to come all the way out the fillet tip — the ends of former "C." When this is dry, cut out the wing saddle with a hot wire cutter and using the two F2 formers as a guide. Cut the wing saddle/fillet base from 1/32" plywood and glue in place against the bottom of F2. Remove from the table and shape the styrofoam using A, B, C, the longitudinal fuselage members and the fillet base as sanding guides. Start with heavy sandpaper first, grading down to fine. Be sure to sand the aft fillet contour to the shape and at the angle indicated by both the top and side views on the plan. Glue the balsa and 1/8" plywood wing hold down plates in place beneath the aft portion of the 1/32" ply fillet base. The result of all this effort should produce the whole bottom half of the fuselage including the fillets. To build the top half take the engine pod assembly and glue it in place on the top of the bottom half of the fuselage at the location indicated. Be sure this assembly is aligned perfectly or you will have the engines canted — one toward and one away from the fuselage. Next, cut bulkheads D & E. Glue E in place behind the pod assembly. Cut a large styrofoam block to fit between D & E, be sure to cut the front of the block to the angle shown on the side view. Glue it down and then glue D in place on the angled face of the foam. Sand this foam block to shape, using D & E as sanding guides. Also keep in mind the top edge of this block is a straight line and be careful not to sand it sway back. The vertical fin is built next and while it is a fairly simple job, a pointer or two will keep things straight for you. Cut the full fin outline from 3/16" medium sheet balsa and cut or saw out the lightening areas to the patterns shown. Cut out two 1/16" sheet fin sides, also to the full outline. The 3/16" sheet balsa fin sides have the grain running horizontally to increase the twist strength and provide a stronger support for the elevator. Fill the lightening holes in the rudder with 3/16" sheet styrofoam and cut the channel for the elevator nyrod along the leading edge of the 3/16" balsa fin. Glue this to the aft part of the fuselage, being careful to center it allowing for the other 1/16" fin side to be installed later. Glue the large nyrod tube in the channel and lay it in a like sized channel cut along the top of the foam block between D & E, deep enough to allow a 1/16" x 3/16" balsa strip to be inlaid over it along the top of the fuselage. To complete the fin, glue the other 1/16" fin side in place and sand the edges round.

*(Continued on Page* **22***)*

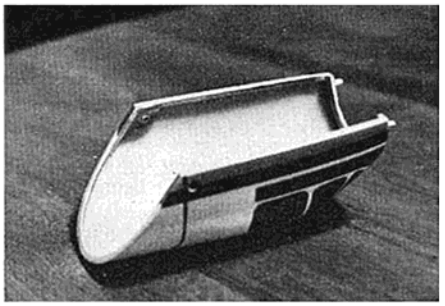
## B.J.

*(Continued from Page 21)*

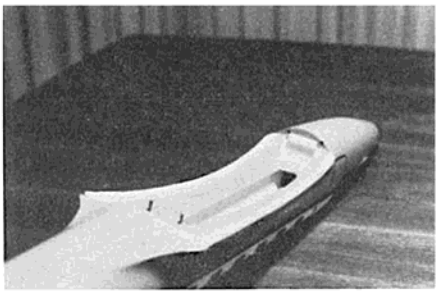
Next, add the styrofoam block forward of bulkhead "A" and the soft balsa block forward of that. Cut and glue former "AA" in place behind the styrofoam nose block and against the top of the 1/8" balsa fuselage crutch. Sand the nose section to shape. Carve out the battery hole in the foam nose all the way to the balsa tip block. Also, carve out the receiver compartment in the aft, lower nose styrofoam block between bulkheads "A" and "B" and sheet the floor and sides with 1/16" plywood. Cut the engine and rudder nyrod slots along the sides of the foam block between D & E; rudder on the left and engine on the right. Glue them in place, again deep enough to run a strip of 1/16" x 3/16" balsa over it and flush with the foam in a manner similar to the way the elevator nyrod was installed. Insert the inner nyrod tube in each of these large tubes and hook them up to the rudder horn and engine horn in any permanent manner that will not give you any later trouble because they are to be completely enclosed in the foam. Kwik Links are shown on the plan and work well for this purpose. Cut two foam blocks large enough to fill the areas on either side of the vertical fin, cut out slots in both of these large enough to allow free movement of the engine and rudder horns within the foam blocks. Glue them in shape and sand to shape. Be sure to sand a slight fillet between the fin and fuselage. You are now ready for the final fuselage construction step — the blotter covering. Start with the center skins, first cut a piece of desk blotter from the 24" x 30" white blotter that can be bought from virtually any stationery store, use green if you can't get white. Make sure that the skins are cut generously oversized. Wet them under the faucet and place on a thick section of newspaper for a few seconds to soak out the excess water. Carefully place it on the fuselage, patting and pushing it into position. DO NOT RUB. If the blotter is rubbed when wet it will roll up and degrade the final product. Use an indelible pencil and a very flexible plastic ruler to mark the cut lines on the wet blotter. In this case — down the center or spine along the top, along the edge of the fillet and vertically around the fuselage in front of and behind the fillet. Remove the blotter carefully because it tears easily while it is wet. Cut the wet blotter along the marked lines with a sharp pair of scissors. Brush white glue on the foam with a small plumbers' flux brush as thinly as possible. Coat only the area that the blotter will cover and don't let any blobs of glue come up on the surface of the blotter during a later step. Now, carefully place the blotter back on the fuselage in exactly the same position that it was when it was marked. Pat the blotter down firmly with your hand and fingers without rubbing. Make sure it conforms to each and every contour of the fuselage. If you find it necessary to trim the wet blotter after it is in place, hold the edge firmly down with a ruler and slowly cut along the edge of the ruler with a sharp **round** blade using the rounded edge, not the tip. Use a firm sawing motion. If this doesn't appeal to you it can be trimmed more easily after it has dried. Edges needing feathering or thinning can be sanded when dry, before the first coat of Epoxy II is applied. Allowing to dry **thoroughly**.

Mix some Hobby Poxy II glue and brush into the dry blotter. Use care to see that the glue does not run over the edges and restrict the butt joining of subsequent pieces of blotter. Note that each skin is placed on the fuselage and the first coat of Epoxy glue is applied and allowed to cure before the next one is applied. Do this for each of the pieces in the order indicated by the numbers on the small drawing of the fuselage side profile. The reason for doing each skin one at a time will become apparent when the #2 skin is placed on the fuselage wet. If the Epoxy was not put on #1 previously and allowed to cure, water in the blotter would wet the one already glued down and it would nearly be impossible to find the edge of the #1 skin. Convinced? Go on through the whole fuselage waiting for each one to cure before going on to the next. When you have finished the skins, sand any edges and joints needing it and lightly sand the fuzz off the surface of the epoxied blotter. Coat the fin with Epoxy II glue and sand it in the same manner as the rest of the fuselage.

**ELEVATOR**: Build it in the usual manner that a foam stab is built. Sheet with 1/16" balsa and Epoxy a 3/32" plywood "T" brace at the junction of the hinge line of the rudder and the under surface of the stab. Relieve the hinge line to accept the tongue of the "T" brace and cut a slot 5/16" wide forward from this brace to the apex of the leading edge of the stab. Slide the stab into place on the fin, making certain it is exactly "0" with the longitudinal axis of the fuselage and epoxy in place. Brush one coat of Epoxy II glue on the stab after it cures and sand lightly. Mix coat the entire fuselage and empanage assembly a second time and allow to cure thoroughly. Don't be stingy with this coat of glue. Sand smooth, using medium grade garnet sandpaper to start and two finer grades of garnet paper finishing up with 280 silicone carbide No Fil paper. Fill any imperfections with small amount of Formula II secondarily finishing as indicated above. Cut a piece of foam to fit between A and D and sand to the shape of the cabin. Face the front, rear and bottom with 1/16" ply and use this mold and the Hobby Poxy Easy-Does-It method to make a cabin-hatch to cover the equipment well in the forward part of the fuselage. When this section is cured completely, remove from the mold and trim. Cut 3/32" plywood reinforcement edging to fit the front back and bottom of the cabin-hatch 1/4" wide and glue in place. Recommended hold down for the hatch is similar to the standard peg and screw wing hold down used commonly on many Class III airplanes. This is shown in detail in the photos, so no further explanation will be attempted here. The elevator and rudder should now be cut out of 1/4" medium-soft balsa sanded to the airfoil shape shown on the plan and finished the same way as the fin and stab. An alternate method of finishing the wood parts is to brush two coats of Hobby Poxy Clear — not clear dope —on the wood and sand lightly after allowing each coat 24 hours to dry in a warm room. Then apply a coat of Formula II glue, finishing as previously described.



Close-up of the underside of the cabin/hatch — note 3/32" ply reinforcement completely around the edge of the fiberglass and the maple blocks that support the countersunk 4-40 bolt hatch holddowns.



Wing saddle well detailed by this close-up of the center of the fuselage with the wing removed. Note the 4-40 bolt wing holddowns.

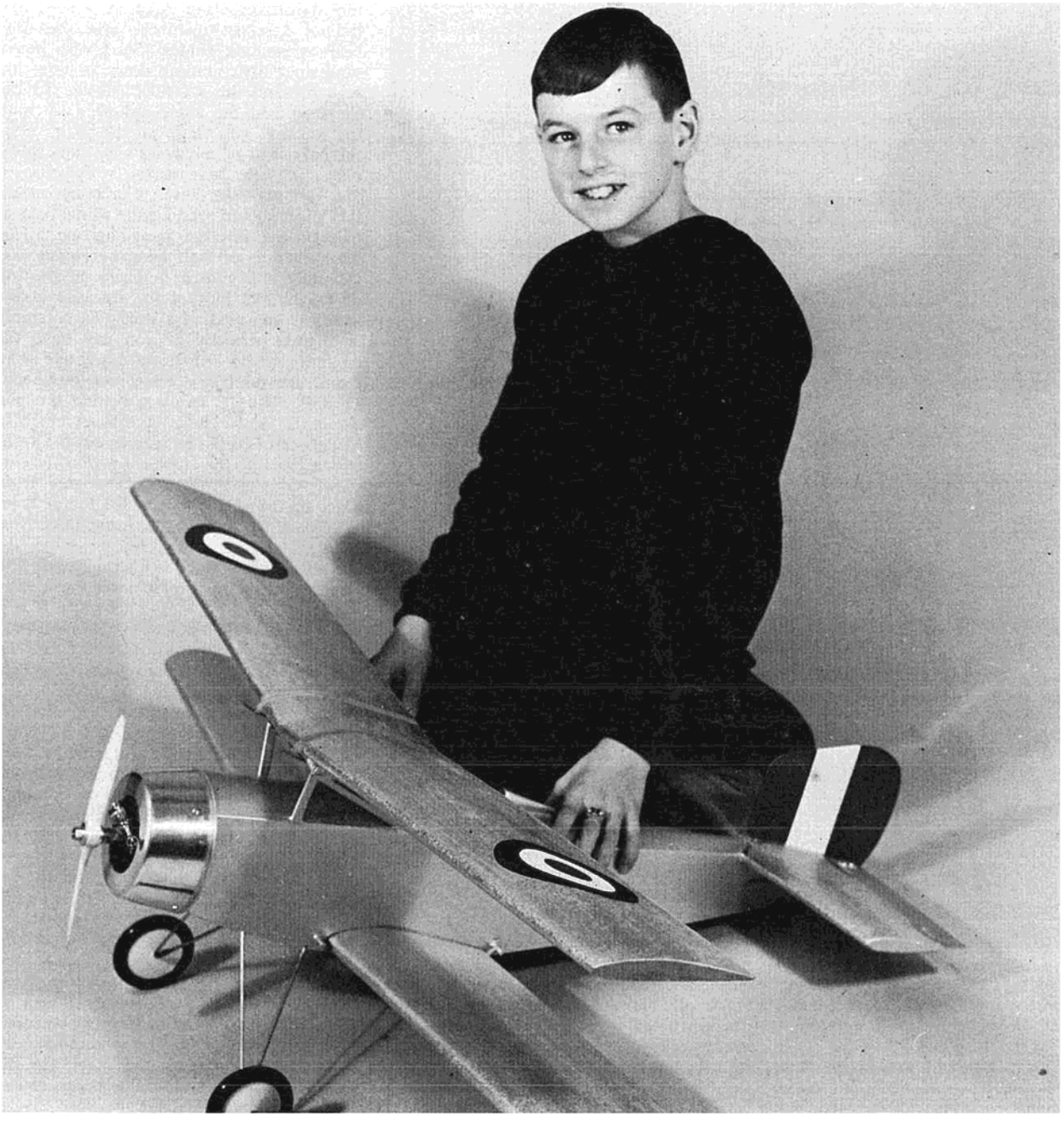
This method will save 3-4 oz. of weight, but is not quite the glass smooth finish you will get with the other method. If you have already used the Hobby Poxy Easy-Does-It method and are familiar with scraping the final glue coat with a razor blade **do not** scrape the blotter covered parts with a blade because this will cause a ripple to develop. Sand only and the result will be very rewarding. The wood parts can be scraped in the manner indicated by Pettit in the EZ-Duz-It brochure, however I have found that a combination scrape and sand works the best on balsa wood.

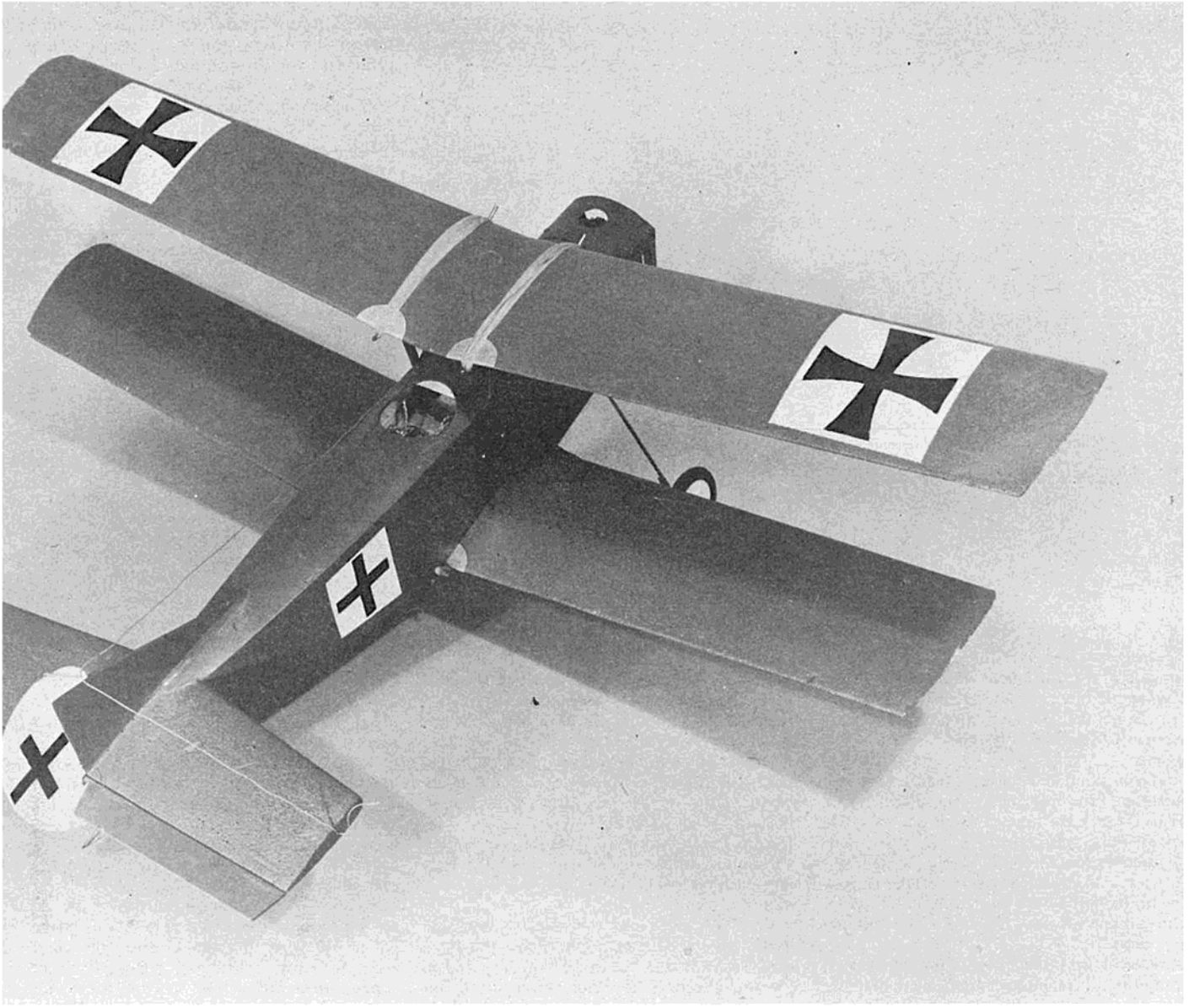
The wing is constructed using the standard styrofoam and balsa sheet method. Just a few words about the one or two unusual aspects of the wing is in order. First, notice that this is a three piece wing. The flat center section is required so the wing will fit the flat 1/32" ply wing saddle. Join all three sections together the same way the two sections of a standard foam wing are joined. If you do not have a hot wire cutter most of the foam wing manufacturers will cut special wings on request if you send them a drawing of the wing outline and the full size cutting templates shown the plan. Be sure to inlay a sheet of 1/16" ply on top of the center section of the wing 1" from the trailing edge before sheeting the wing with balsa. This plate is part of the bolt hold-down assembly for the wing. Each of the wing fences are built from 1/8" balsa according to the outlines shown on the plan. 1/32" balsa is used to cap each side of each wing fence. The nylon tube laid inside of them is a guide

*(Continued on Page 29)*

By Bob Kendall

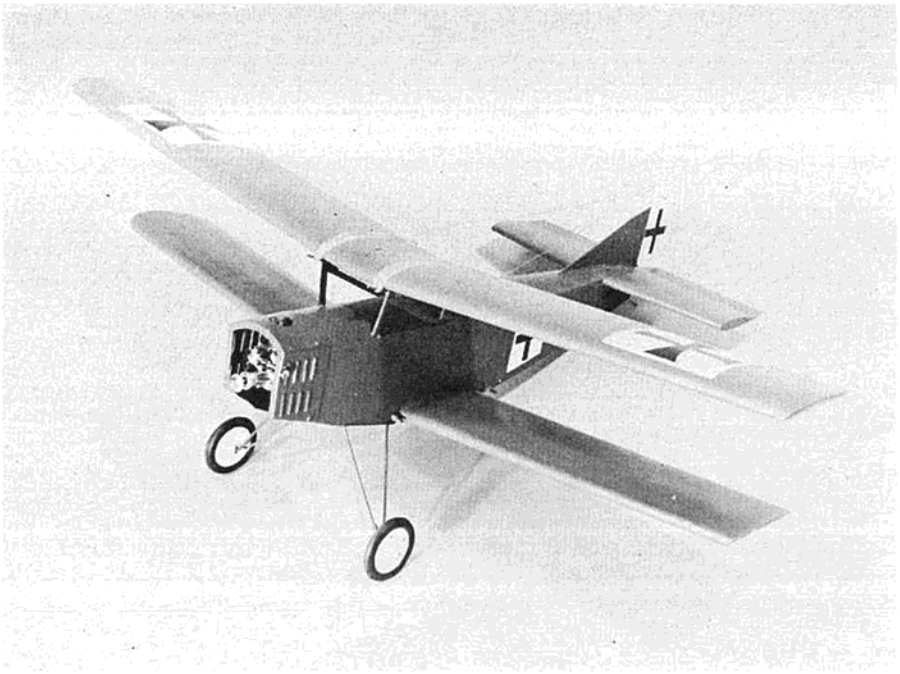
# *easy*





# BIPLANES

*Easy-to-build and easy-to-fly, these not-so-scale WW I biplanes are designed for .15 to .19 engines and Midwest molded foam wings and stabs. Suitable for Galloping Ghost or the new small proportional systems. A Sopwith, anyone?*



AS the first light of dawn breaks over the Eastern horizon there is the sharp crackle of a Le Rhone as man and machine rise up to meet the day halfway, on their way to another perilous mission into enemy terirtory. The Dawn Patrol is on the prowl again.

If you, as I, have always had a touch of nostalgia for biplanes, especially World War I biplanes, now is the time to relive again those glorious days of yesteryear. (I think I may have my stories mixed up.) Anyway, Midwest has now made it easy for all biplane lovers by making foam wings and taking all the "fun" out of building two wings!

When I first saw these wings I decided to design a biplane for my 15 year old son, Tim. I decided to use the foam wings, to take the work out of building, and the Min-X Rand combination to put reliability in Galloping Ghost. I thought this also would be a good opportunity to make a plane as simple and easy to build as possible for the kids. One they could be proud to take to the field. Don't get me wrong, this is **not** just a plane for beginners. By putting a "15" in it the kids can handle it and also do stunts instead of just going in circles. The more experienced R/C'er can put a "19," Galloping Ghost, reeds, or proportional in it and have a ball.

Since this is a plane that can be easily built by beginners, I will give detailed building instructions. So, if you are ready, "Contact!"

**Construction**

Start by cutting out all parts, fuselage sides, doublers, formers, servo rails, cabane struts, fin, rudder and elevators. Be sure to cut the right fuselage side 3/16" shorter at the nose than the left side. Contact cement the doublers to fuselage sides starting at the nose and working back. Be sure to start 1/4" from the nose with the first doubler in order to leave space for the 1/4" firewall. Use white glue for the servo rails. Don't forget to make right and left sides and taper the doublers where cabane struts fasten to sides. Use white glue or cement for cabane struts. Glue 1/8" longerons and braces to sides.

