

7TH ANNUAL RC MODELER MAGAZINE WINTER NATIONALS



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MARCH 1975

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radio control MODELER

THE WORLD'S LEADING PUBLICATION FOR THE RADIO CONTROL ENTHUSIAST

LEARNING TO FLY THE R/C HELICOPTER
FLIGHT TRAINING SEMINAR



BF-109E

SCALE-LIKE GERMAN FIGHTER

SUN RAY

UNIQUE SPORT AND PATTERN BIPE

TIGER MOTH

.020 POWERED SCHOOLYARD TIGER

R/C MODELER

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THIS MONTH'S COVER

What model aviation is all about --- the expression on Dave Mitchell's face tells it all as he holds his father's Tiger Moth. .020 powered Schoolyard Moth featured in this issue. Ektachrome transparency by Bill Bell.

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VOLUME 12 NUMBER 3
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1975

FROM

DON DEWEY



THE SHOP

● The following letter from John Worth, Executive Director of the Academy of Model Aeronautics was received on December 16th, 1974, and is being presented in this issue as a follow-up to the article entitled "There We Were In Court" by Dr. Dave Schwartz:

Dear Don,

Dr. Dave Schwartz's letter in January RCM has some valuable information for those concerned with getting and keeping flying sites. It's unfortunate, however, that his complaint about AMA's assistance in the Detroit club case may mislead rather than inform — the situation was not quite as reported and the difference is important. Too bad that the correct information was not included at the same time as the January article, instead of now — months later — but maybe it's not too late.

When the Detroit group asked for help while an injunction that halted flying on their club-owned field was awaiting trial, AMA Headquarters was told that the problem was NOISE. AMA's booklet, "Memorandum of Law on Modeler Noise Complaints," covering the legal aspects of noise problems, was sent along with some legal advice from AMA's General Counsel. All information from AMA was directed toward the problem of noise. Had we known then that the real question was trespassing (flying over someone else's property) other legal advice regarding this would have been provided; although there's little defense for such a situation.

The basic problem in Detroit was apparently caused by an unthinking competitor at the club's contest which culminated in a charge of trespassing — in the airspace and groundspace of neighboring landowners around the club's field. The problem of trespassing — whether in flying or in the retrieval of downed aircraft — is beyond the control of any group or individual outside the local club. But in seeking help from the AMA the club did not focus on the trespassing problem. So it's only natural that AMA's advice, which was based on an assumption that noise was the problem, would not be very helpful.

Compounding understanding of the Detroit problem, Dr. Schwartz complains that AMA has not made a strong stand for mufflers. True enough, but that's not the

whole story. The fact is that AMA must represent all its members and, as yet, too many of them oppose muffler requirements or legislation. Although the noise problem is worsening and the tide is turning in favor of muffler seekers, there are apparently still too many members who can fly in the wide open spaces and who contend that there's no need for mufflers. Urban modelers, on the other hand, obviously need mufflers and all the help they can get in fighting the noise problem.

So, two voices are heard by the AMA Executive Council and so far, the voices of members who find no need for mufflers seem to be the loudest. Many AMA officers recall what happened in England when a national muffler rule for models was enacted, only to be rescinded a couple of years later in answer to modeler demands.

AMA is trying to find a middle ground, encouraging, without requiring, the use of mufflers. But the basic problem is a lack of truly effective mufflers. They're improving but still have a long way to go. AMA legislation cannot do much to change the picture because it can only affect the competition flier — that's the only area where AMA has a direct rule making authority. And the competition fliers number a small fraction of the whole. Most of AMA's members are Sunday fun fly types and AMA has no control over their activities — that's a matter for such government agencies as the FAA, the FCC, and the EPA.

Dr. Schwartz highlights the problem himself. I quote from the January article: "We carefully studied their (AMA's) 'Memorandum of Law' both before we bought our land and after our lawsuit. Not only was it useless, it was misleading. There is not a word in it about fly-over rights and trespass laws (AMA note: of course not — it's a memorandum about NOISE complaints!). The lawyer who helped us buy the land is not a modeler, and it never occurred to him that we might stray beyond our property."