Install formers B, C, and D. The formers fit against the offsets of doublers to make it easier to line up. Be sure the fuselage is square. When dry, pull the tail together and glue. Put in the wedge piece with the tail skid installed. Now glue firewall in place. Glue on the rear top formers and bottom 1/8" cross braces. Glue the 1/4" ply landing gear block to bottom. Bolt the aluminum motor mounts to firewall. Use nuts behind mounting plates to lock the mounting bolts in place.

Glue 1/4" balsa block in the bottom, between ply landing gear plate and the firewall. Take two pieces of 3/32" medium balsa for top sheeting, run hot water on them for a few minutes and wrap around a quart fruit jar, hold in place with strips of rag. Let these dry overnight and they will retain their curvature. While they are drying, sheet the rear bottom of fuselage with 3/32" medium or hard balsa, running the grain lengthwise. Mark and center punch the motor mounts for the motor of your choice. I used an "Enya 15 T. V." on one and a "Veco 19" on another. Drill the motor mounts with a #43 drill and tap with 4-40 tap. Use a little oil for easier tapping.

Sand the flashing from foam stab with fine sandpaper. Make elevators by gluing length of 1/8" dowel in the insert in front center edge. Keep the elevators straight and flat while gluing. Drill holes for the thread hinges, using a #58 drill. Holes in the foam should be 3/8" in, and 3/16" apart, and 3/16" in and 3/16" apart on the balsa elevators. Sew hinges with button and carpet thread, using figure 8 hinge. Coat the thread with white glue on top and bottom. Try not to get any glue between the elevator and stab. Don't pull too hard on the thread when sewing, or you will cut through the foam. Glue the stab and elevator assembly to fuselage using white glue. Be sure the stab is centered and straight horizontally to the fuselage.

Insert a 9 inch length of Midwest nylon tubing through the firewall and notch former B to recess tubing in place. Epoxy cement to the firewall and former B.

Using one of the precurved pieces of 3/32" balsa, notch one side 5/16" to fit around cabane struts. Slip around cabane struts, making sure it overlaps the fuselage side. Now mark and cut notches for the other side. Run sheeting from the front to halfway of former D. The front half of sheeting may now be glued in place.

Use the second piece of curved sheeting for the rear. Hold in place and mark from underside. Cut a little over size. Mark where the straight line contacts the foam stab. This will be a cut and fit operation. The underside of sheeting will have to be tapered to fit the foam stab. When you have it cut to fit, glue rear in place. Use white glue where the decking contacts foam stab. White glue may be used for the entire sheeting if you wish. Don't worry about the sides overlapping, they can be trimmed and sanded flush later.

The cockpit may now be cut out. Mark a spot 2 inches forward of the sheeting joint and in the center of the fuselage. Use a compass and make a 3 inch circle. Cut along this mark for the cockpit.

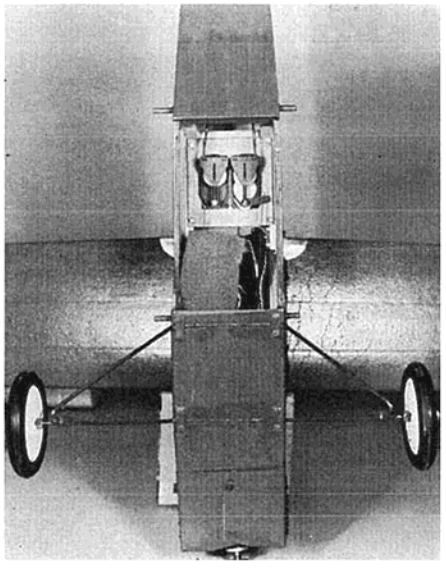
Now round off the edges of the cabane struts, using a 2-0 grit paper. Don't round off the top edges as the wire brace will fasten to them to form wing seat.

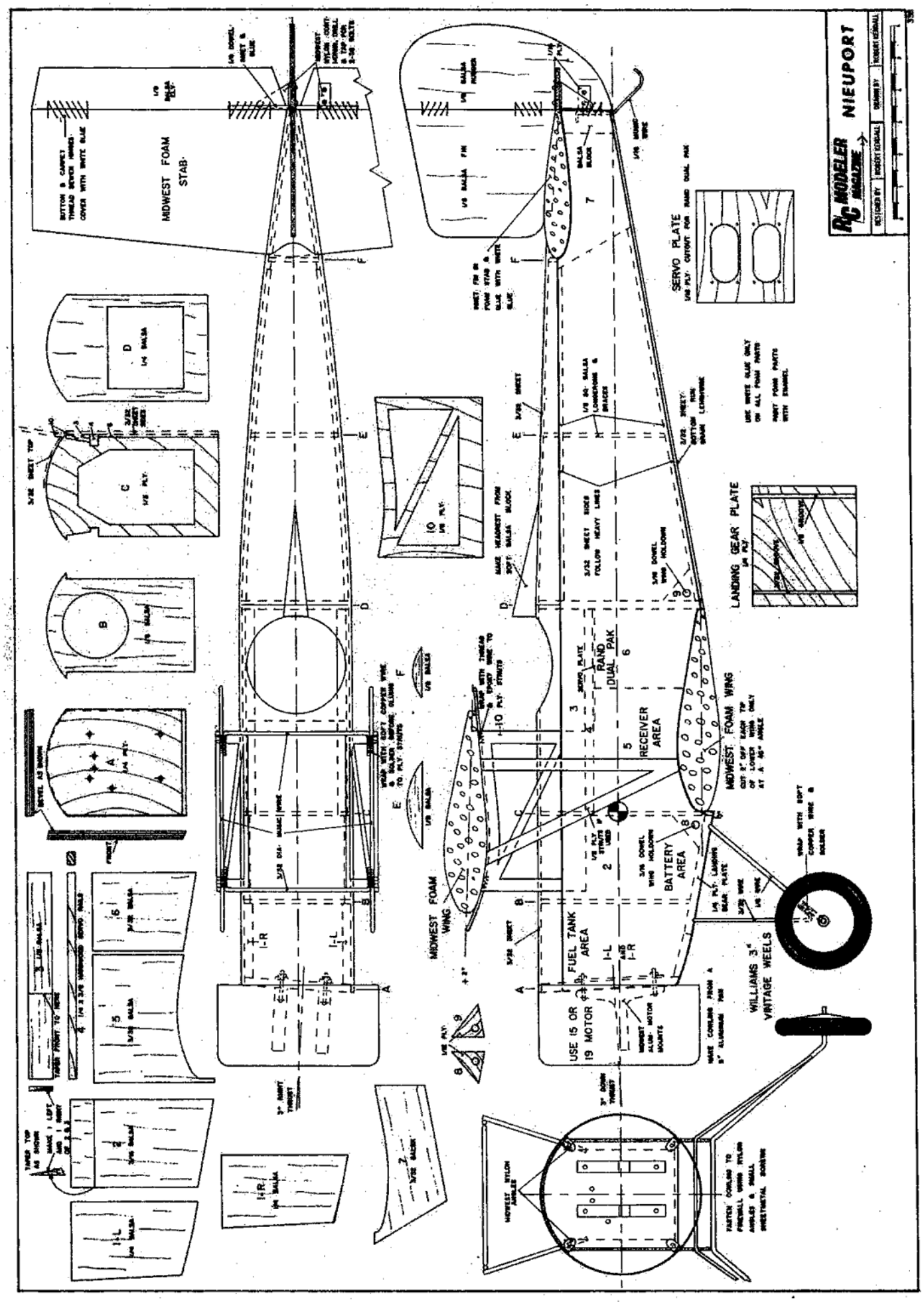
Round off front and top of fin. Drill #58 holes 3/16" in and 3/16" apart for rudder hinges. Sew the hinges the same as on the elevator. Mark a center line on the top of the foam stab, and with a razor blade, cut a 1/8" slot in the top of the stab for the tongue on the bottom of the fin. Glue the fin to the foam stab, using white glue. When dry, sew the bottom of the rudder onto the rear of the fuselage.

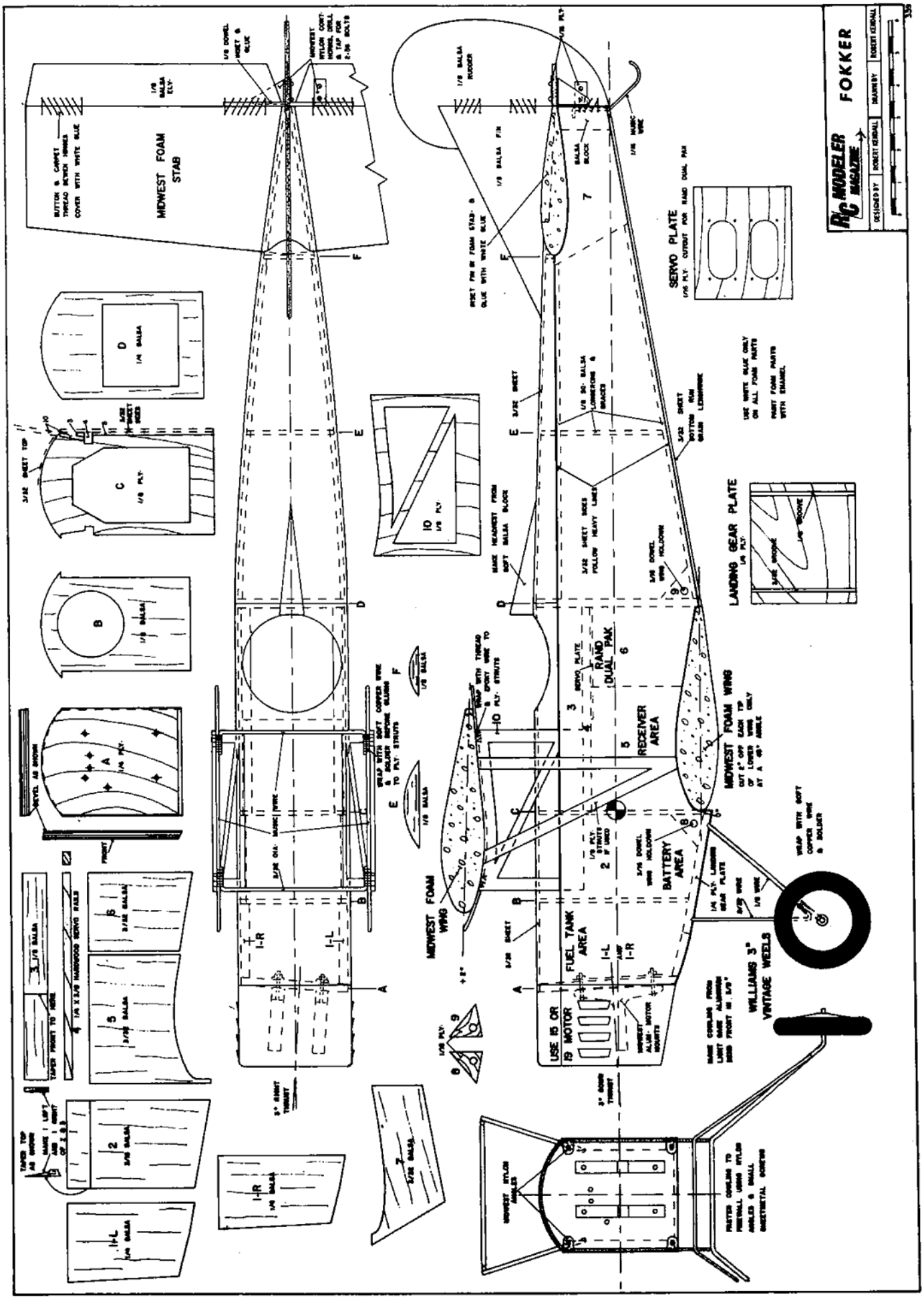
Bend 3/32" music wire to the shape of the bottom of the wing. Make this piece 3/4" music wire to form cross braces and wrap to wing hold-down wire with soft copper wire. Solder 1 1/4" in from each end.

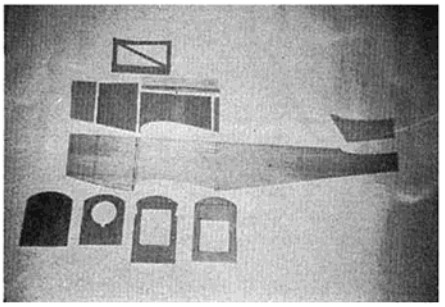
Drill #58 holes 1/4" down from the top at each end of the cabane struts. Place the wire holddown between cabane struts, and sew through holes to the cabane struts

Rand Dual Pak installation in Fokker. Viewed from lower wing access area.

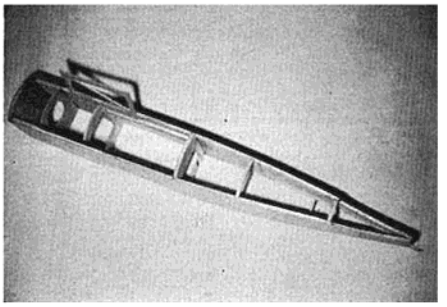



NIEUPORT
RC MODELER MAGAZINE
MIDWEST FOAM STAB.
MIDWEST FOAM WING
RECEIVER AREA
BATTERY AREA
FUEL TANK AREA
USE 15 OR 19 MOTOR
RAND DUAL PAK
SERVO PLATE
LANDING GEAR PLATE
WILLIAMS 3" VINTAGE WHEELS

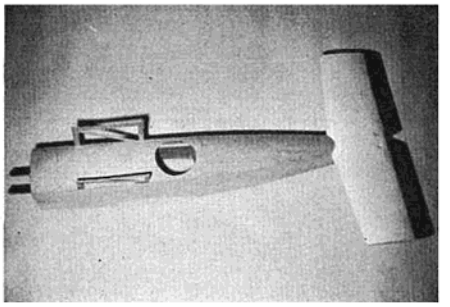

FOKKER
R/C MODELER MAGAZINE
DESIGNED BY
ROBERT KENDALL
DRAWN BY
ROBERT KENDALL
MIDWEST FOAM STAB
1/8 BALSA ELV.
1/8 DOWEL INSET & GLUE
MIDWEST NYLON CONT. WINDING PULL & TAP FOR 2-56 BOLTS
BUTTON & CARPET THREAD BENCH HINGES COVER WITH WHITE GLUE
1/8 BALSA RUDDER
1/8 BALSA FIN
INSET FIN IN FOAM STAB & GLUE WITH WHITE GLUE
BALSA BLOCK
1/16 MUSIC WIRE
SERVO PLATE
1/16 PLY. CUTOUT FOR RAND DUAL PAK
USE WHITE GLUE ONLY ON ALL FOAM PARTS
PAINT FOAM PARTS WITH ENAMEL
1/8 SQ. BALSA LONGERONS & BRACES
3/32 SHEET
3/32 SHEET BOTTOM FOR MAIN LONGERONS
3/32 SHEET SIDES FOLLOW HEAVY LINES
MAKE HEADREST FROM SOFT BALSA BLOCK
1/8 DOWEL WING HOLDOWN
LANDING GEAR PLATE
1/4 PLY.
3/32 GROOVE
1/4" GROOVE
RAND DUAL PAK
SERVO PLATE
RECEIVER AREA
MIDWEST FOAM WING
CUT 2" OFF EACH TIP OF LOWER WING ONLY AT A 45° ANGLE
WRAP WITH SOFT COPPER WIRE & SOLDER BEFORE GLUING TO PLY. STRUTS
WRAP WITH THREAD & EPOXY WIRE TO PLY. STRUTS
1/8 PLY. STRUTS 2 IF USED
BATTERY AREA
FUEL TANK AREA
USE 15 OR 19 MOTOR
MIDWEST ALUM. MOTOR MOUNTS
1/16 PLY. LANDING GEAR PLATE
1/8 WIRE
WILLIAMS 3" VINTAGE WHEELS
WRAP WITH SOFT COPPER WIRE & SOLDER
MIDWEST NYLON ANGLES
FILETED CONLINE TO FIREWALL USING NYLON ANGLES & SMALL MACHINE SCREWS
BUTTON & CARPET THREAD BENCH HINGES COVER WITH WHITE GLUE
1/8 BALSA
1/8 X 3/8 HARDWOOD SERVO RAILS
TAPER FRONT TO HERE
TAPER TOP AS SHOWN
BEVEL AS SHOWN
3/32 SHEET TOP
3/32 SHEET SIDES
1/8 PLY.
3/32 BALSA
1/4 BALSA
1/4 PLY.
1/8 BALSA
1/8 PLY.
3/32 OIL WIRE
MUSIC WIRE
FRONT
5° RIGHT THRUST
2° DOWN THRUST
+8°



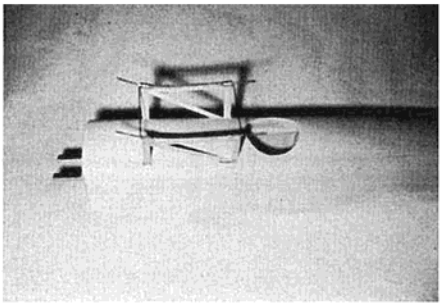
All fuselage parts cut out.



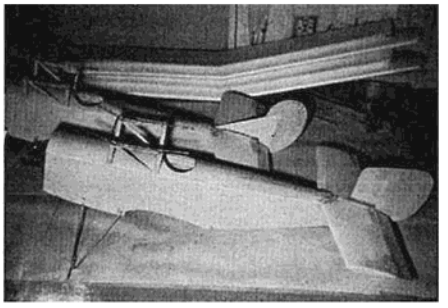
Sides joined and all formers in place.



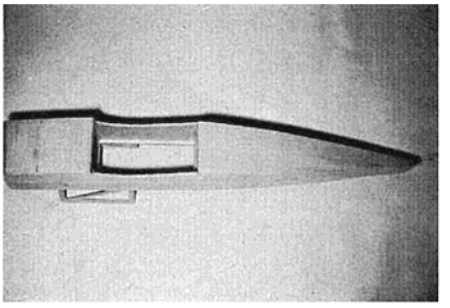
Top sheeting and stab and elevator in place.



Wing holddowns and wire braces fastened to cabane.



Rear bottom sheeting, nose and L.G. block added.



Nieuport and Fokker nearing completion.

themselves. When all four corners are sewn, epoxy along the wire and cabane struts. Bend 1/8" main landing and 3/32" front wire gear. Place in slots in ply landing gear block and wrap with soft copper wire and solder where they come together. Mark holes for Midwest gear straps. Drill the pilot holes and fasten gear to plywood plate, using 4 straps and wood screws. Keep the straps as close to the bends in landing gear wire as possible to keep landing gear from slipping sideways.

Use a 1 5/8" diameter nylon bottle such as is found in hair coloring sets. Cut off 1/2" of the neck, and using a #1 rubber cork, drill 2 #38 holes 3/8" apart. Insert one straight piece of 1/8" diameter copper tubing, 1 1/2" long. Use another piece of tubing 2 1/2" long. Use yet another piece of tubing 2 1/2" long and bend a curve on one end. Push this through the other hole in the rubber cork. Leave about 5/8" of tubing extending out of the front of the cork. To the straight tubing, fasten a length of fuel tubing long enough to extend to the rear. Put a 3/4" length of copper tubing into the rear of this piece of fuel line to act as a weight. Put the cork into the neck of the bottle and push in as far as it will go. You now have a fuel tank. Install in place in your plane with the tubing extending through the firewall. It is also a good idea to put a piece of Midwest Fuseal around tank where it comes in contact with former B.

Dope the fuselage, rudder, and fin with one coat of clear dope. When dry, sand lightly with 400 sandpaper. Mix two parts of clear dope and one part talcum powder and cover the balsa parts again with a heavy coat. Sand again and you are ready for the color coats. Two coats of color dope should be enough. When doping, be careful not to get dope on the foam stab as the dope will melt it.

Cut off two inches of each tip of lower wing at a 45 degree angle. Now sand flashing off of wings. Paint the wings and stab with enamel, such as Spray Ply.

Now you can put on the trim. The Nieuport was painted all silver with fin and rudder stripped red, white and blue. Red, white and blue roundels were painted on the wings. The Fokker is painted all red with black crosses on a white field.

The Nieuport cowling is made from a 5 inch aluminum sauce pan. Grind off the top ring and handle, and cut out the bottom by using an X-Acto knife, cutting around the bottom recess.

You need not cut all the way through, just score heavily, then by drilling a hole and working back and forth with a pair of long nose pliers, it will break on the scored line.

The Fokker cowling is made from a scrap piece of aluminum siding. Cut a strip the width of cowling plus 3/8" extra and long enough to go around the nose of the fuselage. Bend to nose shape and notch 3/8" deep at corners and about every 3/8" at curved section. Now bend the front 3/8" at a right angle all around. This will stiffen the cowling.

The cowling is fastened to the firewall by using Midwest nylon angles. Put one nylon angle at each corner and flush with the outside edge of fuselage. Fasten to the firewall with wood or sheet metal screws. Place the cowling on the plane and line up so it is square with the fuselage, then mark the position of the nylon angles and drill the necessary holes in the cowling for the screws. Drill a small hole through the nylon angle and fasten the cowling by using sheet metal screws into the nylon angles.

Install a Rand Pak, either single or double, to servo board with small bolts. Mark holes for fastening servo board to servo rails. Put a length of Fuseal between the holes, and using wood screws, fasten to servo rails.

Put Midwest nylon control horns on the rudder and elevator by putting a piece of 1/16" ply on the opposite side and running 9/32" bolts through ply and balsa. Drill and tap the nylon control horns, then screw bolts into the nylon horns.

Make the pushrods from 1/4" x 1/4" hard balsa and put a length of bicycle spoke on one end with a Midwest nylon clevis. Fasten a piece of 1/16" music wire to the other end. Bend at right angle at the correct length to line up with the hole in the Rand actuator.

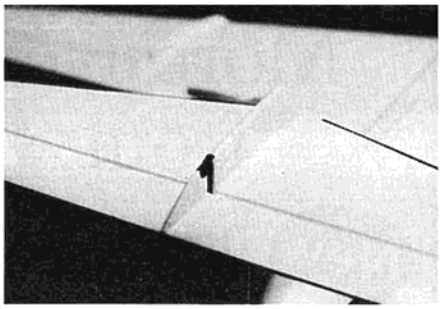
The motor control rod is put through a nylon tube and bent to connect the throttle to the Rand motor control arm. Fasten this to the Rand actuator the same way as the push rods are fastened.

Wrap the batteries in foam rubber and place in position in the fuselage. Batteries may be moved back and forth to balance plane. Wrap receiver in foam and place in front of the Rand Pak. Drill a small hole in the top of the fuselage to run the antenna through. Make sure the antenna is not close to the motor push rod or any other wires.

If you want to make your plane more realistic, add a windscreen, machine gun, wing struts or any thing else you may have in mind.

To test fly, I would recommend hand launching for the first couple of flights. Although they track very well, there might be a chance of ground looping till they are trimmed out. All of the ones I built flew right off the board with very little trimming. With the "19" you can almost fly the pattern. They will loop and roll from level flight. With the "15" they will still stunt but you may have to dive a little

*(Continued on Page 29)*



Close-up of the elevator horn and stab area.



## EASY BIPLANES

*(Continued from Page 28)*

before looping. Both configurations are very stable with the "15" being a little slower for the kids.

The beauty of this design is that by just changing the rudder, cowling and paint job, you can make a Nieuport, Fokker, S. E. 5, Spad or any other favorite WWI design. True, they may not be absolute scale but at 20 feet distance, they look like the real thing.

Well, now that you have a fighter, get your friends to build one too, and then fly combat. Who knows, maybe some one will make a model machine gun that works and then you can really shoot him down!

Look out Snoopy; here comes the Red Baron once again!

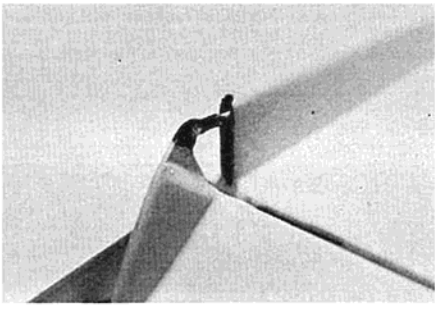
## B.J.

*(Continued from Page 22)*

for the 1/16" piano wire push rod. The aileron horns and the elevator horns are made from 1/16" phenolic material sheeted on each side by 1/16" then sanded to a standard trailing edge airfoil shape and epoxied in place. The 1/16" piano wire push rods are connected to the phenolic horns by a small brass connector, made from 1/8" brass tubing cut, flattened, drilled and soldered to the 1/16" wire. A small pin made from a paper clip is put in place and soldered on both sides of the brass tube. File the ends of the pin down after soldering in place, so it will slide easily into and out of the slot in the aft end of the wing fence as the aileron moves up and down. If you are worried about the strength of this arrangement let me say it has been used on several different airplanes without a single failure ever during the hardest landing and even a **crash** (even Volkswagen admits they aren't perfect). The connectors used on the end of the nyrods for the elevator, rudder and engine are 2-56 screws and Kwik-Links. The landing gear is placed 7" from the trailing edge of the base cord and affixed to the wing with slotted maple bearers and metal straps and screws. These can be obtained from Top Flite or you can fabricate them very easily in your shop. The nose gear installation is a bit out of the ordinary but is very strong if constructed as indicated on the plan. Be careful not to take the temper out of the 5/32" piano wire when you solder the brass sleeve over it. The scissor is made from paper clip wire and 1/16" brass tubing.

The front of the model is large enough to accept most of the proportional equipment available today. I designed it around my Logictrol II and while this equipment will fit, smaller gear like the new Bonner 4RS would be much more easily handled by the available volume in the cabin area. If the lighter equipment is used, carve the wood nose block out hollow as indicated on the fuselage nose view and pour in enough lead shot and epoxy to balance the model between 35-40% back from the leading edge of the base cord of the wing. Some additional weight and needed strength can be achieved by fiberglassing the nose section from "B" forward. If additional weight is needed, it can be added under the receiver floor. A little planning ahead here can eliminate the necessity to carve a hole in the floor to imbed the lead in the styrofoam.

The last bit of construction is the fuselage fairing beneath the wing, filling out the fuselage between "B" and "C." Cut two 3/32" ply formers with the wing in place on the wing saddle using "B" and "C" as drawing guides. Make them 1/16" undersized to allow for the blotter to be added later. Glue these bulkheads to the front and back of the wing. Cut and fit a 1/8" balsa sanding template down the center of the underside of the wing between these two bulkheads. Cut two identical foam blocks to fit either side of this strip and the contour of the wing. Glue



Close-up of the aileron horn and push-rod coupling in the fully deflected position.

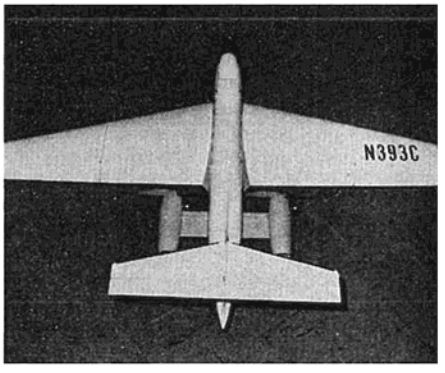
these in place and sand to shape. Put the blotter over the smoothed fairings and finish the same way as the main fuselage.

The final finish is two sprayed coats of white Hobby Poxy. Sand the first coat smooth using 280 Silicone Carbide sandpaper after it has been allowed to cure completely. Spray the final coat on as thinly as you can, being careful not to get an orange peel or pocked finish. The trim is Hobby Poxy Light Blue brushed on and Gloss Black for the fuselage stripe. The De-Ice strips and the anti-glare panel in front of windshield are brushed Hobby Poxy black, but mixed with Satin Finish Hardener rather than the standard hardener. The decals used on my model are from Finishing Touch AMA sheet although any suitable decals would work just as well. The windows are cut from Sig Black sheet decal. Patterns for these are not indicated, in order to allow you to tailor your "B. J." to suit your own tastes.

One last word. The engines used on my model are OS 19 R/C's. I feel these are adequate but if you desire more power the engine pods will have to be made larger and the pylon supporting the pods will have to be extended to allow for clearance for the props used on the larger engines. In any case, I would not recommend engines larger than .29 or .30. The Styros series used a single K. B. 45 or ST 46 and they would climb nearly out of sight at a 45 degree angle so you can see the performance is there with a relatively small power plant.

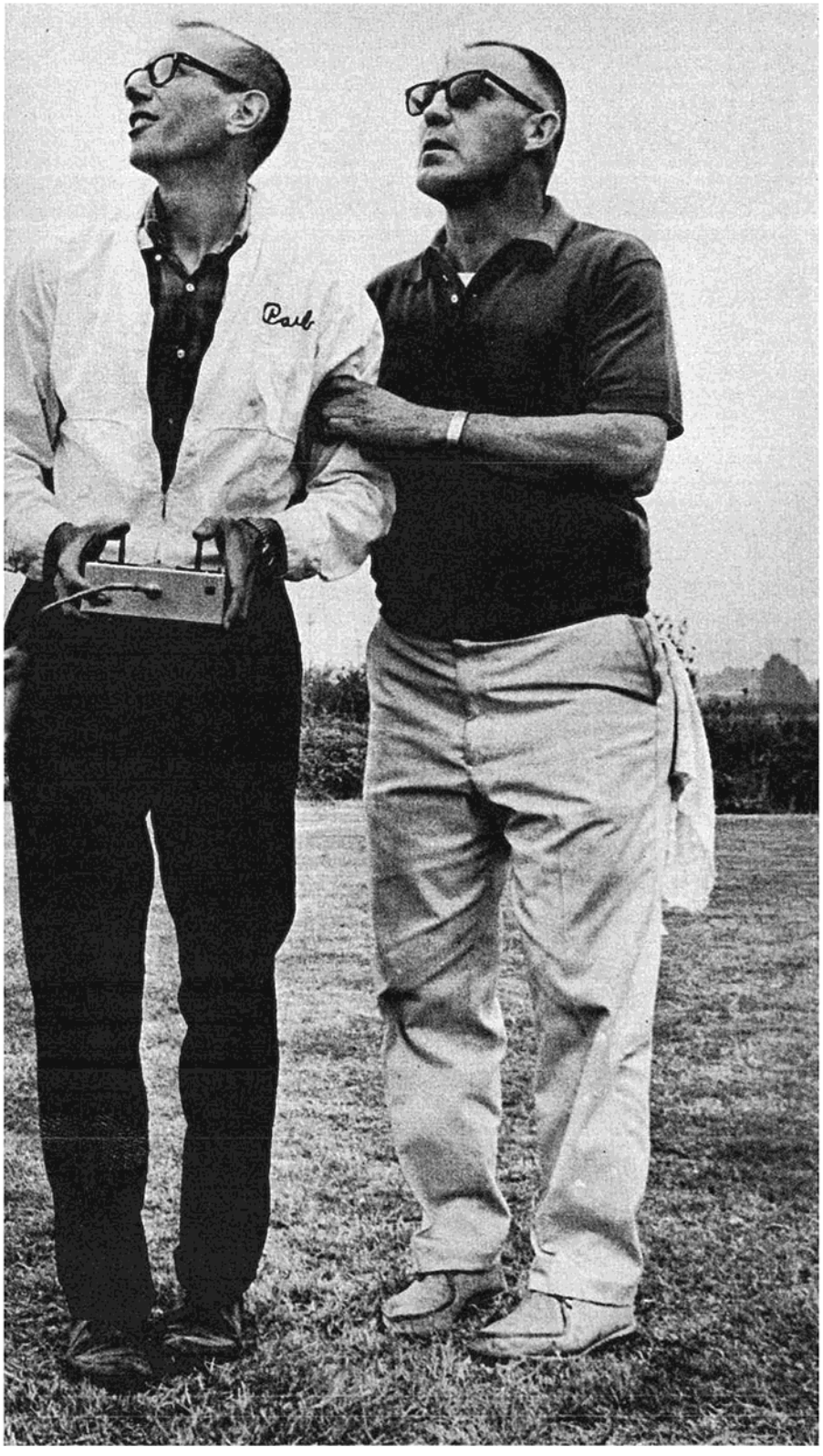
Be careful on the first several flights. Let the model roll longer than you normally do and bring it in for landing faster than usual until you feel it out well. Good Luck and many happy flying sessions with your "B. J."

The excellent closeup photos accompanying this article were taken by Major J. P. Pretlow.



# HOW TO BE A NOVICE

Text and Photos By John Ericksen



When in doubt, let an expert fly it. Expert here is Paul Good. Novice Roy Burke (right) still looks a bit shaken, but the plane survived.

I DON'T know Don Dewey well enough to call him "Fearless Leader," but when he recently suggested I write an article entitled, "From Novice to Expert," I had to admit the "Fearless" part had some merit.

Especially since I'm known to my flying buddies as "Old Pea Patch" — a title earned by hitting a pea field upwind from our field more times than anybody except "Splat Larson" . . . and I taught him to fly.

I'm now an "expert", however, and haven't hit the pea patch in a year. Neither has "Old Splat." We got kicked off the field a year ago when some over-zealous priests built a church there.

When I say "expert" I'm referring to the A. M. A. rule. It states that anyone winning a first, second or third in a sanctioned contest three times shall be classified an expert. This I've done. Won the Nats I ain't.

What I'd like to do here is give some advice on how to be a novice.

On the surface, becoming a novice requires only having an airplane, radio, FCC and AMA licenses and two or three bucks for entry fee. (Okay, you nitpickers . . . Get an engine and some fuel too.)

However, it isn't all that simple. If it was thousands of novice pilots would be competing. They aren't. Why?

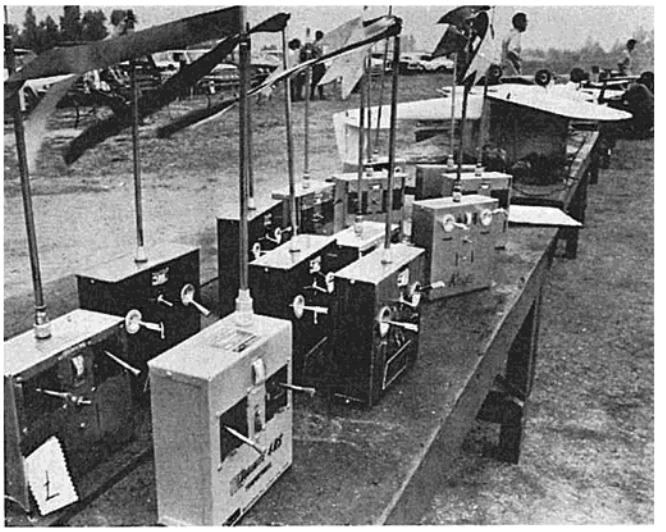
There as many reasons given for not competing as there are Sunday flyers, but the one never given is probably most often the real one. It's just plain old stark naked fear.

Now before you all start writing nasty letters, let me explain. Nobody blames you for being scared stiff of a contest. I was, and still am. Every "Ace" contest flyer I've ever talked to is. The stark fear eventually becomes a quiet exhilaration, but it's still there.

Come on, admit it, if you sport flyers didn't get that knot in the pit of your stomach when your airplane lifts off and away, you'd quit.

The excitement and appeal of this sport is based largely on just that fear that keeps so many away from the contest field. All a contest is actually going to do to you is improve your flying about 200% and your enjoyment of the sport will soar because your flying has improved.

Sport flying is great, don't get me wrong. I've done much more of it than any other type. It has an appeal all its own. I love single-channel and galloping ghost — partly



Left: Large variety of proportional manufacturers are usually represented at transmitter "impound" area. This is a good place to see "what the contest boys" are flying in your area. Above: Keeping transmitter facing same way as airplane is good way to keep orientation — also keeps pilot from pointing antenna at airplane.

because I can understand how the damn things work. (I think proportional is done with mirrors.) As I look back at all the fun airplanes I've had, a little Roaring 20 on escapement is remembered as the most fun of all.

But, if you're going to progress with your flying, some contest experience will be of more help than any other single thing you can do. Besides, how else are you going to justify spending several hundred bucks on a proportional?

And spend it you must. Proportional isn't required in the rules, but if you expect to compete in anything but scale, it's a necessity, and unless the rules are changed, it's going to stay that way.

Okay, let's assume you've swallowed the bait and decided the flat-bottom wing is no longer for you. You're going to turn competitor.

From here on I'll get as specific as possible and you guys who've seen me fly just sit back and read something else. If you do continue, "Splat" et al, just do as I say, not as I do.

First, you'll need a proportional radio. Try selling some of your less sophisticated equipment to finance it. A used escapement job won't bring much, but it'll help. I don't know of any really bad proportionals on the market, so I won't make any recommendations as to brand except to say that if you ask around or go to a contest, you'll get plenty of advice. Get a digital system, however.

Also, get a two stick, and although a lot of people will disagree, I'd recommend that you get the throttle on the right stick (unless you're left handed). A right hand throttle arrangement (throttle and ailerons on right stick and elevator and rudder on left) is harder to learn on, but pays off (I think) in contest flying. It's easier to separate aileron and elevator movements on separate sticks.

This is still a matter of controversy among flyers, however, so if you've learned one way, by all means don't change now.

Now, for a first competition airplane. I had great success (well, some) in novice with a Cherokee. It's slow (by comparison) and will get through all the maneuvers. It's no Kwik-Fli, but until you learn to fly the airplane instead of the box (more about that later), you don't want a Kwik-Fli or any of the other hot-dogs being flown by the reigning contest wheels. A Senior Falcon is also a good novice type competitor.

If you can already fly either of these airplanes well then go for one of the plastic jobs or an Ugly Stick (which, by the way, is a lot hotter than you'd think) or any number of other "full stunt" ships. The good old Taurus fits well here.

In fact, one of the best pattern ships I've seen was an old Taurus that "Splat" had with a Kwik-Fli wing. I dumped it for him, however, before he had a chance to enter a contest and prove it. (By the way, "Old Splat" has progressed so much recently, we now call him "ZZZut". . . . you know, the sound a semi-controlled crash makes when you can still repair some of the prices.)

The engine must be a 60. A smaller one will do, but you're going to want a 60 (or 61) sooner than you think, so get one and keep it throttled back until you can handle it. If you're a rank beginner with a proportional radio, I'd still recommend a 60, but for gawd sakes keep it throttle down! Run it four-cycle until you feel comfortable. The only exception to the 60, but for gawd sakes keep it throttled ships that would be "illegal" with the larger mill. I'm not convinced the small pattern ship is for the novice, however.

Now that we've got a digital radio, a big "slow" pattern ship with a 60 in front and a $600 hole in our budget we're ready to hit the contest trail.

Not quite.

A little practice is in order.

Even before we start serious practice a few building tips might be helpful.

It probably goes without saying that a warped wing, stab or out-of-line fuse won't do for contest work. A competition airplane must, repeat, absolutely must, be aerodynamically true. By that I don't mean one that will just fly straight "hands off." We're talking now about one that will also fly straight inverted, track through a loop . . . especially an outside one, roll without excessive yaw (side motion) and in general go through the complete pattern with as

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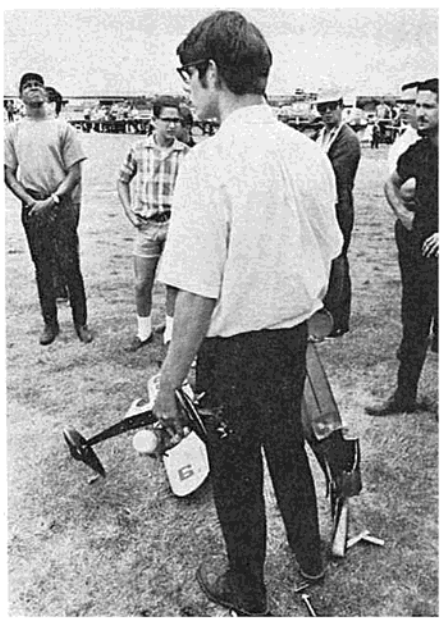

Left: It happens to everybody sooner or later, so have a spare "in the works." A too long delay between practice sessions can mean slow (or no) progress. Right: Pinch off fuel line between flights to keep from siphoning fuel into engine.

After flying everything from pulse Eindecker and escapement Schoolboy, author finally made it — a third in "Expert." It took two years and a proportional.

little corrective control as possible.

All the planes I've mentioned and a slug of others will do this, but not unless they are built and trimmed properly.

You've all read, I'm sure, how to build a straight wing, fuse, etc., so I won't go into it here except to urge that it be done.

What you haven't read before, however, is how to properly finish an airplane for preliminary contest work. I've found that dope, acrylic and epoxy finishes all fly about the same, so use the method you like best.

However, if this is your first competition airplane, the final coat of dope, epoxy or whatever, should be mixed with equal parts of Mrs. Wright's Zesty French Salad Dressing. Eastern flyers can substitute a similar product manufactured by Best Foods, Inc. (Mrs. Wright's dressing is available only on the West Coast).

Sound silly? Of course it is, but there are two good reasons I'm suggesting it.

First, I hope to set some sort of record around this magazine for Payola. Second, the salad dressing will screw up the finish to such an extent that you'll hate the airplane. This is important.

I've seen a good many novice type flyers trying to fly beautifully finished airplanes and it just doesn't work. Some of these guys (I've been one myself) get an absolute love affair going with their lovely creations and spend so much time fondling, admiring, fretting and fussing with them they seldom mess 'em up with nasty old fuel and when they do fly it's so high and carefully they never seem to progress in ability.

On this airplane let's spend that extra building time on things like straight wings, smooth control linkages, fuel location (middle of tank level with or just slightly below spray bar) and in general let's get a good flying airplane first and worry about looks later.

Now for practice.

There are several plateaus in R/C flying and the first one seems to be learning right from left. If you've done some, but not a lot of flying you'll know what I'm talking about. It's the ability to make the airplane go right (or left) when you want it to. If you've never flown an R/C airplane you'll have to take our word for it, but I guarantee that every "student" pilot has made a left turn when he thought it was right and vice versa.

Problem is that when the airplane is going away from you right control gives right, but when it's coming toward you, right gives left. If you are still hung up on the right is left business, try turning yourself the same way the airplane is flying at all times. This means you'll be looking over your shoulder at landings, but it'll help. This won't do much good in a loop or roll, however, (you'll end up falling on your . . . . .er, transmitter) so you must eventually put yourself (mentally, of course in the cockpit and get yourself going the same as the airplane at all times and in all maneuvers.

I've resorted to all sorts of mental gymnastics to help solve the old right is left bug-a-boo. One exercise you might try is when driving your car, mentally put yourself behind the wheel of an oncoming car. Imagine which way to turn the other car to go right, left. Try it with cross traffic also.

When at the flying field mentally fly all the other airplanes, and whenever a big one (those expensive jobs with people inside) goes by give it a mental figure eight. If you're an R/C nut you're going to watch all the airplanes that fly over anyhow, so put the time to some use.

During this period in your development, you're also going to have a problem with complete disorientation from time to time. This is when you don't know whether that crazy airplane is going away from or coming at you or whether it's upside-down or right-side up. Best thing to do when this happens — and it damn sure will — is to hold everything for a second.

Don't panic. A moment's hesitation can be disastrous in an 80 M. P. H. missile, but it's not nearly as dangerous as giving a panic control that in all probability will just aggravate the situation. After a split second's pause you'll probably be able to tell what's going on. If not, then give it a deliberate control, (up elevator is probably best) and see what happens. At least now you know what you've done.

If the plane goes up, you're back in business. If it goes down, you at least know you are upside-down and then you can pull even more up and (if altitude allows) you'll end up right-side-up going the opposite direction.

Biggest point here is to remain as calm as possible, and don't give up. Too often a new pilot will get confused and literally say, "to hell with it," and let it crash. Stay with the beast until the bitter end. More often than not you can save it if you just keep your cool and don't give up.