According to a report by Jack Josaitis, AMA's district Vice-President for the Detroit area, the situation there now is that the local court has ruled that the club has a right to fly over its own field but not over adjacent property. And we hear that the club is now trying to rent the airspace over such property in a direction where the

neighbors are friendlier.

In the meantime there's a lesson in this for all of us: be sure you know the real problem before you try to solve it.

Sincerely,
John Worth
EXECUTIVE DIRECTOR

And just about the same time as we received the letter from John Worth, we received the following from Dr. David Schwartz, the author of the article:

As promised, and hopefully before press deadlines, here is the conclusion to "There We Were In Court."

We have agreed to the hearing judges ruling and neither we, nor the plaintiff, will appeal to a higher court. The terms of agreement are that we can continue to fly, but with the following restrictions:

Between the hours of 10:00 A.M. and 8:00 P.M. during May, June, July, August, September; and 10:00 A.M. to 1/2 hour before sunset the rest of the year.

Most importantly, we cannot over-fly the neighbors property. The neighbor on one side of us refused to give us his air rights and, in particular, he would not sign any form of lease to that effect. He did finally agree that he would not stand on the fence to hang us if we crossed over by a foot, but he reserved the right to ground us if we began flying too close to his house or otherwise abusing his good will.

A second neighbor did give us permission to over-fly his field so long as we made good on any crop damage. Fortunately, this one most friendly neighbor lies in the direction of our landing approach.

So we are flying again — as long as we mind our manners we'll probably be all right. But it sure would have been a lot easier if we'd minded our manners last spring!

Now — if we only had really quiet mufflers!

David J. Schwartz, D.D.S.

★

While we are going through the mail bag, Dave Loreen of Crystal Systems Inc., in Chardon, Ohio advises us that the solvent for alpha cyanoacrylate adhesives such as Hot Stuff, Super Glue, et al is DiMethyl

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An Open Letter To The Model Press

BY DON DEWEY

Freedom of speech and editorial freedom of the press are fundamental and inalienable American rights.

But the founders of this country who drafted the articles of the Constitution and the Bill of Rights that guarantee us those freedoms, fully intended their use to be tempered and balanced with responsibility.

The rancid and vitriolic diatribes which have poured forth from the editorial columns of some members of the model press during the past few months not only exceed the bounds of journalistic license but negate the very concepts of editorial liberty and the boundaries of editorial criticism. We are referring to the editorial attacks on the Academy of Model Aeronautics in general and the 1974 Lake Charles Nationals and the Masters Tournament in Hutchinson, Kansas specifically.

There is a great difference between negative and positive action as well as between negative and positive criticism. In years past we have been openly critical of some of the actions of the Academy of Model Aeronautics. However, prior to any editorial we expressed our opinions privately to the individuals involved and attempted to work out alternate solutions to the problems. If this failed, we then editorially commented on the problem and, again, offered an alternative to the existing solution with which we may have been in disagreement. However, to attack the people in the city of Lake Charles, Louisiana for problems arising out of the 1974 Nationals, or to blame the Academy of Model Aeronautics for the wind at Hutchinson, Kansas is not only ridiculous and irresponsible but, in our opinion, an insult to the readers intelligence — the latter asset seemingly totally lacking on the part of the authors.

To begin with, the staff of R/C Modeler Magazine extends its apologies to Mayor William E. Boyer of the City of Lake Charles, Louisiana for comments which recently appeared in the model press. It is our hope that with these apologies he will understand that the entire model industry does not share the feelings of that writer and that we express, with our regrets over that unfortunate editorial, our appreciation to the officials and people of Lake Charles for their kindness and friendship as hosts for the Nationals.

To be certain, the Nationals, or any event approaching such magnitude, incurs many problems along the way. And, however you may have viewed the 1974 AMA Nationals, it was the end result of a great many volunteers working as hard as they could under circumstances over which they had little control. And, they were fully aware of the problems before the self-serving editorial in question ever was written — in fact they were already at work to eliminate those problems and improve conditions for the 1975 Lake Charles Nationals. To this end, they are still volunteering their efforts despite the editorial irresponsibility and rancor which would cause individuals of lesser stature to say "who needs it," and quit working towards their common goal.

At a point in time when our nation is faced with one crisis after another — with the inflated dollar, recession, and unemployment sharing the headlines with energy shortages and national and international disputes, it is easy to fall into a pattern of negativism. What we **don't** want, or need, in this hobby and sport is a carry over of that negative attitude. And it is of great credit to the Academy of Model Aeronautics that the entire tone of their actions are **positive**. Currently, the AMA has over 50,000 members and has truly established itself as one of the most dynamic and progressive organizations in all the world of sports and aviation. Speaking as a long time Leader Member of the Academy, I am truly proud of the dynamic accomplishments of our President, John Clemens, and the entire Executive Council. Our own District X Vice President, here in California, Alex Chisholm, has put forth a tremendous effort to find

out the needs and desires of the rank and file member of the Academy and to communicate those desires to the rest of the Council. He has expended untold effort towards accomplishing the goals that the members wish to achieve, and he has done this at the expense of his own time and health and without recompense. This holds true for each and every district officer.

As John Clemens stated, "positiveness is the realization that something can be improved — and the daring to try!" All of the Academy's leaders believe deeply in this philosophy for, if they didn't, they would not continue to volunteer their services. For each of them is a business man with all of the trials and tribulations that each and every one of us experience in our own daily lives and who are putting forth that extra bit of effort in order that each of us may enjoy this sport and hobby just a little bit more. In the light of the recent criticism of their efforts, it is amazing that they continue to expend that effort on our behalf for they gain nothing from it personally except the knowledge that they have contributed to the over-all advancement of model aviation.

John Clemens, Alex Chisholm and the rest of the members of the Executive Council are bigger men than I am — I am not sure that under the brunt and added burden of the pathetic attempt by an amateur writer to tear down someone else in order to build up his own image, I would not be tempted to simply go out and enjoy the sport of flying my own aircraft rather than expend the free time I had toward the betterment of the hobby for the rest of the members of the Academy.

All of the members of the Academy of Model Aeronautics, with the exception of a small handful of paid professionals who work at AMA headquarters, volunteer their time and efforts on our behalf. It begins at the top with the President of the Academy, the Secretary / Treasurer, and the 11 District Vice Presidents who steer the actions of the Academy based on the wishes of the members. In addition to the Executive Council, are the Contest Board members from each District of the Academy and the hundreds of Contest Directors from across the country. Each of them is contributing their time and efforts towards a positive organization that will make this sport and hobby more enjoyable for each and every one of us, enlighten the general public as to the benefits of the sport, and to act on our behalf at the highest levels when we have problems with air space, frequencies, legal disputes, and organizational problems.

And, as John Clemens points out, if you want evidence of more positive action consider the club officers, program directors, site providers, sponsors, donors and the like. And you can add to that list the unsung heroes, the newsletter editors of the many clubs across the country who keep each and every one of us informed as to the activities and desires of their individual organizations.

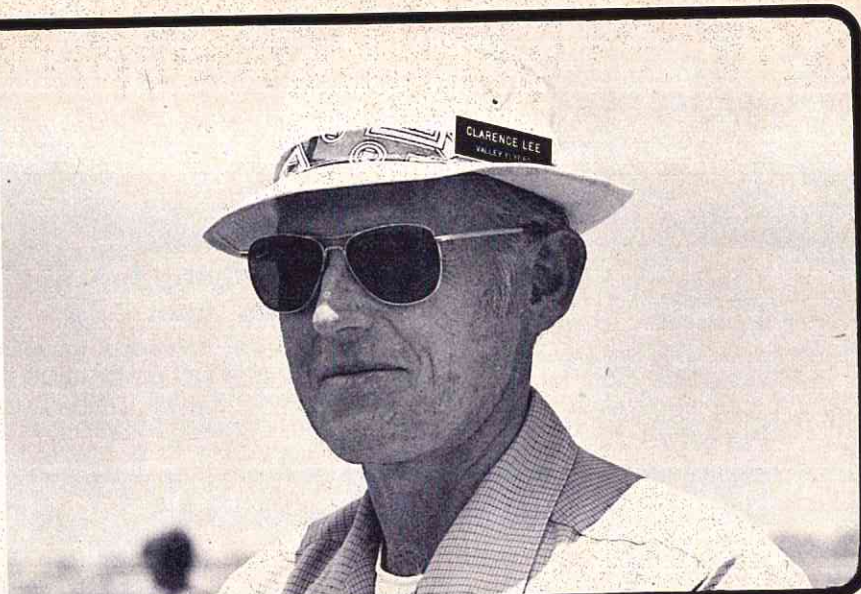
And last, but most important of all is the individual member of the Academy. That, my friend, is you — for you are the individual who pays your dues and finances the entire organization and, in the long run, makes possible every benefit that we enjoy in our sport. Your contribution of dues and whatever time you can afford to spend toward helping the Academy, at whatever level possible, backs up your belief in this positive action.