Keeping your cool is tough in this kind of a situation, I admit, but if you've used salad dressing for a finish, it'll be a little bit easier.

Many of you, I'm sure, have seen a "just fair" flyer do an almost outstanding job of flying occasionally with some old wreck he doesn't give a damn about. One of the reasons, I'm sure, is that his lack of love for the airplane makes him a little less tense resulting in a calmer, smoother performance.

The second plateau is learning to fly the airplane instead of the box. By this I mean the position of the stick on the transmitter becomes of little or no importance to you. You've reached the point in your flying where the airplane receives your complete concentration and the box in your hands becomes just an extension of your eyes and mind.

When you reach this point, you won't know for instance how much up elevator you give to flair out a landing, anymore than you know how much you turn the wheel of your car to correctly round a corner. You just give it the correct amount without thinking about the mechanics of it.

This plateau is reached only by doing a lot of flying. There are no shortcuts I know of except maybe flying a little lower than you'd like so you are forced to concentrate on the airplane and its relation (close relation) to the ground.

You've reached this plateau when you discover that you've stopped the constant fiddling with trim levers that seems to be a preoccupation of the new proportional flyer.

The new flyer will probably want to retrim his craft in the glide. It's probably easier to land with up trim at first, but eventually you won't use it, so at least try a few landings using your eyes to keep the nose up instead of relying on the up trim.

When you've reached plateau number two and mastered it (with occasional relapses, of course, on the first or second flight of the day) you're ready to refinish the salad oil finished airplane (if it's still around which is doubtful) and start serious pattern practice.

By serious practice, I mean just that. Sport flyers (if they've been at it long enough) have probably reached the second plateau and can put on a hell of a show with some pretty fancy flying, but they don't win contests. Usually they don't enter, but if they do they're often outpointed by several brand new, but serious, flyers.

This brings us to plateau number three — disciplined flying.

Discipline denote lack of carefree fun, and plateau three isn't much fun. That's why most flyers (me included) have a hell of a time with it. A pattern contest requires that airplanes be flown in an extremely disciplined manner. You don't do a Cuban eight whenever the spirit moves you and the airplane happens to be in the correct position for one.

In a contest you do the maneuver in its proper sequence and in a proper place. Believe me, it makes a difference. That's why they call a non-pattern contest a fun contest. In a fun contest (limbo, bomb drop, etc.) the entrants still compete, but in a much less disciplined way.

They're a lot more fun, but there are probably a lot more crashes. Disciplined flying may not be as much fun, but as a side benefit, you'll probably crash less.

So let's face it. Pattern flying isn't much fun. But, if you take this sport seriously, (you must or you wouldn't have just spent 600 bucks on it) you owe it to yourself to give it a try. A serious try.

Start by getting a friend to read off the pattern maneuvers as you fly. You don't have to memorize them, your friend can read them off to you at the contest and

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## HOW TO BE A NOVICE

*(Continued from Page 32)*

steady your nerves (if possible) at the same time. Practice as though you were flying in front of judges and leave the immelman take-offs and split-S landings for another day.

Run through the whole pattern and then go back and work on individual maneuvers that were shakey. Spend a whole session on just one maneuver if necessary. It probably will be.

The pattern may be different this year, so I won't go through each maneuver, but a few hints for the would-be novice might be in order.

As the pattern now stands, you get just as many points for an easy maneuver as a tough one, so don't slop through any maneuver just because it's easy. Ten points for a perfect take-off counts just as much as ten points for a perfect tail-slide. You'll probably miss the tail-slide, but any of you are capable of ten-point take-offs, so practice the easy stuff too.

The four-point roll seems to be the one that bugs new flyers the most. My advice on this one is to cheat like mad.

On a four-point, the airplane is more or less approaching the judges from one side. At this angle, it's awfully hard to tell whether or not the nose is up when the airplane enters the maneuver. So get it up.

Don't be too obvious, but enter from a nose high attitude and your problems are half over. When you get inverted it's going to be tougher to sneak the nose back up (you're supposed to be right in front of the judges now), so if you need some extra down elevator, feed it in slowly. If your nose is up again on the inverted point, the third point will come almost automatically. If not, you're screwed anyhow, so get it up again when inverted if needed.

Secret here is to do the maneuver downwind with as much airspeed as possible. This helps hold altitude and zips it past the judges faster.

Proper four-points use top rudder on points one and three, but if this confuses you so much you blow the thing, try the cheating method — at least until you master the proper technique.

Rolls are also done downwind to smooth them out appearance wise. Again, get as much speed up as possible before beginning and watch for too much down elevator when inverted.

An airplane that requires a lot of down when inverted (especially a 0-0 thrust ship with symmetrical airfoil) is probably nose heavy. Fix it.

Wing-over or stall turn is a tough one to do well. Get the turn started before the plane craps out completely on top or you may end up with a tail-slide. A quick gun of the engine as you apply rudder can kick it over the top, but judges may downgrade you for it.

I talked to one Nats judge who gave Phil Kraft a lower wing-over score everytime he did it. At any rate, it's worth a try if it looks like the thing is going to fall out anyhow. A lower score here is better than none at all.

Outside loops should be done from a downwind heading. Positioning here is tough since you start the maneuver from the top and the bottom should be fairly close to the ground. Tendency is to start too high (just to be on the safe side) and end up way high on the entire maneuver.

Neat positioning trick I've seen lately is to begin outside-loop positioning with an upwind pass about 25 or 30 feet above the ground. Roll inverted in front of the judges and then make half an outside loop upwind. Announce the maneuver when you're on top of the outside loop, level out, throttle back and then begin.

This positions you at proper entry altitude automatically. Throttle back a second or two before starting the first outside loop in any case. Go to full throttle again as you nose over and hold full bore through the remainder of the three loops.

Rolling eight problems usually occur by not getting the bottom loop beneath the top one. It helps to begin this one heading into the wind. Throttle back on top of first loop. As you come around the first loop and begin your half-roll the low throttle coupled with upwind heading should slow you down enough to make the half-roll without moving too far forward. Throttle up again as you begin the second loop as you're going to need full steam to get back up into position for your second roll-out. If wind is strong, skip the low throttle.

Cuban eight requires a slight hesitation between the three-quarter loop and half-roll. This takes guts since you're heading toward the ground fast and you're inverted. It is necessary, however, if you want the roll in the center of the maneuver as it should be.

Tail slides require two things. Prayer and clean living. Do them down-wind, anyhow.

Spins and landings are grouped together in my book not because I've done several of them in one maneuver, but because they both require a lot of practice with your own particular airplane. Every airplane I've flown (and several have been on the same design) have special spin and landing characteristics that need to be learned and mastered before a contest.

It's never a good idea to switch airplanes just before a contest, but you'd be amazed at the number of flyers that do. Okay, "Zut," I'm guilty too. Remember, do as I say, not as I do.

Although engine starting isn't a maneuver, it can be one of the most important things you do in the pattern. If you don't get it started in time you get zero and if you're slow getting it going you must rush the remainder of the pattern to complete in time allowed.

Timing begins when you hook up the glow plug, so time lost here is time that must be made up in the air, not to mention the condition of a guy's nerves after he has spent two and one-half minutes cranking a balky engine.

Get to know your engine and be sure you can start it in any weather with one or two flips. My Enya kicks right off if I choke it four turns and then flip it 12 or 14 times before hooking up the plug.

Pinch off your fuel line between flights, also. A properly located fuel tank can siphon into the engine giving you a big flooded headache.

Okay, you've got it made. Only difference between you and Phil Kraft now is practice. And practice, and practice.

While you're doing all this practicing watch out for a few pitfalls, however.

One is always practicing maneuvers in the same direction. Many flyers I know can do beautiful rolls from right to left (for instance), but can't cut the mustard on a left to right roll. This happens when you practice a particular maneuver in a particular direction too often. Three rolls heading from left to right seems natural to them and extremely unnatural the other way around.

Wind conditions and field layout may be such at a given contest that the other-way-around is necessary and unless you can do 'em either way, you're in big trouble.

Also, learn to fly in a restricted area. Contest directors are tough about flying over the crowd or other areas and can cause real problems for a sport flyer used to roaming the sky at will.

Final bit of advice is to make yourself fly in all sorts of weather. Wind problems are mostly psychological and if you're flying the airplane instead of the box, shouldn't give trouble if you'll just practice.

Rain also presents problems if you wear glasses. Get a hat that protects the lenses and take it along. Some contests are flown in weather you wouldn't believe. Some contests are won by guys you wouldn't believe either, so be prepared.

That's about it, except to ask that you say hello to Kraftweirickspreng for me on your way to the winner's circle.

I've never met them.

Taylor, Fliteglass Laminates, and P-51 kit.

Phil Kraft and Gold Medal Series propo.

Rand's hard working Herb Abrams.

Bob Dunham and Orbit micro propo.

New prefab Chipmunk from Tech Aero.

John Tatone displaying new mufflers.

John Maloney, World Engines, talks to attendees.

Walt Schroder, MAN's RCM's booth.

# M.A.T.S.

## 3RD ANNUAL MODEL AIRPLANE TRADE SHOW

**Attracts January 6-7 . . . Miniature Proportional System New Covering Materials Highlight Southern Californi Affair.**

RCM photos by: Dick Sonheim • Ken Willard • Bill O'Brien

A happy Jack Stafford — Stafford Models.


Wing Mfg., and plans kits.

Jerry Krause with new E. K. system.

Sid Axelrod and Top Flite's MonoKote.


Jerry Nelson's 12' glider attracts throng.


K & B's Johnny Brodbeck & daughter Ginny.

Joe Martin manning Micro-Avionics booth.

Frank Kagle with Bonner 4F equipped Nieuport.

Hank & Milt, Balsa Corp., with new Coverite.

Stinger's fine array of R/C boats.

Bill Hanna with new Heathkit propo.

Mr. and Mrs. William Hall and Hallco display.

erry Johnson, the 'Motor Man' and Taipan line.

Lou Proctor was always busy answering questions.

Charlene Jones, Miss PCS, and friend.

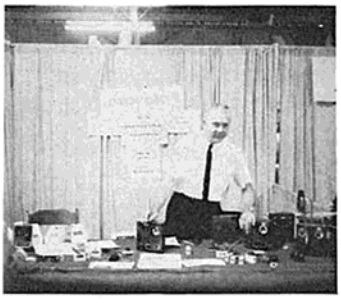

Finishing Touch Decals and Lanier display.


Vintage Aircraft kit on display.

RA/CAR's spectacular R/C racer.

Larry Williams admires La Jollita.


Midwest's booth with new kits.



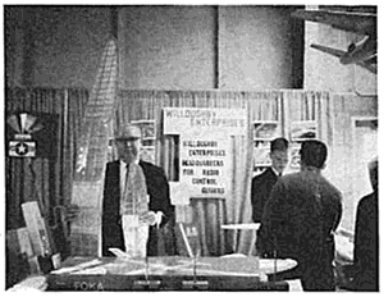
Cannon Electronics and new R/C gear.


Bill Welker with CitizenShip display.


Cox Engines booth with popular line.

Airtrol — operating out of suitcase or two.

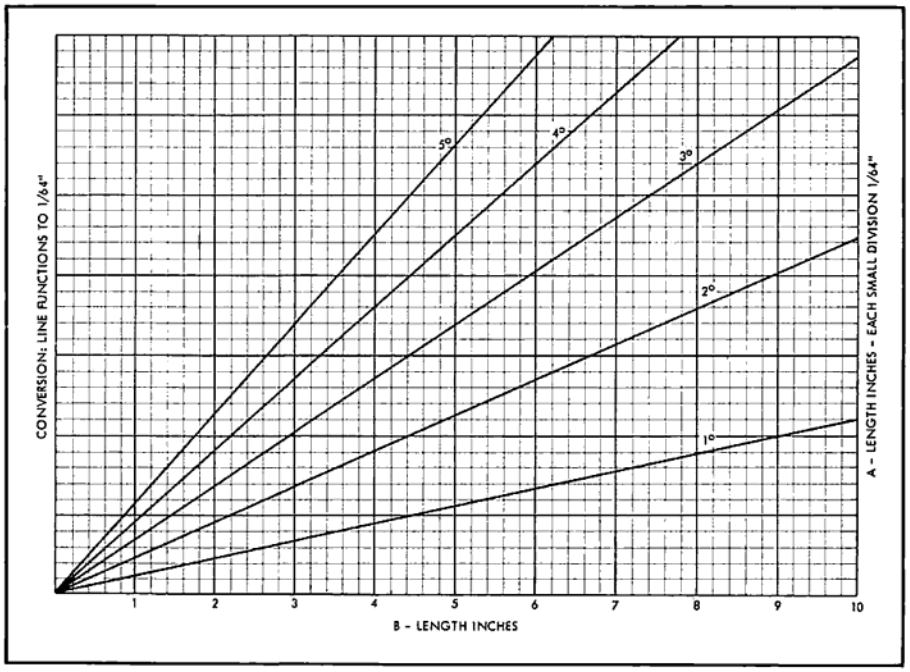

SPL's Shrink-Tite booth — always a crowd.



Dale Willoughby — the glider man par excellence.


K & K Fiberglass with magnificent Rivets.

Plans Parts Service — Jerry Falk.




# TRAMMELING

**In today's era of proportional R/C where "anything will fly," P. W. Preston revisits a forgotten art . . . . . .**

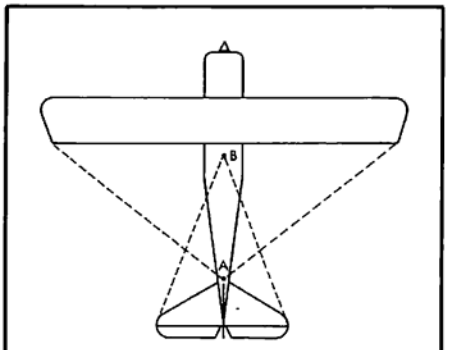
WOULD you try to run a race with your head and shoulders aimed off to the right? Well, you ask your airplane to do that, and worse, if it is misaligned. For example, if the wing is tilted the plane tends to bank. This creates a turn which is usually corrected by offsetting the rudder until the yaw produced cancels the effect of the built-in bank. Reduced efficiency and increased loading of control surfaces results.

All that is required to properly align an airplane is a piece of string with a pin at one end, a 30°-60° triangle, and a 6" machinist's rule. The rule should be taped or epoxied to the triangle as shown in figure 1, with the 1/64" divisions at the edge. The string must be non-stretching, most synthetic materials will not do.

The graph is the sine or tangent functions of small angles expressed in fractions of an inch. With this table it is easy to accurately set up incidence and thrust without resorting to a protractor. For lengths greater than on the graph multiply A and B by any convenient factor; e.g., for a deviation of 3° at a distance of 40" (4 x 10"), the displacement would be 2 3/32" (4 x 33 5/64" divisions).

**Dihedral** — Place the wing on a flat surface, blocking up the trailing edge on symmetrical sections so that the chord is parallel to the surface. Refer to figure 2 and measure the height to the leading edge at the tip (alternately measure to the chord and subtract the chord height from the reading). If the dihedral is expressed in degrees, convert the reading using the table.

**Wash-In/Wash-Out** — Compare the leading edge height at the chord with the trailing edge at each rib. Be sure to check both wing panels as this can upset flight trim drastically. Steam the wing and block until it conforms to the specifications, usually no wash-in or wash-out.




ALIGNMENT
FIGURE 3

**Alignment** — Install the wing and stabilizer using the fasteners with which you will fly (this insures that no change is caused by the tension of the hold-downs). Place a pin in the fuselage at point A of figure 3, exactly in the center of the fuselage, and measure with the string to each wingtip. Skew the wing

*(Continued on Page 37)*

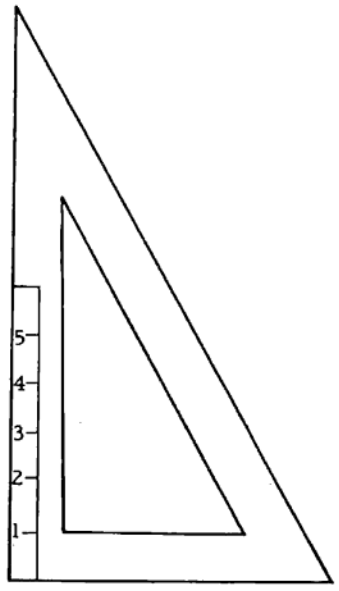
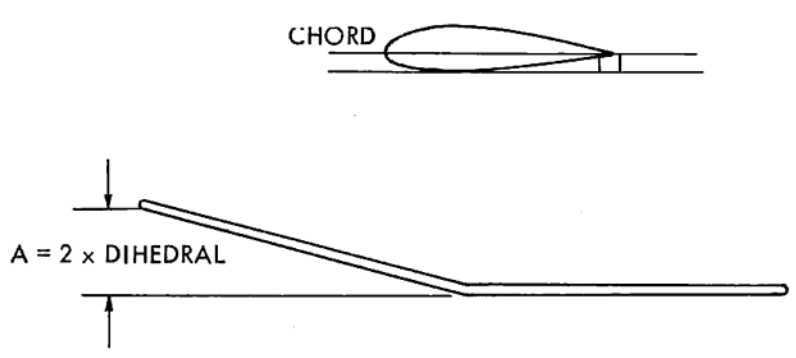



FIGURE 1




DIHEDRAL MEASUREMENT

FIGURE 2

## TRAMMELING

*(Continued from Page 36)*

in the saddle until the distance is equal and then install pegs or blocks to return it to this position each time it is installed. Follow the same procedure for the stabilizer using point B of figure 3 as the reference.

**Landing Gear** — Check landing gear run-out as above with a reference near the tail. This will allow the airplane to travel in a straight line on the ground. Then check the landing gear height by measuring as in figure 4. This should be adjusted for as level a condition as possible as later checks will depend upon it for accuracy.

**Tilt** — Block up the tail until the wing chord is parallel to the surface as in figure 5. The height of the wing tips should now be equal. Likewise, the tips of the horizontal stabilizer should be parallel to the surface. Adjust either one by shimming the saddle and then recheck the alignment.

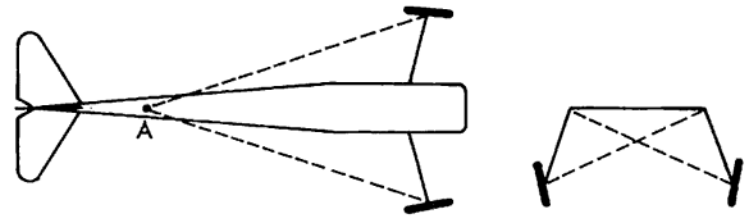
The top of the vertical stabilizer should be equidistant from the horizontal stabilizer tips. Offset of the vertical stabilizer can then be checked by placing the long edge of the triangle against it and along the fuselage. Zero offset is indicated by the triangle falling one-half the width of the stabilizer to the side of point B on figure 3.

**Declination** — Referring to figure 5, block up the tail until the longitudinal axis (or the reference specified in the plans) is parallel to the surface. Measure and adjust the incidence of the wing and horizontal stabilizer using the graph to convert from an angle to fractions of an inch. Positive angles denote a leading edge that is higher than the trailing edge.

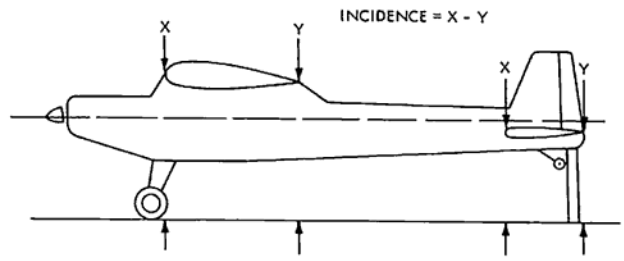
It is a good idea to repeat the alignment checks if shims are placed under the wing or stabilizer. It is also wise to glue the shims in place so that they will not shift or fall out.

**Thrust** — Place the airplane parallel to a wall with the tail blocked up as shown in figure 6. With the propeller horizontal and touching the wall with one tip, measure the distance to the other tip from the wall. This distance is A on the graph and B is the propeller diameter. Read the graph for side thrust. Repeat the procedure with the propeller vertical for down thrust.

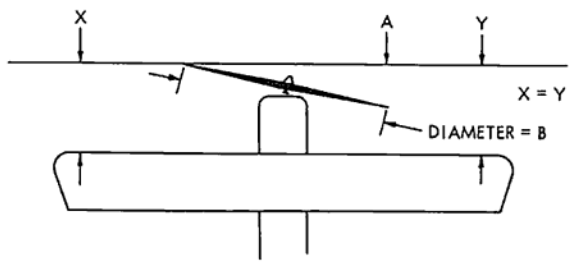
Now, about that title. Trammeling is the forgotten art of aligning an airplane by adjusting the tension on the wires that hold the wing and tail, a la Curtiss Junior, etc.