In any organization the size of the Academy of Model Aeronautics, which serves as a governing body for a sport as large as that of model aviation, there are bound to be problems, whether it be at a contest the size and magnitude of the Nationals or on a purely administrative level. And, as a member of the press, we would be the last to deny anyone the right of editorial freedom concerning those problems. But we also feel that being negative without offering an alternative

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engine clinic

By
Clarence
Lee



Dear Clarence,

I wonder if you would clarify the following query for me: I have been following RCM since its first issue. Since as far back as I can remember, you, in your column, have specified that the centerline of the fuel tank should be no higher, and preferably 1/4" - 3/8" below, the centerline of the carburetor. Now, I go along with this, make every effort to achieve this set-up, and have had very few problems from this aspect.

Now, on checking through a number of back issues of RCM, I find that about 50% of the models shown in your construction articles have the tank c/l anywhere from 1/4" - 1/2" above the carburetor c/l (two notable contest designs being "Miss Norway" and "Belaire").

The question, then, is - is the tank position all that critical? I cannot believe that the designs of airplanes participating in World Champs would have a high tank placement if it was going to jeopardize their engine run! The reason for my query is that with retract gear, it becomes difficult to achieve a low tank position. (Obviously the case with Miss Norway.) I find kits, even with fixed ulc, seem to be really haphazard in tank placement - maybe you could include comments on things like this in your reviews.

I would really appreciate your comments on the above. Thanks for a really fine magazine.

Yours very truly,
Jim Anderson,
Hamilton, Bermuda

Tank position is quite critical and for best performance the center line of the tank should never be any higher than the center line of the needle valve. Ideally it is better to have the center line of the tank slightly below the needle valve - 1/4" to 3/8". This eliminates a little of the initial fuel head and gravity feed that loads the engine up on idle with a full tank. To place the tank with the center line above the needle valve means

that, during inverted maneuvers, the tank is low which, in turn, results in the engine leaning out at the bottom of outside loops, Cuban Eights, etc. By having the tank 1/4" - 3/8" low in the upright position this becomes slightly high during the inverted maneuvers and will richen the engine slightly which is far more desirable.

As far as many designs showing the tank in a high position - this was simply a sacrifice that had to be done in order to use a retracting nose gear. Also the reason many fellows are using nose wheels of very small diameter - actually out of scale with the

rest of the model, so that the fuel tank can be positioned with the center line closer to the needle valve level.

Many of your competition fliers are now using in-flight mixture control so that they can adjust the mixture during the course of a flight. Also the use of muffler pressure has helped to keep a more constant needle setting making tank position a little less critical.

I agree that many of your kits with fixed landing gears seem to have the tank placement rather haphazard, in most instances however too low. This comes from many designers having more design knowledge than engine knowledge.

Dear Clarence:

Enjoy your "Engine Clinic" in RC Modeler, reading it first of all. I have a couple of questions and a couple of opinions for you.

Back in 1938-39 when I was in Oregon, I was the proud owner of a Husky Jr 19. Do you have any history on it?

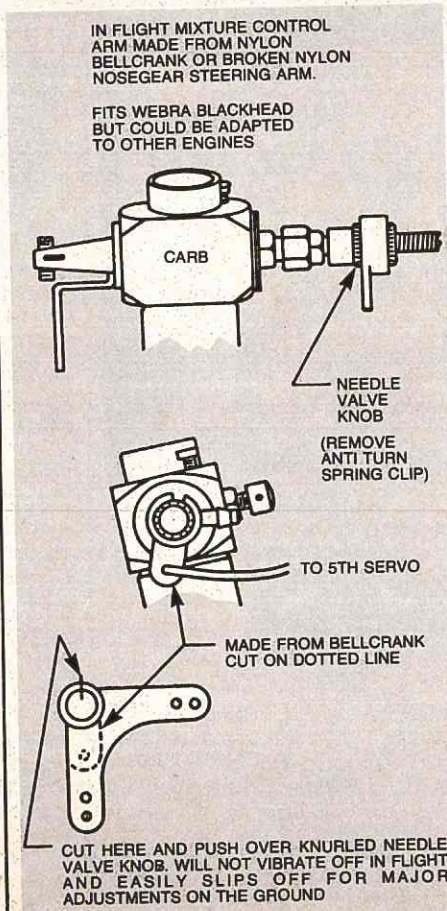
Another question which has been on my mind for sometime is whether or not, in your opinion, the McCoy and Doolings of a few years ago compare with the engines now available for RC use.

The first opinion I would like to express is related to the letter by Nathan M. Mayo, September RC Modeler, and the Muff-L-Aire. My experience and a couple of others here is that it causes the engines to run hot.

The other is one blade vs two bladed props. I agree the one blade is harder to balance dynamically but after flying a few on control line speed jobs back in the 40's I'm convinced they are better. Their lack of popularity probably has some relation to the fact that AMA rules do not allow their use.

Sincerely,
Brayton B. Paul
Marietta, Ga. 30062

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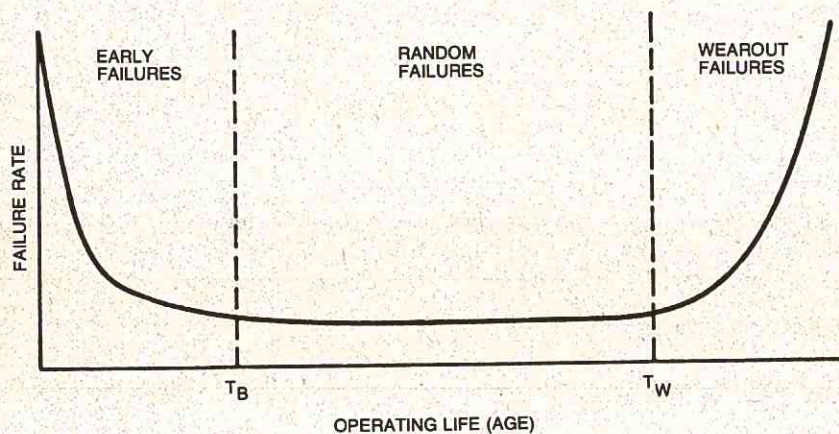


FIGURE 1

Well, the mail is really starting to come in as a result of our first column in the December issue. I'd like to thank all of you for your kind words and hope I can live up to your expectations. I have had only one complaint letter from an individual who didn't think the expanded scale voltmeter is of any use. The interesting thing is, he may be right — for the type of batteries he uses.

This brings up a subject I'd like to dwell on for a few moments. I've been involved in R/C for twenty years but this doesn't mean I've seen every battery that's been used in that time. I shouldn't have inferred that all nickel cadmium batteries have a characteristic curve exactly like the one that was published. I doubt that someone has cells with a perfectly flat discharge characteristic, but if he does, that's a horse on him. I would compare his problem to someone taking off in a plane across country without a gas gauge or reserve tank. It could be done by watching the clock but it would be a little risky. Anyway, there was enough interest, so next month we'll talk about the expanded scale voltmeter in detail.

Our subject for this month, that everyone

knows all about already, was brought up by Joe Recesso of Manchester, Conn. Joe is taking exception to the statement made in RCM (and in many ads) that R/C proportional equipment has reached a high degree of reliability. Joe's letter describes problems he's experienced with three

well-known brands of R/C equipment. Before we decide whether Joe has a unique problem let's take a look at "reliability."