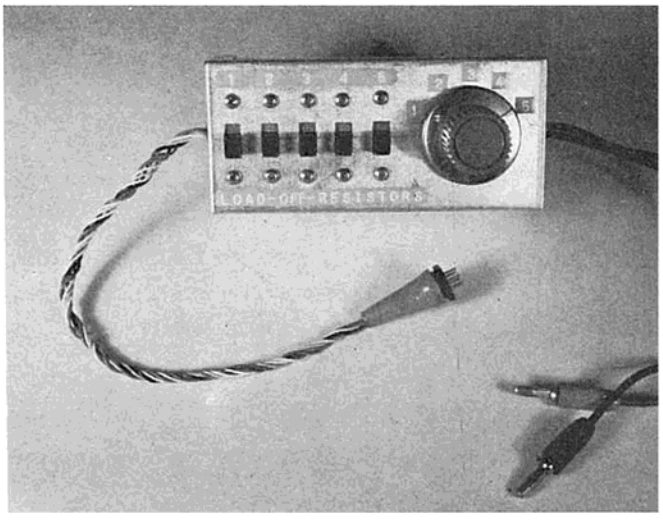

LANDING GEAR ALIGNMENT
FIGURE 4

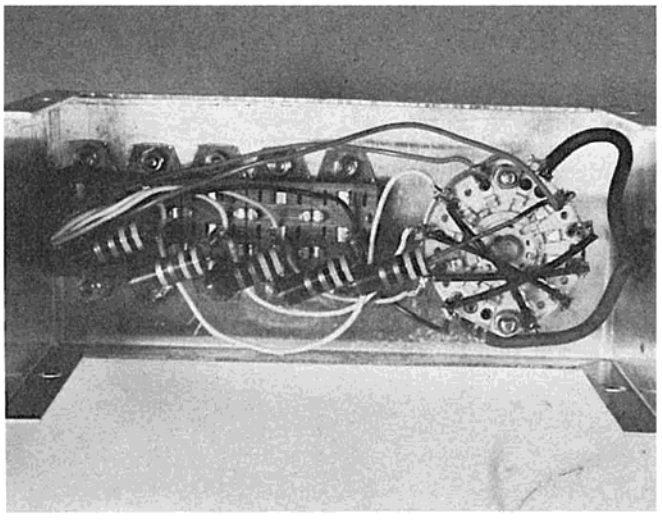



DECLINATION
FIGURE 5



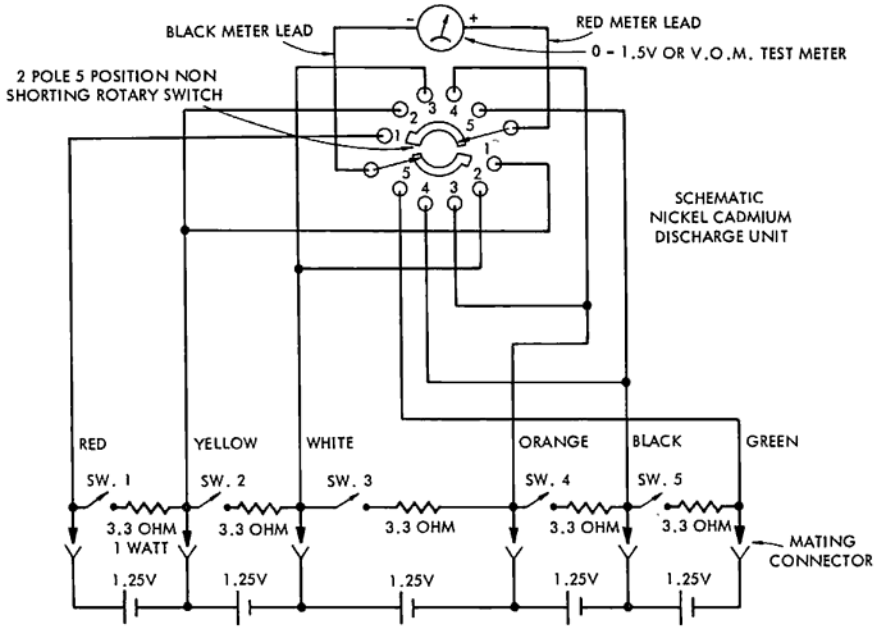

THRUST ANGLE
FIGURE 6



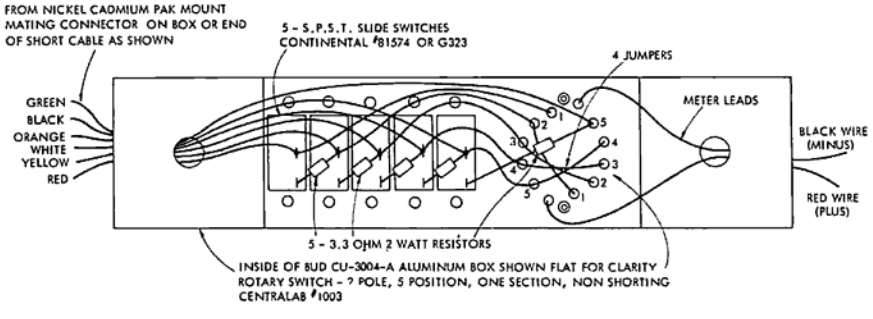



# BATTERY DISCHARGER FOR NICKEL CADMIUM PACKS

By L. Jack Weirshauser




5 CELL NICKEL CADMIUM PAK




NICKEL CADMIUM BATTERY DISCHARGE UNIT

**TECH EDITOR's NOTES:**
*This article, on the Battery Discharger, is in response to many letters and will benefit all who build it. During RCM's technical evaluation of this unit two receiver packs were found to have a defective cell. In both cases the cell's capacity to supply current was reduced to approximately half of their M.A.H. rating. Periodic checks of your batteries' condition will eliminate one cause of mysterious and unexplained failure. This is especially true of older equipment with a long history of satisfactory performance.*
*In order to use the battery discharger as designed, each cell in your pack will have to be terminated at the plug. If you have commercial equipment and don't want to modify it you can monitor two cells at a time. For example if you have a 4 cell pack with a center-tap you can check both halves by using two 3.3 ohm resistors in series across each side. This will still give approximately 350 M.A. load current and allow you to monitor battery condition. The unit can be used as is for this purpose if you wire red to + 4.8, white to centertap and black to – 4.8. You will then have to throw both S1 and S2 and/or S3 and S4 to load the battery pairs.*

THIS is a companion unit to the Amp Gate Charger which was published in the July 1967 R/C Modeler, and was described briefly in the text. This gadget is a must for anyone who uses the small Nickel Cadmium batteries and is concerned with battery reliability.

The whole secret of the Amp Gate Charger (see July 67 RCM) was the fact that it charged each cell in the pack individually, and automatically removed the charge from the cell as it became fully charged.

This device works in a reverse manner, in that it *discharges* each cell in the pack individually and the individual load across each cell can be removed as the cell reaches its lower end point of 1.0 to 1.1 volts.

As you can see from the schematic there is a switch and a load resistor for each cell in the pack, and a rotary switch that connects a voltmeter across any cell you select so that you may measure the loaded or unloaded cell voltage.

*(Continued on Page* **41** *)*

# SHOP & FIELD

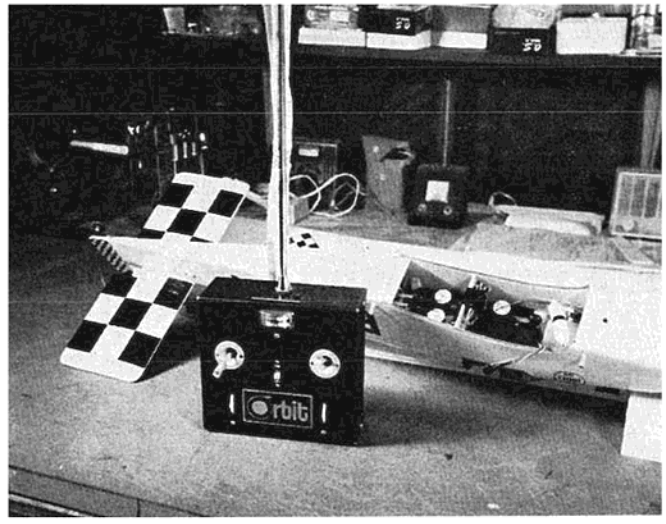
**DON DEWEY**
**Editor**

•

**KATHLEEN ACTON**
**Assistant Editor**

**FUNDAMENTALS OF R/C • PRODUCT REPORTS • HINTS AND KINKS**

Dick Riggs' full house Bebe Jodel, built from Midwest kit, and equipped with Orbit 612 IC and Webra .20.



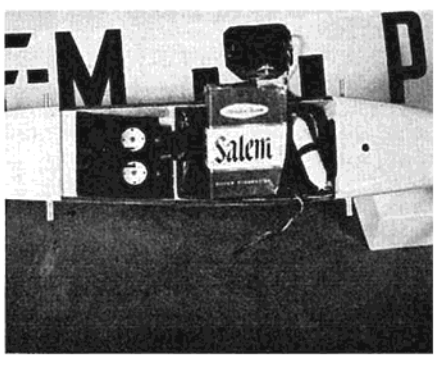

The Bebe Jodel on RCM Editor's workbench. Note installation. Nitrate dope, urethane color, and MonoKote trim.

# ORBIT INTRODUCES LIGHTWEIGHT DIGITAL

DURING this past month, R/CM had the pleasure of viewing the newly developed Orbit Electronics 612 IC digital proportional system. With a weight of under 16 ounces, this new six channel system is ultra small and extremely powerful, making it a top contender in the digital manufacturers race to present new, lightweight R/C systems.

The 612 IC is provided with four servos of extremely small size. These were tested and found to have an average thrust of four pounds each. Three outputs are provided as with the larger Orbit servos — in fact, although the physical size has been reduced, the general internal mechanical construction remains the same, as does the actual servo thrust.

Close-up of installation illustrates small size of new Orbit servo.



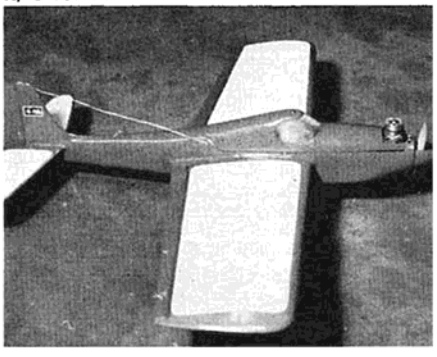

The receiver is small, utilizing integrated circuitry for decoding. The same proven, all-silicon Orbit front end is incorporated in this new unit.

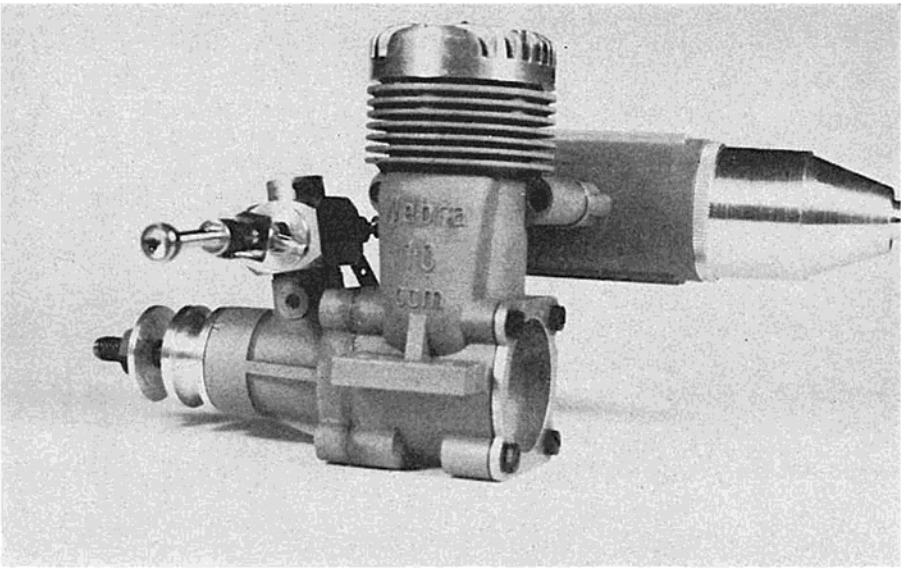
Price and further details were not available at the time of this writing, however the Orbit 612 IC will be generally available on or about February 15th.

One of the most interesting features of this small system was the amount of power and versatility of the servos. The two test aircraft provided R/CM by Orbit was — and hold on to your hats — a Sterling Super Ringmaster control line kit, modified for R/C and built by Don Mencimer of Orbit. The 42" span of the Ringmaster was cut down to 35½", the wing chord cut and full span ailerons installed, and the fin modified for rudder action. The landing gear was mounted in the wing instead of the fuselage. The entire top of the front half of the fuselage was removable for access to the radio equipment. At 2.5 pounds, ready-to-fly, the Fox .15 R/C in the nose of the Ringmaster was more than adequate. Flight tests not only proved the capabilities of the radio system, but proved that the Ringmaster was capable of virtually the entire AMA pattern!

The second Orbit test ship was Dick Rigg's modified version of Midwest Product's Bebe Jodel kit of yesteryear. Finished in lemon yellow urethane over nitrate with Monokote trim, the Bebe Jodel, too, weighed in at under three pounds. With ailerons added and some of the kit designed decalage removed, the 46" span Jodel made a most remarkable aircraft. The photographs illustrate the size of the Orbit 612 IC radio installed in Dick Rigg's aircraft.

Sterling Super Rigmaster converted to R/C for the Orbit 612. Flies well!





The new Webra .61 R/C, complete with muffler.

**SHOP & FIELD PRODUCT REPORT:**

# WEBRA .61 R C

## MRC-Enya's newest import is important addition to current line of engines.

The past year has brought forth a great many new engines in the larger displacement sizes. Among the newest is the Webra .61 R/C, made in Germany and imported into this country by MRC-Enya, the same company that imports the very popular Enya .60. As a matter of fact, we wondered why the MRC-Enya company would import a competitor to an engine that has literally set new standards of reliability and performance, as has their popular Enya.

The Webra concern has long been famous for its diesel and smaller glow engines, the big .61 marking their first entry into the larger engine class. The mill, itself, is a handsome, rugged piece of workmanship. Both the front and rear cases bolt to the main case. The rear case is held by four hex head bolts, while the front cases is secured by four massive Allen head bolts. The engine head is bolted on by Allen head bolts. A special hex wrench and an Allen wrench are furnished with each engine. The beam mounts are thick, square, and rugged. The exhaust stack is designed for quick attachment of the Webra streamlined muffler. This is a single ringed, double ball bearing mill that evidences a high degree of craftsmanship throughout its overall construction.

The two engines obtained by R/CM for testing were production models and had not previously been run. The first unit was removed from the box, bolted to the test stand, and started on the fourth flip. Two eight ounce tanks of fuel were run through the engine, adjusted for a rich setting, and then we set about to adjust the throttle for a good idle.

The throttle is different from the normal type in that in addition to the standard needle valve, there is a second needle valve that closes off the fuel flow when the throttle is moved to the idle position. To understand the Webra TN carburetor, it should be pointed out that the high-speed, or main, needle valve controls full speed range only, whereas the throttle needle controls the amount of fuel when the engine is at idle. The taper of the smaller, or idle needle, controls the speed range between high and low. The advantage of this type of carburetor principle is that, when properly adjusted, the suction of the engine is adequate to overcome any fuel problems when the mill is throttled down, regardless of whether the fuel tank is full or nearly empty.

The first Webra .61 test model was tached at 12,000 RPM on the top end using a 12/6 prop, and dropping to 2400 RPM on the idle side. This was before break-in was completed.

After the two break-in tanks were run through the .61, the engine was bolted to a Tatone mount and installed in one of our stunt ships — our feeling being that a product report on an engine is of little value unless the engine is actually tested in the air. An added plus was that the mounting holes on this engine exactly coincide with the mounting holes for the Enya .60. It would be nice if all of the engine manufacturers could standardize the mounting holes locations — at least in the larger engines.

Air tests proved to be just as good as the bench tests had been. For flying, we used an 11/8 prop, and when leaned out to a slightly rich two-cycle, the Webra yanked the ship off the ground just as fast as our well broken-in Enya's. Once in the air, another plus was evident — this engine, without muffler, ran much quieter than other large mills. Several test flights were made and the engine pulled well in all positions.

The most impressive feature on this new engine is the carburetor, and it is claimed that a much more positive idle is gained without "loading-up" when the throttle is advanced from a prolonged idle. The claim is a fact! We let the plane sit on the ground and idle for a full five minutes, then advanced the throttle. It picked right up without the choking and gurgling that has become almost commonplace. The sliding cam action throttle barrel, coupled with the needle valve that shuts down the fuel, accomplish their job nicely. Setting the idle is a snap.

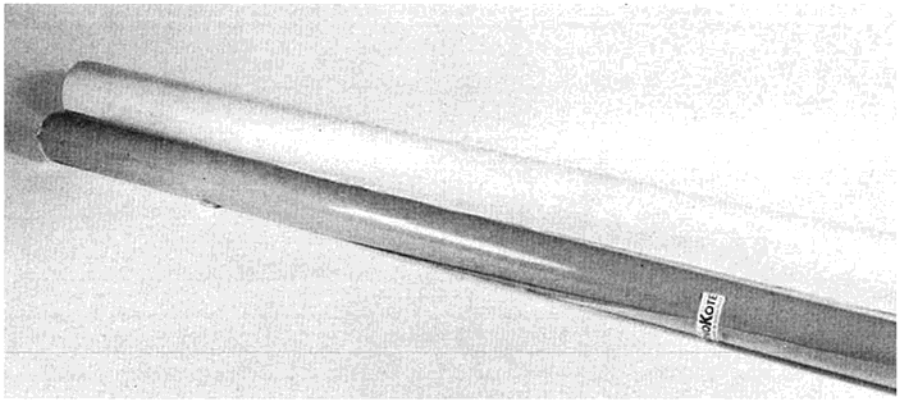
One peculiarity we noticed during flight tests was that the flights seemed particularly long for the amount of fuel carried, so we decided to time the runs. On the third flight we used a stop watch, starting the timer as the engine started, and flying the flight at full throttle, and high enough to permit a dead stick landing when the engine quit. It finally stopped at fifteen minutes on a twelve ounce tank, which is approximately three minutes more flying time than we have gained with other .59-.61 size engines.

The muffler available for the Webra .61 is a lightweight, streamlined unit that quite effectively cuts back the noise without reducing power substantially. Compared to other big mills, equipped with the manufacturers recommended mufflers, the Webra equals them in silencing while maintaining a higher output. Without the muffler, the Webra exceeds the torque output of any other R/C .60 tested to date. It will, in fact, develop a high peak b.h.p. without running at excessively high speeds.

There were several criticisms noted of the original prototype. One was that the exhaust baffle blade was made from soft aluminum sheet and simply would not hold up. After three flights the pushrod hole had worn to a sloppy fit, and several flights later, was unusable. The second bad feature was the method of mounting the throttle barrel into the case intake. In the Webra, as in several other engines, the carburetor is held in place with small set screws, and these do come loose. In fact, during two of the initial three test flights, the throttle worked its way loose. The set screws were too small, and the last tightening stripped the threaded portion on the case. We reported both of these items to MRC-Enya, and the second production unit, received several weeks later, reflected these changes in the manufacturers overall design.

We predict, that when deliveries can meet the demand, the Webra .61 will be one of the top notch big engines. As mentioned, the power output is excellent, one reason lying in the intake venturi being about thirty percent larger in area than other .60 size engines, in itself allowing this engine to run faster and put out more power. Coupled with the unique Webra .61 carburetor, we feel that this engine will be in demand by the performance minded contest fraternity.

The MRC-Enya Webra .61 R/C has been tested, and is approved and recommended by R/CM.



In the foreground, a roll of red Super MonoKote. Behind this, a roll of Balsa Corporation Coverite, the latter material scheduled for testing in the April issue of RCM.

# WHAT ABOUT THOSE NEW COVERING MATERIALS?

## PART I: RCM's Shop and Field tests the new Super MonoKote, from Top Flite Models, Inc.

DURING the past year a substantial number of articles have been written on the use and application of Top Flite's MonoKote, the mylar type material with the built-in finish. Although MonoKote has had its advocates, we must admit to not having been members of this group. Although, admittedly, a model can be covered and finished faster than with any other type of material, we found many disadvantages, such as sagging (unless prior silkspan covering was used) between open framework members, very noticeable seams, difficulty in covering compound curves, and surface tension variations with outside temperature changes.

All of this apparently, has been remedied with the all-new Super MonoKote by Top Flite. This new material, provided in .001" thickness, had a dry adhesive on the back unlike the regular MonoKote. In fact, it was slightly difficult at first to determine which side "was up." Since this dry adhesive does not stick to itself, it is much easier to handle. During the process of covering an entire aircraft with the Super MonoKote, we found that it was far easier to apply, adhered uniformly, and covered compound curves with extreme ease. Very little overlap of material was required since there was no slippage during the shrinking process. No initial "pre-covering" of open framework surfaces is required with this new material since there is no noticeable deviation in surface tension. Due to the thickness of the material and its excellent adhesion, seams are virtually unnoticeable. Sealing of the seams with clear epoxy to protect the edges of the engine compartment area was not found to be necessary since the adhesive and the material was completely unaffected by fuel.

For trim colors, regular or "wet" MonoKote was recommended. This is applied without heat, simply by cutting out the desired trim pattern and pressing into place over the Super MonoKote framework. The edges of this material are covered with a thin brush coat of clear Hobby Poxy. No "under-surface" bubbles were obtained, and the combination of the old and new, or Regular and Super MonoKote is the fastest known method of covering and finishing a model aircraft. We also discovered that it provides a beautiful finish—the "plastic toy-like" appearance of the glossy material being subdued to a fine, hand-rubbed finish by the application of DuPont White Rubbing Compound followed by wax. What remained was to test for overall strength.

After flying our test ship for some time in various temperature conditions (and this included running applied temperatures from freezing to 125 degrees F) we were satisfied that no surface deviation would occur and that the material was impervious to model aircraft fuel. The test aircraft was then flown to a sufficient altitude and dived under full power into a wooded area. The resultant impact completely severed the conventionally built fuselage in two although the Super MonoKote still held intact on one side! In addition, the wing was completely intact with only one small puncture, which was easily repaired.

In conclusion, we have found Super MonoKote, and the usage of Regular MonoKote as trim, to be an excellent combination, providing a good looking, strong, and fast finish. R/CM, having withheld its recommendation from the original MonoKote, does not hesitate to put its tested, approved and recommended stamp on this new material from Top Flite. This is an excellent addition to our hobby industry.

The material, now available, is 25½" wide and is priced at $1.35 per running foot in six foot rolls or by the running foot. Presently available in red, white, orange, yellow, sky blue and aluminum.

RCBookcase H.E Hisat

## BATTERY DISCHARGER

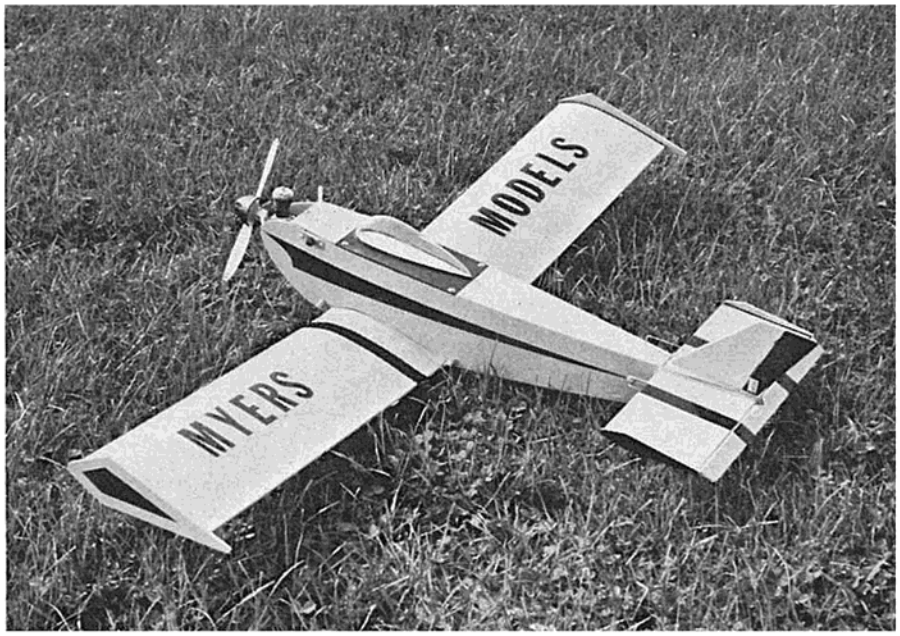
*(Continued from Page 38)*

For example:

First turn off all of the load switches and then connect the pack to the discharger, now connect the discharger to the voltmeter. You can now rotate the rotary switch and measure the unloaded cell voltage of any cell in the pack. Now turn on one or any of the load switches and measure the loaded cell voltage of any cell you choose. These two voltages may be almost the same when you first measure them, but as time goes by you will see the cell voltage starts to drop off, and after 75 to 90 minutes, depending on the cell capacity, the cell should have reached its lower end point and you can remove the load from that cell by merely turning off the load switch. Simple, eh?

The load across each cell is nominally 350 ma. which is a "stiff load for 500-600 mah batteries and you can spot any cell in the pack that is inclined to discharge a little faster than the others or perhaps is a little slower in accepting a charge. In any case, you can now be aware of any potential source of trouble and take steps to prevent the disaster that is sure to befall you when you have an in-flight battery failure.

The unit shown in the photographs was built to be used with a pack containing up to 5 cells (6 volts), but by adding additional switches, resistors, and a rotary switch with more contacts you can enlarge the unit to suit your individual requirements.




Meyers Models' Jr. Pathfinder with Cox .09 and Min-X Galloping Ghost.

## SHOP & FIELD

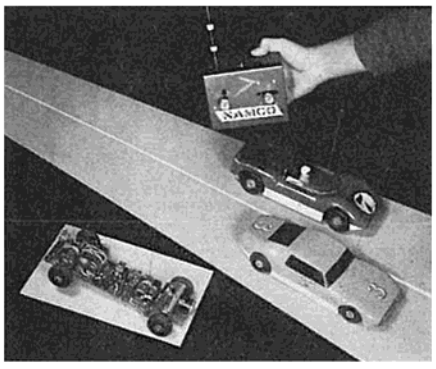
## PRODUCT NEWS

Two new kits from **Midwest Products Company, 400 S. Indiana, Hobart, Indiana 46342,** include the Bonzo and Hoosier Hotshot, first published in R/C Modeler Magazine. Each of these designs is a midwinger, easy to construct and easier to repair, utilizing the Midwest molded foam wing and stabilizer. Designed primarily for sinsingle channel (rudder only or Galloping Ghost) they can easily be fitted with small multi channel gear. Also included in the kits is a wing template for cutting the wings down from a 44" span trainer to a racing span of 38". Designed for .049 to .10 mills, both kits list for $9.95 each.

**Maislin's Hobby Distributors, 1529-41 South 22nd St., Philadelphia, Pennsylvania 19146,** a distribution, import and export firm since 1917, announces the availability of the complete line of Dee Bee ARF (almost ready to fly) aircraft. Superbly finished and constructed of high quality plastic, these aircraft include complete instructions for rapid final assembly. Included is the Stinger II and the Thunderbird, both units priced at $55.95 each. Available in color. Dealer inquiries invited.

**Myers Models, Stewartstown, Pennsylvania 17363,** had introduced two new kits — the Pathfinder, and Pathfinder Junior. The former is a 54" span low wing model with high wing stability. Designed as an "all purpose" multi, a .19 engine can be used to provide a docile trainer that a beginner can actually fly. With a .35, the Pathfinder comes on strong! The smaller model is a 41" span version of the same aircraft designed for .049 to .15 engines and Galloping Ghost or small proportional system. Each kit includes the Myers May-Ply one piece fuselage sides made from 1/8" white plywood. Wings and stabilizers are built-up and sheet covered. One piece wing sheet covering. Assembly time is 10 hours or less. All parts are pre-cut. Hardware and canopy included. Pathfinder is priced at $26.95 while the Jr. Pathfinder is $12.95.

**North American Hobbies, 7423 Bacon Rd., Petersburg, Mich. 49270** is presenting to the car model builder and racing enthusiast a full line of radio controlled race cars in 1/16 scale (approximately 10" long). The NAMCO R/C car is a fully developed and tested model racing car with servo type fully proportional steering and proportional throttle control. Six operating frequencies are currently available allowing six cars to be raced simultaneously. Available in two body styles, the GT Coupe and the Roadster, the Namco car may be purchased as a complete set, including the car, transmitter, all batteries, standard charger, and complete instructions at $99.95. Also available in kit form.




**The Brookstone Company, 830 River Road, Worthington, Mass. 01098,** has released their newest catalog of fine quality, hard-to-find hand tools and small electronic tools. Included are many tools which are not only useful, but almost indispensable to the serious RC'er. Many of these are virtually unobtainable elsewhere. We strongly recommend that you obtain a copy of the current Brookstone tool catalog. Price is 25c per copy.

**Orbit Electronics, Inc., 11601 Anabel Ave., Garden Grove, Calif.,** has produced their newest catalog with the modeler in mind. Specs for each Orbit Digital Guidance Sys-

(*Continue on page* **44**)

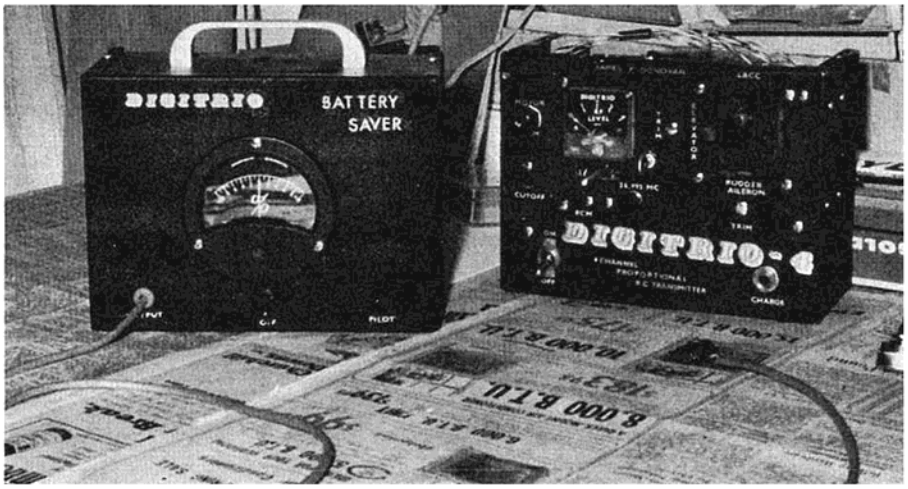
## STARTING NEXT MONTH! THE RCM 'CLASSIC'

RCM is proud to present Ed Thompson's new digital proportional system designed for *you* to construct. This system is destined to become the classic of the industry, and is as much of a "no-compromise" system that could possibly be developed. It is designed so that you have a choice of several types of sticks, operational modes, and two, three, four, five, or six channels of operation. The electronic design introduces many new concepts and techniques — many of which have not yet been utilized even in the commercial field. The power, resolution, and overall performance will amaze even the most discriminating digital technician. In addition, and for your convenience, arrangements have been made with Royal Electronics to provide complete electronic and mechanical kits of the RCM Classic concurrent with the publication of the articles. What we're trying to tell you is that you won't want to miss this series of articles — the most exciting and challenging ever presented in a model publication.

**. . . The RCM Classic . . . a system you will be proud to own and fly, for many years to come.**

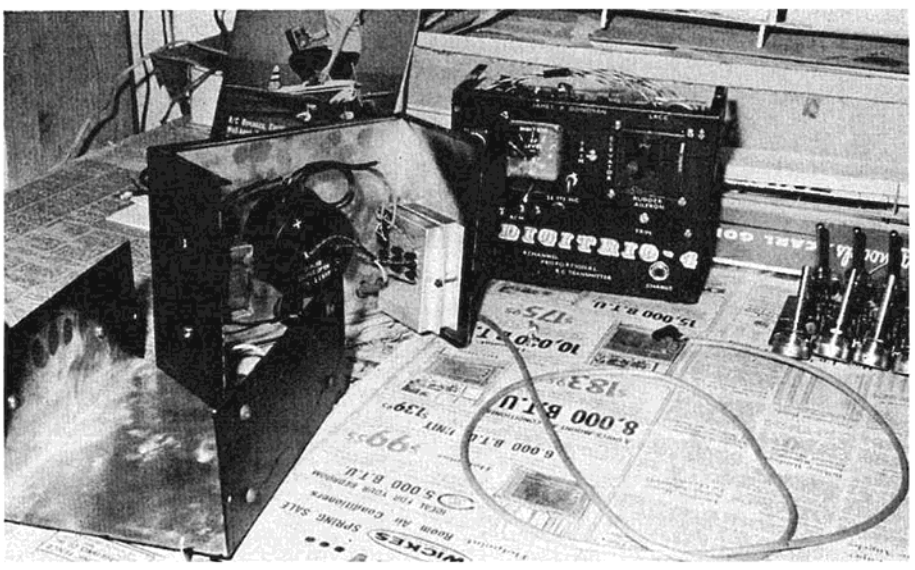
**— The Editor**

**R/C MODELER MAGAZINE**




# DIGITRIO BATTERY SAVER

## By J. P. Donovan



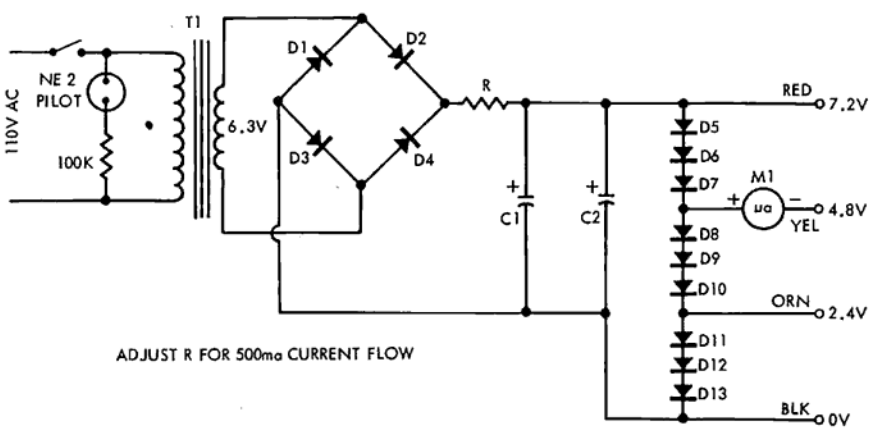




FIGURE 2

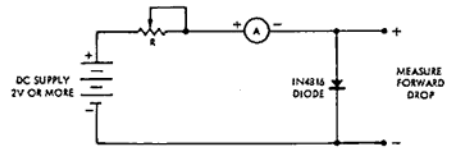



FIGURE 1

*TECH EDITOR'S NOTE:*
*RCM has checked Mr. Donovan's Battery Saver and have found that it works very well and will be of interest to the experimenter. Mr. Donovan uses the Battery Saver for his Digitrio and also for one of his reed system. The milliamp meter in the unit is shunted with R/C hook-up wire wound on a ⅜" dowel. Proper length of hook-up wire will be determined by the meter used and will have to be found by experimentation. Of course if you obtain a 500-0-500 milliamp meter no shunting will be necessary. Mr. Donovan is also working on an 8 channel Digitrio and the transmitter P.C. board can be seen in the photos he supplied. It is the P.C. board with all the pots attached to it.*
Note: *Mr. Donovan uses 2.4 V for the bias cell instead of 1.25 v to insure against marginal operation of the voltage regulator in his Digitrio.*

HOW many times has radio control equipment needed bench work (testing, tuning, alignment, etc.) before flying? Then when the work is finished you find the batteries are run down or too low for safe flying. The purpose for the Digitrio Battery Saver is to eliminate all ground drain on the airborn battery pack.

It uses a novel hook-up of silicon diodes. Multi channel packs require a very stiff power supply with extremely low internal resistance. This circuit uses the forward drop characteristic of silicon diodes, which results in a very stiff, low internal resistance, very stable power supply. The circuit uses a rugged (1 amp or better) filament transformer. The AC is converted to DC by a bridge rectifier. Silicon diodes are used as a load with a fixed current flowing through them.

The forward voltage drop of a silicon diode is very stable over a wide range of currents. Diodes are stacked to get the proper voltages for the equipment.

A simple DC supply (2V or more) is used for testing the silicon diodes for forward drop. The current through them should be somewhat higher than the proposed current drain of the equipment. I set mine at 500 ma for the Digitrio. (See Fig. 1)

The units I tested were Westinghouse IN4816 silicon diodes. The majority of them measured 0.8V forward drop. Thus, I used three in series to supply 2.4V (the equivalent of two nicads).

Other than the nonstandard use of the silicon diodes, the rest of the circuit is straightforward. Referring to drawing Figure 2, D1 through D4 form a wave bridge for rectification. I used surplus capacitors for filtering. Filtering may vary with the equipment. I found that two 1500 mfd capacitors in parallel work nicely with the Digitrio.

A meter is placed in the servo center tap

*(Continued on Page 44)*

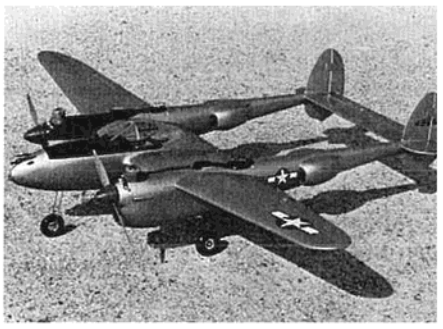
## PRODUCT NEWS

*(Continued from Page 42)*

tem are spelled out clearly. Crisp photos of each piece of gear, along with dimensions and weight of each airborne element are really helpful in matching Orbit RC equipment to your own models, those seen on these pages, or kits. Free copies of the new Orbit Digital Catalog are available directly from Orbit Electronics.

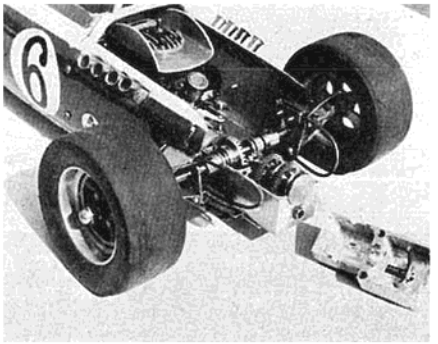
With the new and highly reliable radio control gear on the market now, building is more of a chore than ever. Your time spent building could be time spent flying. **Nelson Custom Building Service, 802 Hanna Blvd., Waterloo, Iowa 50701,** is equipped to build the airplane of your choice from kit or plans. Seventeen years of experience insure top quality workmanship. No job is too small or too large. Also available will be complete ready-to-fly packages for the beginners, including airplane, radio equipment, engine, etc. RCM readers are invited to write Nelson for further details.

**Royal Products Corporation, 6190 E. Evans Ave., Denver, Colorado 80222,** announces the release of their scale P-38 kit, designed for twin .35 to .61 engines. Wing span is 74½" with an area of 695 sq. in. Fuselage length is 50¾" with an all up weight of 9-10 pounds. Price is $44.95. Dealer inquiries invited.



**Rand Manufacturing Co., Inc. 8909 Hubbell Ave., Detroit, Michigan 48228,** is currently manufacturing their 1 amp 3.6V battery pack with plug, catalog item #7000 This General Electric three cell 1 amp pack is available as a separate item to retail for $14.95. The modeler can use it as a spare or as an original installation. Designed for use with systems requiring 3.6V, such as the Rand Dual Pak, charging should be at the 100 mah rate. For the convenience of the modeler, cells have been housed in a handsome plastic case with a plug harness, ready for installation.


**Ra/Car Developments, 524 West Central Park Ave., Anaheim, Calif. 92802,** is in production on their Sonic RC racing car. This is a ⅛th scale vehicle with a hybrid Indy-Formula I style. The body is molded from unbreakable, heat resistant Lexan with tired molded from butyl rubber. Wheels are sand cast magnesium with five spoke racer mag design. The front end features independent suspension with shock absorbers and torsion bars. The rear end can be independently sprung as well. The engine has a special cooling system which allows the use of .19 engines without overheating. The main feature of the car is a working gearbox with neutral and two speeds forward that can be shifted up or down while the car is in motion. Digital proportional systems are required with three channels preferable. The car can be purchased in kit form or assembled. Prices for a complete kit (without radio) start at around $110.




## DIGITRIO BATTERY SAVER

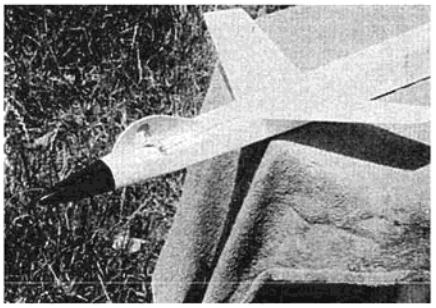
*(Continued from Page 43)*

lead which indicates current in both directions. This meter is very useful in determining any tightness or inferior servo hook-up. When the servos are not running the meter should return near zero in both directions; if not, there is a bind somewhere in the system. One of these unknown binds caused a crash for me due to excessive battery drain.

The enclosed pictures show the completed Digitrio Battery Saver and also an inside view shows the silicon diodes epoxied to the surplus fitter capacitors for good heat transfer.

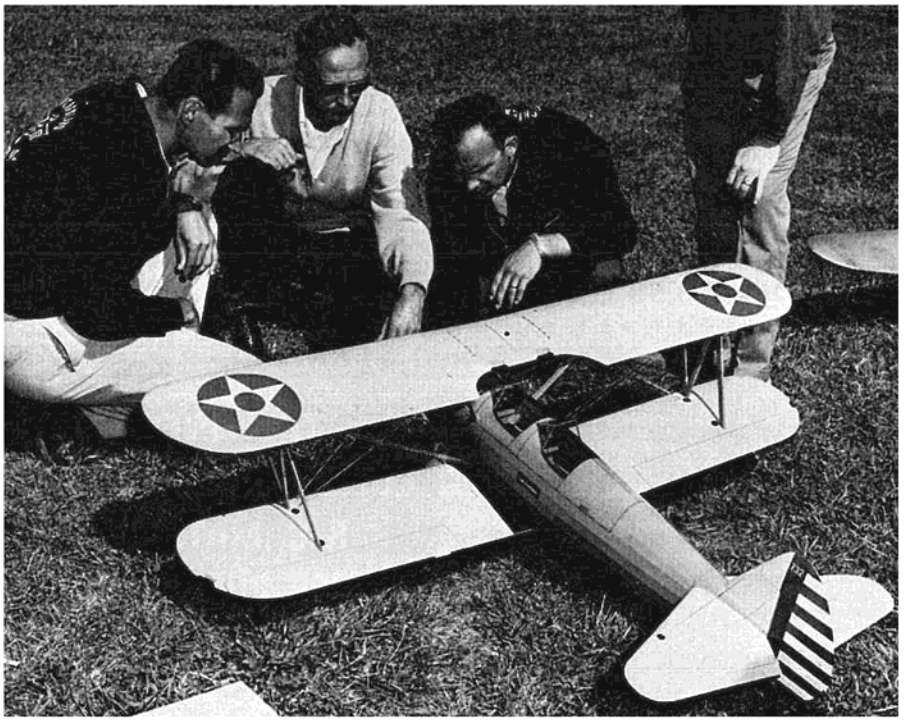
# TOP OUT

JERRY KLEINBURG



French "Preying Mantis" rendition. Pilot "looks" in direction of turn, acts as rudon novelty canards seen at Club des Cigognes "Storks Circus." Preying Mantis was RCM feature in Sept. '66 issue. ( Plessier photo.)

R/C scene at 1967 Cleveland National Air Races. Mentor R/C Club and Cleveland Controlaires combined in 3 day scale and Goodyear fly-fest. Plans include regular NMPRA meet at 1968 Air Races.



Charley Litzau (center) shows details of his epic PT-17 to Chicagoland due at 1967 McDonnell meet. The ship, an outstanding 2" scale masterpiece, is product of two year project. McDonnell annual contest always attracts top scale entries. (MMAC photo.)