Reliability is a critical variable because it has a significant impact on:

- (1) **Flight Safety:** A catastrophic failure

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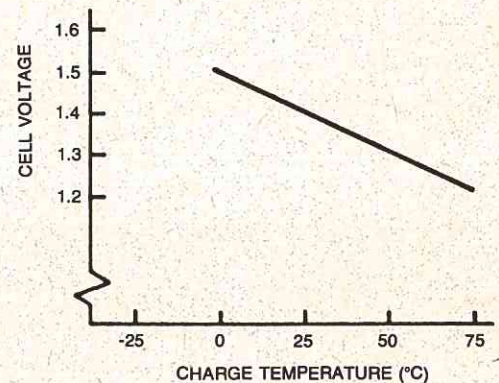


FIGURE 2
APPROXIMATE CELL VOLTAGE
VS. CHARGE TEMPERATURE

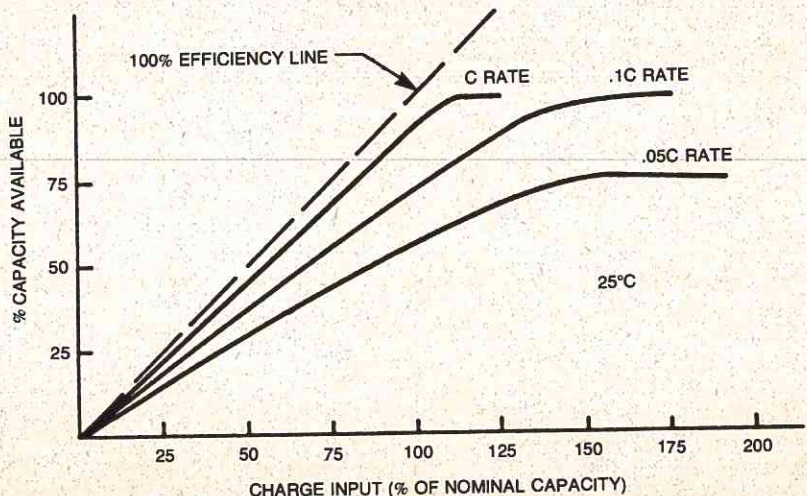
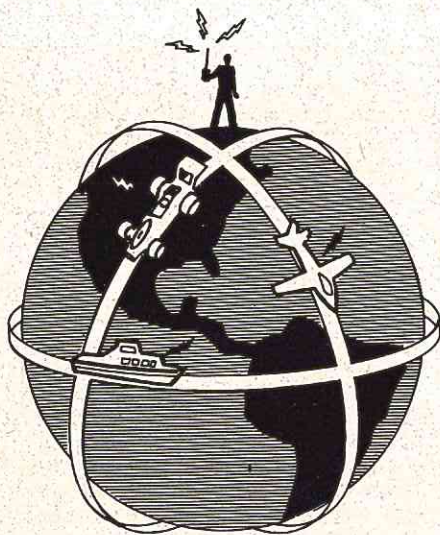


FIGURE 3

EXPO



'75 EXPORTATIONS

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CUNNINGHAM ON R/C

BY CHUCK CUNNINGHAM

● Did you ever stop to wonder why some sports or hobbies seem to take off in popularity, while others seem to lag along at about the same rate?

Naturally, the influence of television has had a great impact on most of the sporting activities around the country. The mushrooming boom in tennis is directly related to the ever increasing exposure on TV. Pro football received, and is still getting, a big plus from TV, and look at the prize money in professional golf — astronomical, all due to television exposure.

Another thing that makes for a boom in a hobby or sport is the ease of entry into it. Today, motorbike riding is tremendously popular, with more and more people racing in events every weekend. It's easy to get into, and an easy sport in which to compete.

Anyone can bowl. Maybe not well, but anyone can toss a ball down a bowling alley. But how about our own hobby/sport? We didn't start to grow until our radio equipment became so reliable that we could get flight after flight with no cries of "I ain't got it!" I feel that we are still on the threshold of terrific growth in the years to come. More and more people are entering the hobby, and sticking with it. Just the vast numbers who have tried out sailplane flying in 1974 are testimony to this.