Ed Berton and "Spiggen." Enya 60 and 4 bladed pusher prop powers Swedish designed original featured in May '67 RCM. Logictrol 5 handles radio chores.

Janet Berton shows another view of her dad's "Spiggen." Forward winglet is effective control of attraction-getting 9 lb. ship.

**LOST OPPORTUNITY**

**Well, it's definite now. The AMA Contest Board eliminated Classes I and II as official events for 1968 despite extensive efforts by the Advisory Committees of both these classes to prevent the unjustified action. The mid-November vote was conclusive evidence of the CB's lack of faith in the future usefulness of these traditional events as well as its pre-occupation with what they, themselves, fly. Also lost, or certainly greatly diminished, was the chance to encourage "event management" by advisory committees, or steering groups as they've been labelled here, due to CB heavy-handedness and inflexibility.**

All this may puzzle the reader who, as we, saw encouragement in the CB action taken at the Nats and described here in the December issue. At the Nats, assurances were given that the advisory groups would have an opportunity to try improving contest participation and that CB would only act upon the advice of the groups **after** the group had a chance to function. But somewhere along the line, after the congenial L. A. meeting, minds were changed, and the CB reverted to the old narrow viewpoint attitude that has largely characterized its behavior and severely limited its usefulness and appeal to the vast number of R/Cers over the years. Gross contest participation, while inching forward, does not anywhere match the overall increase in R/C activity. And, of course, much of the wariness is attributable to the inability of R/C contest boards to find a way to overcome past pettiness while continuing to rely upon a patchwork quilt of hit-or-miss methods and shortsighted objectives.

Not only was the elimination of I and II uncalled for (ask yourself, just what **positive** good did it do?) but in other actions, such as the ABC Pattern Event and Goodyear, the rules passed were sketchy or inconsistent. AMA headquarters maintains a low opinion of the enforceability of the mandatory progression features of the ABC Event since no machinery was provided to assure order in this regard. Wishing, in this case, will certainly **not** make it so! To match this, creation by the CB of a **Novice** class in the C expert category — almost as an afterthought — seems extremely contradictory as much as it doesn't make sense since R/C novices are supposed to be competing in A and B! It does indicate, however, the Board's own lack of faith in its creation since A and B were evidently only

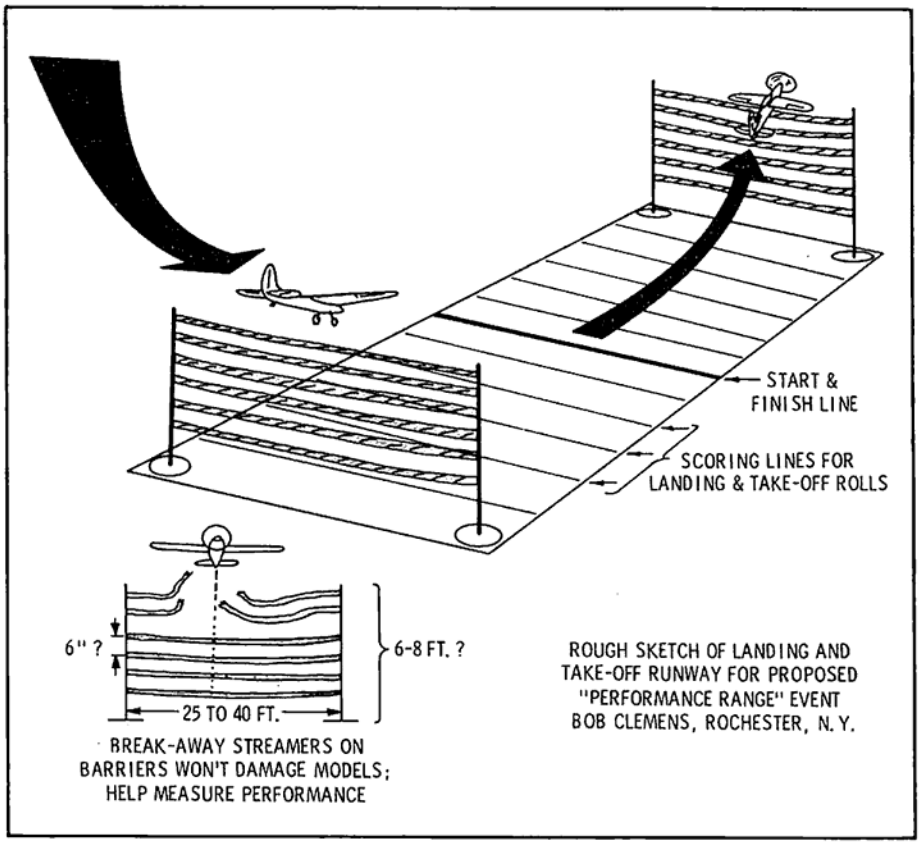
*(Continued on Page* **47***)*

Lou Penrod and Mr. Kim shared top honors at 4th Annual Korean/American meet held at Korean AF Academy. P-51 in background belongs to Charlie Collins, was 2nd in scale. Lou's Citron features vortex tip. Photo courtesy Capt. Merrel Beebe.

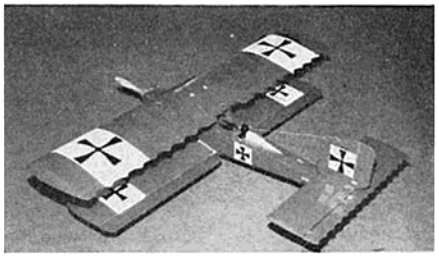
Top Cumberland R/C Club scale ship is aluminum skinned Piaggio. Down under beauty is by team of Ron Steer and Ken Williams, uses Enya 60 and Silvertone 10 reed radio. Flies very well.

Hawkesbury river scene shows aqua facet of Aussie Cumberland R/C Club activity. Taurus is fitted with 42" GB floats, has 700 flights, and uses K&B 45. Silvertone 6 propo and Orbit servos is guidance system.

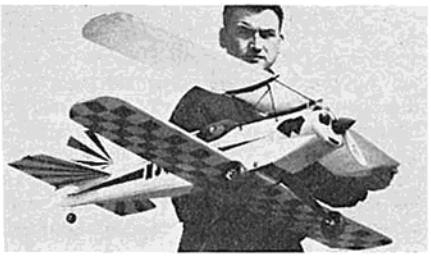
Cumberland Club R/C history pic shows 1961 scene where single-channel ships and Australian-made radios prevailed. Lyell Winley is current president of this leading Aussie club.




HemisFair view of 1968 World's Fair in San Antonio from 6 April to 6 October.



Simple mods produced Acrobat with WWI flavor for Keith Ackman of New Eagle, Pa.



Clyde McCarthey and modified Aeromaster. ST 60 and Logictrol.

## TOP OUT

*(Continued from Page 45)*

thrown in as a rationalization meant to prop up the shaky justification of the C event, which obviously is **the only event in pattern the CB wants anyway!** (Just watch and see if A or B will be a Nats event. . . ) In this way the CB shows it continues to play a form of politics instead of concerning itself primarily with technical development of R/C competition, its only responsibility!

Also proving its strike-out consistency by not being willing to look beyond the first turn as well as in protecting its vested interests above all else, the CB also dumped the 600 square inch Goodyear Continental classification at a time when sensible elements supporting this racing event were trying to prevent further increase in the hazard risk of pylon racing — a situation that currently splits NMPRA opinion. And now there exists an awkward situation where the NMPRA president is advocating the 600 sq. in. event and being refuted by the CB before having a chance to do much about it! We can only join others in hoping an unfortunate accident doesn't provide the impetus needed to bring corrective action. In the meantime, we go on record as advocating **additional premiums and separate AMA liability insurance for Goodyear fliers.** (Sport fliers everywhere wishing to hold the line of AMA dues, ought to watch for a move to allow hiked premiums — for everyone — due to the higher risk type of flying done by only a very small minority of AMA-ers.)

**And as for the future of Class I and II, we have a feeling the Contest Board isn't out of the woods yet. This form of flying is too widespread and popular to permanently bow to artificial restraint and shabby treatment. Certainly not in a voluntary amateur hobby organization. . . .**

**THE NATIONAL SCENE**

NEW JERSEY. No doubt you've read about the successful WW-I scale meet the IBM R/C Club staged at the Rhinebeck Aerodrome in New York. Special events tailored for WW-I scale aircraft were the order of the day . . . Bill Antoine, together with Vern Krehbiel, placed 2nd in the combat event and this is a part of his account of how it happened as described in PRINTED CIRCUIT of the NJRCC:

"The event I really looked forward to was Team Combat, a cooperative demonstration with the object of putting on a realistic simulation of aerial combat between two military WW-I aircraft of the same scale using smoke bombs, sound effects, etc. The score was based upon evasive actions, "firing", passes, placement in the sky, content [of maneuvers], and aircraft proximity. Total time was 10 minutes including 3 minutes for starting and up to 5 minutes combat after the contestants called out starting of combat.

"The judges were none other than Cole Palen and his sidekick and I think they had as much fun as we did. Cole would shoot up aerial smoke bombs during each battle and let go with a shotgun that would scare you half to death!

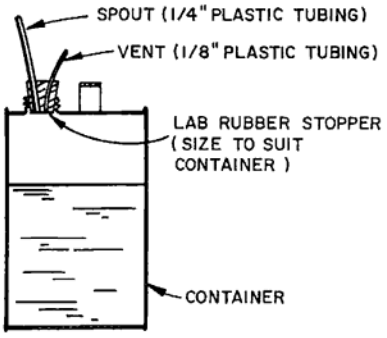
"All other events [Scale, WW-I maneuvers, and Bomb Drop] stopped at 2 o'clock for the combat event, and the only problem was that you had to find a 'rival' yourself. I finally found a fellow with a Fokker Triplane and we proceeded to get ready as we were next up following the 'battle' then taking place. Someone, luckily, asked what frequency we were on and we both replied 27.195! Boy, would we have been shot down — and without a bullet being fired!

"I was now getting panicky, after all this was what I came for. Then the CD said it would be OK if one of the previous fliers would consent to go up with me, and after asking two and getting negative answers, I tackled Vern Krehbiel (VK Products owner) by explaining the situation and assuring him he wouldn't be penalized for making two flights. He then gave his approval and proceeded to fuel up his Nieuport 27 [soon to be kitted] to compete against my Nieuport 28 . . . The rules didn't specify opponents had to be from both sides of the WW-I warring nations, so we could use our imagination in 'battling' it out.

"In the results of the 5 team combat, it turned out we were **less** than one point away from the winners [Jim Hoover and Hale Wallace]. I want to thank Vern for taking me on. It saved the day, and as the saying goes, I had a ball! (And that's how Vern Krehbiel — a real R/C gent — came in 2nd **and** 3rd in **one** event! Ed.)

DELAWARE. Arny Lipschutz relates an amusing incident that proves R/C flying is still an amazing spectacle and mystery to many. While flying at the same time with Carl Cantera at Fenwick Island they drew a crowd of onlookers, many of whom obviously hadn't seen R/C flying before. Arny avers one watcher was heard to remark, "These two guys are telling the two little kids in the planes what to do — and they do it!" This sort of allusion was heightened by a realistic looking pilot complete with earphones in the cockpit of Carl's modified Aeromaster. Another impressed spectator then offered Carl $5 to shoot Arny down and while the discussion was taking place whether or not anyone really had the $5, Arny's engine suddenly quit at an inopportune moment, much to the consternation of the proposer who suddenly regretted his offer. Even after a hasty but uneventful landing and an up close look at the plane, Arny says the uninitiated viewers still believed they had caused "the downing of a friendly plane. . . . "

MISSOURI. Perhaps the finest scale model made lately is Charles Litzau's PT-17. Trav McGinnis provided a complete rundown written by Charley on the ship's development in R/C SPIRIT. Here's a blow by blow account based on Charley's synopsis:




### FUEL POURING SPOUT

JERRY SMITH

Fuel can pouring spout idea by editor Jerry Smith of Tri-Valley RC'ers was featured in newsletter of South Bend, Ind. club. Spout method may be adapted as pressure re-fueler for solderless construction.

1.) The first PT-17, a semi-scale testbed, was completed in 1965 to check the CG, airfoils, and incidence arrangement. (This was prior to the Sterling kit and followed almost a year of scrounging PT-17 or 13 scale data.)

2). Three stress analyses were made to eliminate weak points. (Charley hints these resembled crashes. . .)

3.) The final ship flies like the real 220 hp. powered plane and consequently doesn't cotton to strong and gusty winds.

4.) Wings are made with styrofoam cores but made to show ribs and other scale detail. They are fastened on the model the same way as on the full-size ship.

5.) Solid landing gear struts are fitted with working shock struts. Tires are 4" diameter to match the 2" scale and consist of a tube as well as an outer casing!

6.) The engine is molded epoxy mixed with lamp black.

7.) All insignia and lettering details are painted on.

8.) The 1965 prototype logged 350 flights, the latest has 12 flights so far (last October) with an Enya 60 for power.

9.) Charley believes propo radio is essential in bringing scale from a dream status to common reality, as well as making possible those first critical test flights on original highly scale models.

ILLINOIS. Few things stimulate a club greater than acquiring a flying site that allows a good degree of permanence to the club's flying activities. It stabilizes club functions as well as encouraging model building projects that might otherwise be put off. An increase in club growth and better local recognition also generally result. This is much the case with the Centerville Cadets R/C Club who recently acquired a lease on a corner of the Flying Dutchman Airport south of Belleville. Ed Gale is credited with working out the arrangement with Lorraine Bell, and in short order work was started to get the new homesite in flying shape. Clarence Golightly is the club's newly re-elected president, along with Dick Jamerson and Stan Andrews who returned for another stint at the VP and sec/treas jobs respectively. The Cadets, helped by other St. Louis area clubs, staged the successful R/C demonstrations at Scott AFB last year. Now for

*(Continued on Page 48)*

Richmond Model Flying Club member Fred Burnet and his MonoKoted P-63. Picture by Chuck Yuster shows ST 60 mounting in Micro-Avionics controlled Sterling scale beauty. 25 member club mainly flies for sport, is strong on scale and scale-like planes.

## TOP OUT

*(Continued from Page 47)*

a hard-topped landing strip on the new site. . . .

ALABAMA. Jim Whitley, Hal Coleson and Jim Edwards were 1-2-3 at the 4th Annual Gulf Coast R/C meet in Mobile. The novice event went to John Woodward with Gus Rialto and Homer Kleiser following. Ron Chidgey topped Pylon followed by Hal Coleson and Jim Edwards as the meet attracted entries from all sections of the 6 state southeastern area. Excellent local TV, radio, and newspaper coverage resulted in a good spectator turnout, Tom Barnes reports.

CALIFORNIA. While on the subject of contests, we see the MARKS of San Bernadino are planning to crank up their 2nd pylon racing meet 24-25 February. Almost blown out last year, an excellent turnout produced an exciting show anyway. Flying is scheduled to start at 10 AM at Palm Springs Municipal Airport where Goodyear and Open Pylon will be flown in conjunction with the 2nd Annual Palm Springs Police Aero Squadron Air Races. Brandon O'Brien, at 3008 N. Broodmoor Blvd., San Bernardino, is the man to contact for added details.

MICHIGAN. Word from the man from Rand, Herb Abrams, says their 3-cell, 3.6 volt, 1 amp. battery pack is available separately for GG Dual Pak users wanting an extra pack. It's also useful as a separate electric brake power source in propo installations due to the compact size despite the husky 1 amp. capacity if its new GE nickel-cadmium cells. Catalogue item 7000 is Herb's designation of this utility pack which features self-sealing vented batteries that are welded together for maximum reliability in a case complete with plug-in harness. Now, how about a 4-cell unit for propo receivers and servos, Herb?

OHIO. Larry Snedeker, of the Toledo Weak Signals, sends an announcement of the 14th Annual Toledo R/C Conference which is set for the week-end of 24-25 February. The Lucas County Recreation Hall in Maumee (8 mi. W. of Toledo) is being readied to house "the largest collection of R/C manufacturers ever assembled" where many of the new items to be marketted in 1968 may be first seen. As in the past, a Best Design competition will attract entries in Class I, II, and III as well as Scale and Goodyear. R/C boats and cars will also be seen. The popular auction and trading post will be operated again, while new movies and talks by a variety of R/C personalities will round out the Conference. The Lucas County Center is convenient to the Toledo Express Airport, the Ohio Turnpike, and several good motels. Howard Johnson's at 2450 S. Reynolds is the conference headquarters.

● The Cleveland Controlaires and the Mentor RC Club combined for a 3 day demonstration stint during the 1967 Cleveland National Air Races. This was a sort of preliminary exercise since it's hoped a regular NMPRA Goodyear meet may be held next time prior to the start of the full-size planes races each day. The Mentor club has their own field a short distance away for test flights and prelims and plans to fly the finals at the Air Races. Attendance at the 1967 affair was over 50,000 people. We hope Bob Penko keeps us posted on later developments on this enterprise.

PENNSYLVANIA. Want a kit with a WW-I flavor? Well, follow the lead of Keith Ackman of New Eagle who easily modified a standard deBolt Acrobat with a few simple alterations to give an attractive ship with an old-time atmosphere. Here's what he does:

1. Scallops the wing and tail assemblies.
2. Enlarges the fin and rudder and changes the outline.
3. Adds a pilot and a pair of machine guns.
4. Monokote decals.

Although Keith's first effort is decked out in a Central Power scheme of red with black Maltese crosses, paint and decal treatment may be altered to give an Allied Forces result as well. A Supertigre 51 powers Keith's 'original' while a Digitrio (Keith's built 2 so far) has controlled the ship very well for over 100 flights, looking "like the real thing." Of course, if something more modern is to your taste, take another look at RCM's May 1967 cover and see what Bryon Trent did with his Acrobat . . .

NEW YORK. Charlie Yuster of the Richmond Model Flying Club provides latest poop on its flying fun. The Staten Island RMFC is an old-time club dating back to the 1936 free-flight era. Its present membership stands at 25 and since neighboring clubs (Central Jersey and LIDS) emphasize contest flying, the RMFC is long on sport flying with the propo equipment most members have. Many of the members are also full-scale pilots and own a variety that includes a Super Cruiser, Cessna 150, Champion Citabria, and a Smith Miniplane. Clyde McCarthey, a club member, takes time out from duties with Sweitzer, a principal sailplane manufacturer, to ply his RC hobby. Clyde, by the way, is current national co-holder of the sailplane closed course speed record. The club's stable of well-built models reflects a preference for scale-like ships.

● Bob Clemens of 225 Susan Lane in Rochester, is a newcomer to RC and offers his impressions of what he finds:

"1. Class III pattern flying quickly becomes a bore, particularly from the spectators viewpoint (even other fliers don't watch!) 2. Models in both Class III and Goodyear look very much alike (a Thompson Trophy class is needed in racing to add character to this otherwise exciting event.)

"In this age of sophisticated and reliable RC gear, it seems something could be added to our competition to liven things up; something exciting and interesting from the spectator and fliers' standpoint. Here is my suggestion for such an event: (Bob calls it a "Performance Range event.")

1.) Shortest take-off to clear a barrier (6 to 8 ft. high).

2.) Slowest flight through a measured course, followed by.

3.) Fastest speed through the same course with scoring based upon differential with bonus to slowest speed.

4.) A limited pattern of maneuvers.

5.) Accuracy landing over a barrier and shortest roll.

Bob feels that little restriction is desired with regard to power, design, and equipment, and that the event would place a premium on development of flaps, slots, retracting gear, and other performance boosting devices and controls.

**Thinking such as Bob's is welcomed at this time because there is a growing need to evolve the pattern event to reflect equipment capabilities and to spark further innovation along performance lines. This**

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## TOP OUT

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**was one of the principal failings of the CB among its latest actions and deserves attention if we're to avoid further stagnation. There have been previous suggestions along these lines but up till now the call has not been fully understood. While there may be some who might think Bob's relative newness to RC limits the value of his opinion and suggestions, it is pointed out that extending the scope of RC utility in precision flying competition has always been a basic prob ability just waiting for the right moment to come. This suggestion merely asks again, "Isn't it about time?" We think it is — and has; although in just what detailed form the change may occur is only a matter of individual preference. It is also believed such progress is required not merely to offset such negative factors as boredom since this is often self-inflicted (almost anything may be done in lackluster way if tried — and sometimes we sure do!), but to respond to RC's growing capability, in pilots as well as in planes! The event as Bob details it is a good start to develop a natural extention of our current competition structure and could be introduced easily with minor altering of the present pattern event maneuver list. Interested? Want to help in promoting the change? Why not drop a line to Bob or this column and state your ideas or opinion? All it takes is an open mind, a moment or two, and a nickle stamp. Let's get action!**

● One of the most unusual designs ever appearing in RCM was the "Spiggen" (May, 1967) originated by Leif Thelin of Sweden as an RC version of the SAAB-37 "Viggen." Ed Berton of Sayville Long Island and the Sayville Flyers RC Club responded to the challenge and in 5 months of spare time turned out a copy that has given him, his family, and the club a lot of satisfaction in flying. Ed says he also "received a great pleasure in building the ship, it being so different." An Enya 60 with a muffler and using a 4-bladed 9 x 6 pusher prop powers the 9 lb. beauty. Take-offs are tricky due to insufficient prop area (Ed's trying hand-carved 11 x 9 2-bladed pushers which helped some) and operating from a grass strip that necessitated adding about 1½" to the landing gear to allow better prop clearance. The front winglet (a carnard-like feature) is very functional, Ed assures, being especially useful in take-offs and landings. Once airborne, the Spiggen performs well, and easily goes through its aerobatic repertoire. Spectators flock to it like bees to honey . . .

A Logictrol 5 furnishes radio control and since Ed admits to being an RC novice as yet, he shares the flying with his son Ed Jr. and two club members, Dick Aggers and Eddie Socker, both who have extensive R/C experience and incidently, are licensed pilot. Dick, as many know, heads the Autocon Corporation which markets the popular Marvelite products which includes the 1/64th inch thick 3-ply birch plywood which model builders find very effective as cover material on foam core wings.

The Spiggen was Ed's 5th RC model, being preceded by a Nordic rudder-controlled glider, a Hustler Delta, a Falcon 56, and a Kwik-Fli. Ed started RCing three years ago when his son gave him a birthday present of a single channel airplane kit and a radio. "That started the hobby all over again for me," declares Ed, who at 61 has some 30 years background as a free-flighter. Ed's start in RC brings the thought that perhaps sons lead fathers into RC more often than is the case otherwise. Although Ed doesn't tell us what happened to that first kit airplane, it's easy, to see he's successfully moved into R/C's most sophisticated realm of originals and enjoying it entirely!

● Here's an un-funny funny story Art Byers tells in WRAM to the Westchester Radio Aero Modelers: "Another club arrived at their field to find a couple kids flying a ready-built RC rig. Upset about the kids usurping their 'territorial rights' they kicked the kids off. Well, little Johnny didn't know anything about RC so he went to another field about a ¼ mile away to fly, and of course his signal shot down a full-house multi. Now that club knows better: keep the kids where they may be supervised — and think twice before acting in haste. ( — or did little Johnny know more than met the eye??!!)" Could be . . .

**INTERNATIONAL ROUNDUP**

AUSTRALIA. Sharing our masthead this month is the cocky insignia of the Cumberland RC Model Club of New South Wales. With its 73 members, a wide variety of RC interests are practiced with 20 members of this leading Australian club using propo gear in their planes. Outstanding model of the club is currently an aluminum skinned Piaggio, beautifully rendered by the scale team of Ron Steer and Ken Williams. Scaled from a Graupner single channel kit, the 78 inch gem is controlled by a 10 channel Silvertone reed set and powered by an Enya 60. It flies very well, we're told, being used in Down-under scale competitions. The club continues to operate its trainer (RCM, Sep. '67) a Goldberg Sr. Falcon housing the Australian made Silvertone 10 reed radio and powered moderately with an Enya 45. A 15 minute flight lesson goes for a low 40 cents and so far over 100 flights have been logged. Lydell Winley continues as president of the organization (terms are two years) with Pete Patsky, John Ryder, and Howard Field as the other club officials. Doug Doggett handles publicity for this active club.

VIET NAM. Lt. Col. Hank Walker reports he's spending as much time as possible to stay in practice so as to be ready for the Nats next July despite a full duty schedule and the restrictive Saigon conditions. This follows a Hawaiian sojourn for a 6 day R & R vacation which aims to make the RVN duty a little easier. It possibly makes the whole experience endurable knowing normalcy is only a few hours away . . . Hank relates he had an opportunity to visit Marine Lt. Jan Sakert in Honolulu whom we reported last month as having to be hospitalized following a glow fuel can explosion that occurred while Jan was soldering some vents on it. Hank speculates on the probabilities of this rare accident where Jan's quick thinking wife smothered the flames with a rug and possibly saved his life. Hank also condudes that pressure refuelers where soldering is only needed on the cap are perhaps best and that soldering iron are also preferable to open flame torches. On another note, the Walkers plan a San Antonio trip also this summer to visit HEMISFAIR, the 1968 World's Fair.

KOREA. Word via Army Captain Merrel Beebe regarding the Korean/American 4th Annual model meet brings news of Lou Penrod sharing top honors with Mr. Kim, the Korean champ, while Charlie Collins took 2nd in scale among the U. S. Fliers. Charlie had his neat P-51 Mustang while Lou relied on his old favorite, a ST60 powered Citrion. Scene was the Korean Air Force Academy where enthusiasm was high during this 1967 annual for the 30 odd RC entries in Class I, II, III, and Scale events. Lou, you recall, managed the winning U. S. Air Force team at the 1966 Nats and has been a top Class III contender from his usual Alabama homestead. Nice to hear ole Sarge is in practice. . . .

FRANCE. Lt. Col. Francis Plessier relays information of the "Preying Mantis" (R/CM, Sept. '66) inspiring a trio of French novelty R/C planes made to resemble delta-shaped road signs seen on the Continent and labeled "Stop," "Danger," and "Halt." They were flown at the Club des Cigognes "Storks Circus" where about 5000 spectators enjoyed a first rate R/C contest and show. Pierre Marrot (2nd at the Corsica 1967 Internats) also entertained by flying his hilarious flying wheelbarrow for the crowd. The flying road signs were fitted with a "rudder" vane having a painted on pilot's head. Mounted forward on the long canard fuselage the 'pilot' is actuated to 'look' left to give left turns and right for the right turns, all of which added to the effectiveness of the comic novelty ships. The meet also had its competition side, with a full range of pylon racing, combat, balloon bursting, limbo, and scale. We expect further details of this outstanding French meet which was held at the end of a full RC season. Col. Plessier, we might add, is a test pilot at the FAF Flight Test Center at Bretigny, and has an extensive RC fleet of his own (RCM, Nov. '67).

CANADA. Perc. Grondin, prexy of the Windsor Sun Parlor R/C Flyers, provides us with bright patter in the club's latest newsletter. Give a listen:

"I've missed Bob Forest's bulletins. In fact I made a couple inquiries to the Forest City Flyers, c/o City Jail London, Ontario . . . I haven't received a reply. Did I spell London wrong?

**"Wrote a couple letters to Cliff Weirick and haven't heard from him either. Addressed them to his business. Perhaps I should try the City Jail routine . . . Incidently, I'd like to point out to all you fellows not using PCS equipment that the "For Sale" section of our bulletin is free to members. In fact, you'll find all kinds of stuff listed that other guys are stuck with. It might be a good idea to start a "Swap" column for guys who would like to be stuck with something different for a change!**

Dave Henshaw, our editor, says I have a lot of new airplanes. Well, I've had tough luck . . . Like the time Wally Walker ran into me and smashed the ship to bits . . . He was *lucky* — my wing *just sliced his tail section off!* Then there was that time Wayne Watson came screaming out of a Split S, wiped my airplane out and then yapped at *me* for running into *him*! Now

(Continued on Page 52)


Bob Francis and Ballerina at '67 Nats.

# BUILDING THE K & K BALLERINA . . .

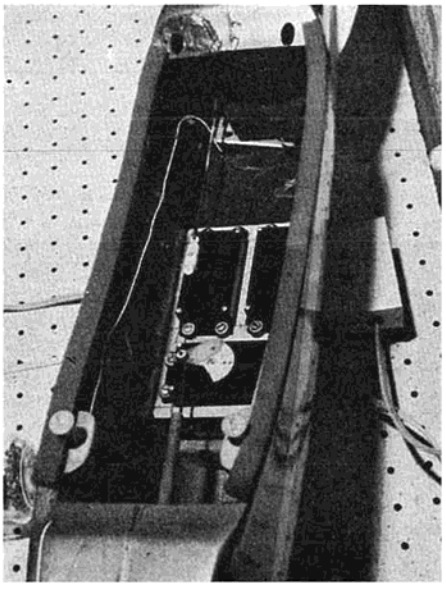
**By Bob Francis**

FOR all modelers interested in the 450 N. M. P. R. A. racing event, here is a plane just for you. This airplane has been designed for the racing beginner and yet will keep up with the best of them. It is easy to fly, very smooth and has no tendencies to tuck or snap-roll in the turns. Also, with the torsion-bar landing gear, landings are no trouble at all. This ideal airplane is the new K & K fiberglass BALLERINA. This fuselage kit comes with a joined fuselage, molded cowls and wheel pants, and all you need is your favorite polyester resin, a dab of paint and a little time.

Are you ready? Let's build her. . . .

From a piece of ¼" aircraft plywood, cut out the engine bulkhead and drill holes as indicated on the plans. Bolt a #3 Tatone mount to the bulkhead using 6-32 bolts and double nuts. Next, drill and tap the Tatone mount for 6-32 mounting hardware. Cut a hole in the right side of the fuselage just large enough to receive engine. Now slide bulkhead and Tatone mount into approximate position through the wing opening in the bottom of the fuselage. The next step is to bolt the engine to the mount, inserting the engine through the hole you have cut in the side of the fuselage. Mount a Top Flite 10-8 speed prop and a Veco or Williams Bros. 2¼" Spinner.

Using masking tape, align the spinner with the front of the fuselage, being sure to use a 1/16" spacer for spinner clearance. Run masking tape over the spinner and fuselage to hold it into position while securing the bulkhead. Cut the furnished fiberglass matte into ¾" squares. Get out your best polyester resin — we recommend Sig's. Using your finger as a tool, wet end of finger with resin, pick up fiberglass matte on end of finger, saturate with resin and place into position, joining bulkhead to fuselage. Repeat this step all around until the entire joint is covered with matte. Allow to cure. While the resin is curing, cut a piece of ⅜" x ⅜" maple to 1⅛" long. With additional resin, spot glue this maple piece to the outside of the fuselage, just over the bulkhead, and directly in line with the middle of the engine. This will be used to secure the right cheek cowl. After the spot gluing has dried, use matte and resin to secure it solidly. Now, remove prop, spinner and engine. As indicated on the plans, cut a piece of 1/16" plywood to fill in the space between the bulkhead and cheek cowl on the left side. From front of bulkhead, matte and resin into position as done previously.



Build the stab and fin as shown on the plans, cutting slots in the fuselage for same. Be sure these slots are cut exactly as shown. Use a razor saw to remove the remaining portion behind the stab cut-out. Save this piece to resin back in place after the stab and elevator have been installed. Slide the stab into the slot and resin into position. Allow to cure. Now slide the fin into the slot on the top of the fuselage and resin into position. Make left and right elevator and install elevator horn assembly. With nylon hinges, secure the elevator to the stab, putting the elevator horn inside the fuselage. Build rudder and secure to fin with nylon hinges.

Using 1/16" balsa and polyester resin, put in the pilot compartment. After the resin has cured, prime the compartment and fuselage around canopy area. (You can use any good automotive primer.) Now paint to the desired color. While this paint is drying, paint your Williams Bros. pilot and install. (R. T. V. glues him in fine.) Trim a Sig 10" canopy to fit and mark the position on top of the fuselage. Now remove all paint that will be outside of the canopy and under the canopy joint. Rough up the edge of the canopy with coarse sandpaper, and using resin, glue in place. Allow to cure. Then fillet in the canopy with automotive body putty, (I recommend Duro Spot Putty).

Seal all wood surfaces with three coats of Hobby Poxy clear paint, lightly sanding between coats. After this has thoroughly dried, spray the entire fuselage and wood surfaces with automotive primer. Using spot putty, fill in any holes or dents that may appear. Be sure to mask off the canopy before spraying primer. After the primer has dried, wet sand all the primer off the fuselage and wood surfaces using 320 wet or dry sandpaper. This is to build up all the low areas on the wood surfaces, enabling you to get a completely smooth finish. On the fiberglass fuselage, sand only enough to remove primer.

Now is the time to cover your foam-core wing. There is no need to give instructions here as I am sure you all read the R/C MODELER article on how to cover foam-core wings. After the wing is completed, seal the surfaces as done previously with Hobby Poxy clear and primer. Then sand as before.

You are now ready to paint your new airplane with Hobby Poxy finish, or whatever paint you desire.

After the paint has dried, install the engine. Put in radio, servos and push-rods as indicated on plans. After radio installation is complete, resin the tail wheel bracket into place and hook-up the elevator, rudder, and tail wheel. Install the fuel tank. Shim the tank into position with styrofoam left over from the wing-core. While installing all your radio gear, bear in mind that the C. G. on this airplane is very critical. Make sure to put everything as far forward as possible since this airplane is unstable if it

**Absent from scanning the next page**

# KITS & PIECES

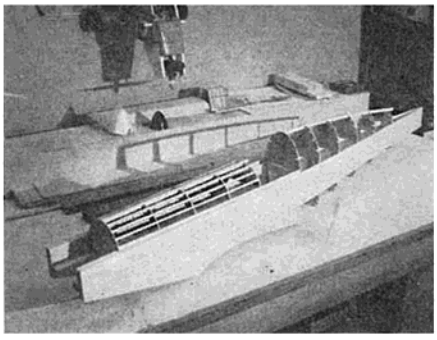
## BERNIE MURPHY

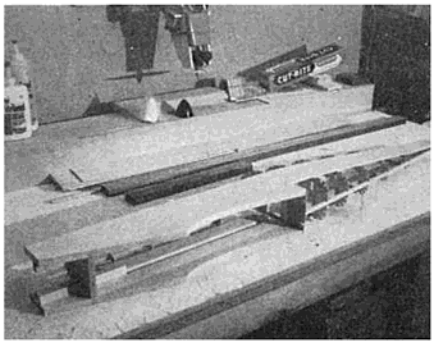
HELP! Our verbal description of the aerial movies taken from our Antic in the December '67 issue of R/CM has caused a veritable avalanche of correspondence, both by mail and by telephone. It would appear that many groups would like to reduce their refreshment costs, as we have had no less than ninety odd requests for loan of the films. Of course, each request is for a specific night, and scheduling has become an impossible task.

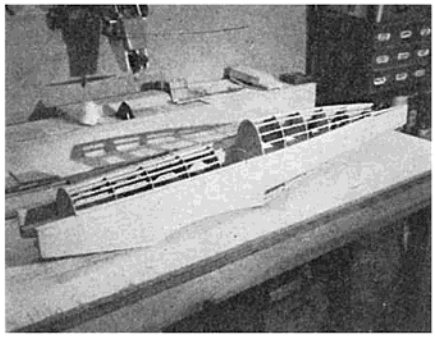
Hopefully, if we can get our hands on the original films for a few weeks, duplicates will be made, at which time, we will attempt to make them available for CLUB usage. Your assistance can simplify our task. **Please** request films on club stationery, if at all possible, specifying meeting night (first Friday, second Tuesday, etc.), thereby giving us a chance to have the films to you on meeting night, although possibly a month or two later than planned. Send your request to Bernie Murphy, 454 Gayle Drive, Linthicum, Maryland 21090. We'll do the best we possibly can. All requests should include $2 to cover postage, handling, and repair. These films are Super 8 and do require a Super 8 projector.

Due to the time spent attempting to answer the film requests, our kit production has suffered. We have, however, managed to partially complete a new Sportmaster by AAMCO. We say "new," since we have been flying a Sportmaster for two years, having been lucky enough to build and test one of the prototypes. This was our first attempt at the actual kit.

Lou Andrews, designer of the Sportmaster has again used his highly successful "Box Loc" construction on the fuselage. "Box Loc" consists of using 3/8" thick forward fuselage sides, accurately dadoed to receive the firewall, engine bearers, and bulkheads. This construction assures a true (and solid) fuselage assembly. This same structure was used on all of Lou's kits and, having built all of them, we can honestly state that it is not only quick and true, but also very tough.







After the basic box has been assembled, the rear fuselage bulkheads and cowling formers are added, followed by their associated stringers. No difficulty was encountered, and all parts fit with no adjustments necessary.

The plans are quite detailed, and the Foto-Aid sheet gives a picture of every step of construction.

In all, the construction is identical of that of the Aeromaster, with only the sizes and shapes being changed. The Sportmaster is a deluxe kit, with most of the required hardware supplied, and containing premium grade balsa throughout. A unique steerable nose gear is included which has absolutely no metal to metal contacts (also available separately at $3.95 each).

Flight characteristics of the Sportmaster reflect the effort, knowledge, and experience gained through a long series of testing of the many prototypes. As built from the kit, the Sportmaster has a 1/2 degree positive angle of attack of the wing with respect to the stab and thrust line. This combination, in conjunction with the **exact** center of gravity as shown produces an easy to fly ship, capable of steady "hands off" flight once trimmed. The addition of a 1/16" shim between the leading edge of the wing and fuselage, and shifting the CG aft 1/4" to 3/8" produces a wild machine capable of wringing out the experts — or is it the other way around?

We have flown our prototype Sportmaster under just about every condition imaginable, and under various trim setups. It is a "capable" machine. Although not what we would classify a beginner's ship, the Sportmaster, trimmed as shown on the plans, should delight anyone capable of flying the average Class III "type" airplane. This ship is also a natural on floats (Feb. '67 R/CM), since there is nothing open to collect water, except for the cockpit, which is easily closed with a floor or DuBro canopy. Handling characteristics on floats are excellent, both on the water and in the air. At your local hobby shop.

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VK Model Aircraft, manufacturers of the popular Cherokee and Navajo kits, have announced their forthcoming two inch scale Nieuport 17. This is a first for VK — a truly scale ship. It is anticipated that the kit will be ultra complete with guns, fittings, and hardware. Construction is largely of spruce for added strength. We have conferred long and often with Vern Krehbiel during the preliminary design stages of the Nieuport, and are excited with the prototype results. Available in about a month at a price as yet undetermined.

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For the scale buff, the Smithsonian Institution has available a number of pre WW II scale drawings. These are available at $1 per sheet (some ships have 2-4 sheets), including postage and mailing tube. The drawings are designed for modelers, and show three-view, general arrangement and dimensional sections, as well as technical and historical notes. A complete listing is available from Fiscal Division, Section M, Smithsonian Institution, Washington, D. C. 20560. Checks for orders should be made payable to the Smithsonian Institution. Some of the WWI types are listed below:

Nieuport II, 1915, 3/4" to 1', 1 sheet; Nieuport 28, 1917-18, 3/4" to 1', 1 sheet; Albatros C-5, 1916-17, 1/2" to 1', 1 sheet; Fokker EIII, 1915, 3/8" to 1', 1 sheet; Fokker D VII, 1918, 3/4" to 1', 4 sheets; Fokker DR I, 1918, 3/4" to 1', 2 sheets; Rumpler RU-DI, 1918, 3/4" to 1', 2 sheets.

These are excellent drawings — a must for every scale fan's files.

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The Heathkit version of the popular Kraft proportional system is about ready for shipment to those who placed early reservations. With the Heath Company's capable instruction writers and years of kit packaging experience, do-it-yourself R/C should successfully reach to the uninitiated, average modeler.

The arrival of the Heath Co. into the R/C field comes as a pleasant surprise to many. In some "small" sense it is a return to at least one form of the company's beginning — **aviation.** Ever hear of the HEATH PARASOL? That was the first HEATH-KIT!

The following account of the "Story of Heath" we pass along from their catalog:

"When Edward Bayard Heath founded the Heath Aeroplane Company during the early 1900's, little did he realize what would eventually evolve from his small "airplane trading post" as it was commonly called. Before he died, Mr. Heath was able to see the fruition of his early dreams. In 1926, he produced an airplane in kit form — the famous Heath "Parasol." For years

this light aircraft was a favorite in the flying fraternity. Mr. Heath was killed during a test flight in 1931, marking a tragic end to a brilliant career. From that point through WW II, the Heath Company remained in the aircraft and replacement part business.

But it wasn't until shortly after WW II, that the character of the Heath Company changed. It was then that an ambitious engineer named Howard Anthony, who had purchased the Heath Company in 1935, took a calculated gamble. The ingenious Mr. Anthony bought a large stock of surplus wartime electronic parts, designed and "mail order marketed" an oscilloscope for $39.50.

Mr. Anthony based the success of his idea on the premise that anyone, regardless of technical knowledge or skills could assemble a kit himself, and save up to 50% over comparable factory-built models. All that would be required were a few simple hand tools and some spare time.

Orders poured in for the oscilloscope kit, and the foundation for the Heath Company as it exists today was established. Mr. Anthony expanded his test instrument line and soon added amateur radio and hi-fi component kits.

The key to the kit-builder's, and consequently Mr. Anthony's success was the instruction manual. Its contents still guide the Heath Company today. It contains simple, non-technical instructions and large "exploded" diagrams that take the builder through each and every step. . . . show him exactly what to do and how to do it. Proof that every Heathkit is designed to be "beginner-built" can be found in the cards and letters Heath receives daily from people of all ages and all walks of life, expressing their delight and satisfaction.

Tragedy struck again in 1954 when Howard Anthony was also killed in an airplane crash. Daystrom, Inc. then acquired the Heath Company. In 1962 Daystrom, Inc. was purchased by Schlumberger Ltd., a leader in the development of electronic techniques for oil exploration.

Since 1954, more kit products have been added until at present Heath boasts 11 different product lines, consisting of over 300 kits . . . the world's largest selection. Whatever your interest, you'll find a kit to match it.

In order to produce the vast array of Heathkit equipment a modern 205,000 sq. ft. plant was constructed in 1958 on the shores of Lake Michigan in St. Joseph, Michigan. And recently another 156,000 sq. ft. of engineering and manufacturing facilities were added, bringing the total space to 461,000 sq. ft."

So you see, Aviation and Aircraft have in one way or another affected the Heath Company since its beginning. In one step, Heath has become both the oldest and newest firm in the R/C industry.

We welcome them.

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Don't forget the Annual Toledo Conference, February 24-25 at the Lucas County Recreation Center in Maumee, Ohio. This is your chance to see the very latest in kits and equipment. Thousands show up every year — most of them return visitors. We'll be there . . . shouldn't you?

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Anyone for R/C iceboats?

## TOP OUT

*(Continued from Page* **49***)*

everytime I hear an engine lean out in a dive I start looking for the abort button . . . It's a good thing I can't start my engine. If I ever stood up . . .

"I've just been flying with Wally Walker and Lou Favero — I'm trying to talk them into making full bore passes *under* their transmitters. I figure if they goof *just a little* they won't be back 'til next season . . . older, wiser, and still a little sore around the middle!

**FLASH — Just received a lengthy letter from Cliff Weirick complete with his personal autograph! How 'bout that? These bulletins get fast action, don't they?"**

Thanks, Perc, now we're all a little older, wiser . . .


**Savannach VG**

**Savannach VG**

**Savannach TM**

**Savannach TM**

**Savannach ADV**

**Savannach ADV**

**Savannach Bingo**

**Savannach Bingo**