Now, is all-out growth a good thing? Perhaps you're thinking that you like things the way they are now, and wouldn't really care to see your flying field get more and more crowded. I can assure you that the flying fields today are much more populated than they were ten years ago. But, the equipment is much much better than it was a decade ago — more reliable, smaller, and less expensive. This would not have happened without the growth of our hobby, because it is **demand** that makes for performance. Therefore, the purpose of this bit of wandering is to assure you that growth is good for the sport of R/C flying, and for the hobby of R/C building.

Since it has been somewhat difficult in the past to get good TV exposure for our interests (not one photographer in a hundred can make a good flying movie of R/C) it is to all of our interests to present R/C flying to the general public whenever we can, and in the best possible way.

Why not, then, take some **positive** action for 1975 and get your club to forming a really good demonstration team. There are many ways that R/C can be exposed to the public, and what better way than through a really good thirty minute air show? All too often the local club is asked to put on a demonstration in conjunction with some event and, all too often, the demonstration consists of a few fliers taking off and jacking around the sky for a few minutes,

and then landing. Why not really get your heads together and work out a real presentation, with opening numbers, or a fly-by, then aerobatic demonstrations, formation flying, scale flying, bomb dropping, mock combat, and then a finale. If you give some thought to it, you can really come up with a great show, and the exposure will be more than you have realized. I have never yet met someone who was viewing R/C for the first time who was not simply amazed. It has great spectator appeal, and, who knows, someday perhaps you will be the R/C pro who takes home the TV prize money for the year.

★ ★

This past year, as many of you long time readers know, I moved from the house and workshop that I had been living in for the past seventeen years to an old home that my wife and I (with minimal help from our teenage children) have been remodeling. One of the bad features is that my workshop is now in a room in the detached garage, a trip of some forty feet through rain or snow or what have you, to almost total isolation, except for my dog who shares my workshop as her bedroom. This is not too conducive for much building, or designing, or much of anything, so I have been attempting to persuade my wife to let me set up a small work area in our bedroom. This she finally consented to but, in order to keep things reasonably neat, I am confining my work in this area to only building and designing. No covering, except with plastic films, no sanding, and be darn careful not to spill glue on the carpet! I decided to build a work table which would give me a compact building area, and yet allow me many of the comforts of a large work area. It worked out very well, so I thought that I would pass along to you the basic design of the work space in case you are faced with a similar problem.

The work surface is a 30" x 6'8" door, picked up from a lumber yard. One face of the door had been damaged so I was able to purchase it for a couple of bucks — a substantial savings over the regular price. Next, I built a table to support the door. I like to work standing up, so I built the table so that the top of the working surface would be 38" above the floor. This can, of course, vary to suit your own height. Use the kitchen counter to experiment with to see what height is most comfortable for you. I used 2" x 4" lumber to build the frame of the table, and for the legs, with cross bracing at the rear only for stability. Between the legs on each end I installed shelves 12" apart, and two shelves that run along under the table for the full length. The top of the table overhangs the base by a foot on each end and two inches on the front and back. At the rear of the table, and above the

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Bf-109t

BY
CARL
LONGFELLOW

● Have you ever been so moved by something that it gives you "goose bumps"? Like the lines of an outstanding classic car or a good piece of music?

Well, the looks of WW II German Fighter planes do that to me. They all just seem to have the lines that I like. For this reason I have been thinking about RC'ing the ones I like best. And, what else do you start with but the BF-109E? There is one big problem that keeps giving me trouble: I'm not a good enough flier for true scale, but I am far enough along to be tired of trainer types, which I don't think look like airplanes. I keep asking myself "Why can't I come up with a design that looks real, but is still relatively gentle to fly"? I know it's been tried many times before, but I just had to give it a try. It seems that I debated with myself for months about going ahead with the project. During this time I even looked for a kit, but, of course, there isn't much available in Stand-Off Scale for a .40 to .45 engine.

At about this point in time I picked up the current R/C Modeler; low and behold two stand-offs; a 109E and a Tony, both on the same plan by Danny Reiss. This gave me the boost I needed. Although Mr. Reiss' plans were close, they were not just what I

wanted. I broke out the drafting table and went to work on some plans of my own. Using the old "rules of thumb": length — 75% of span; nose moment — 20% of length; and tail moment — 40% of length. I kept juggling these figures until I got the "look" I was after. A "reasonable facsimile" of the real thing.

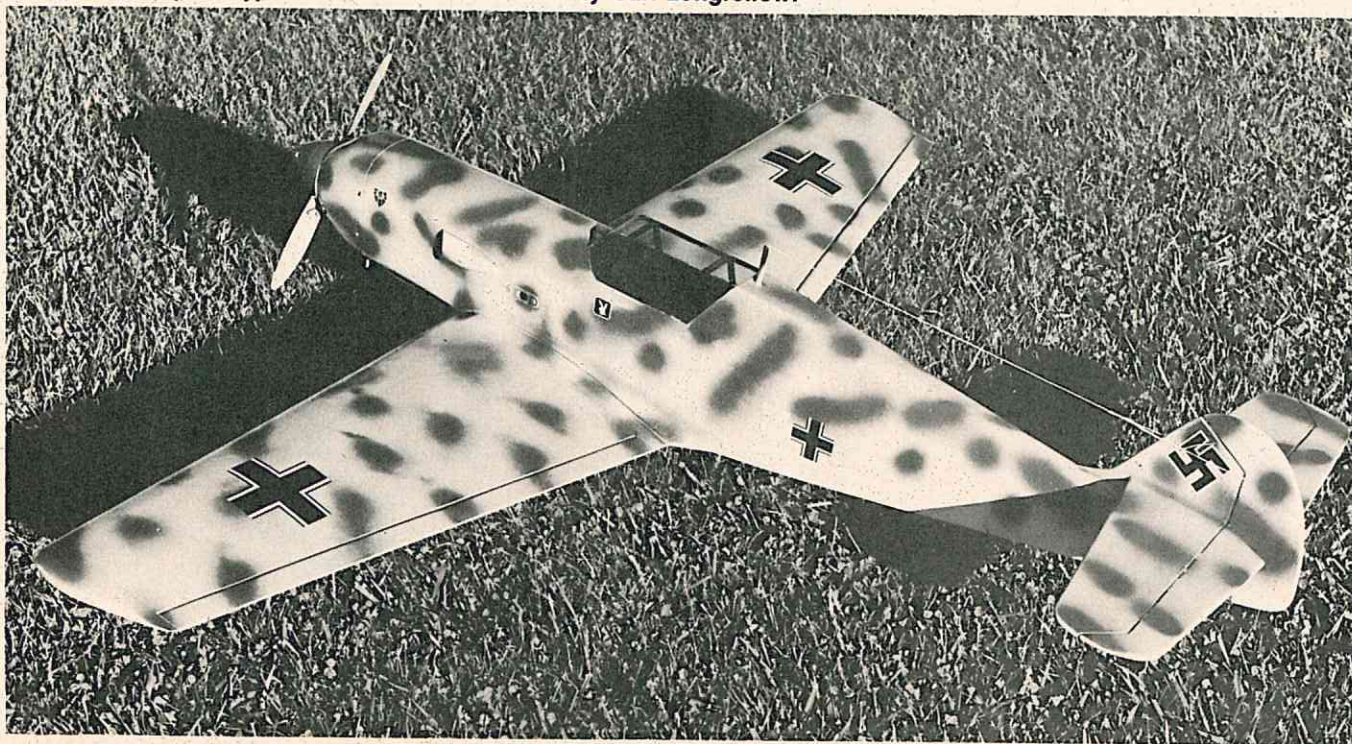
Before I go any farther, I think I should explain something I'm sure you're thinking by now, "What's with this guy, first he says he's not a good flier, now he's designing a scale model!" What goes? Well, I have been designing, building, and flying models, off and on for over thirty years, but I just never got around to R/C until about three years ago. Now I've really got the bug! Okay, back to the 109.

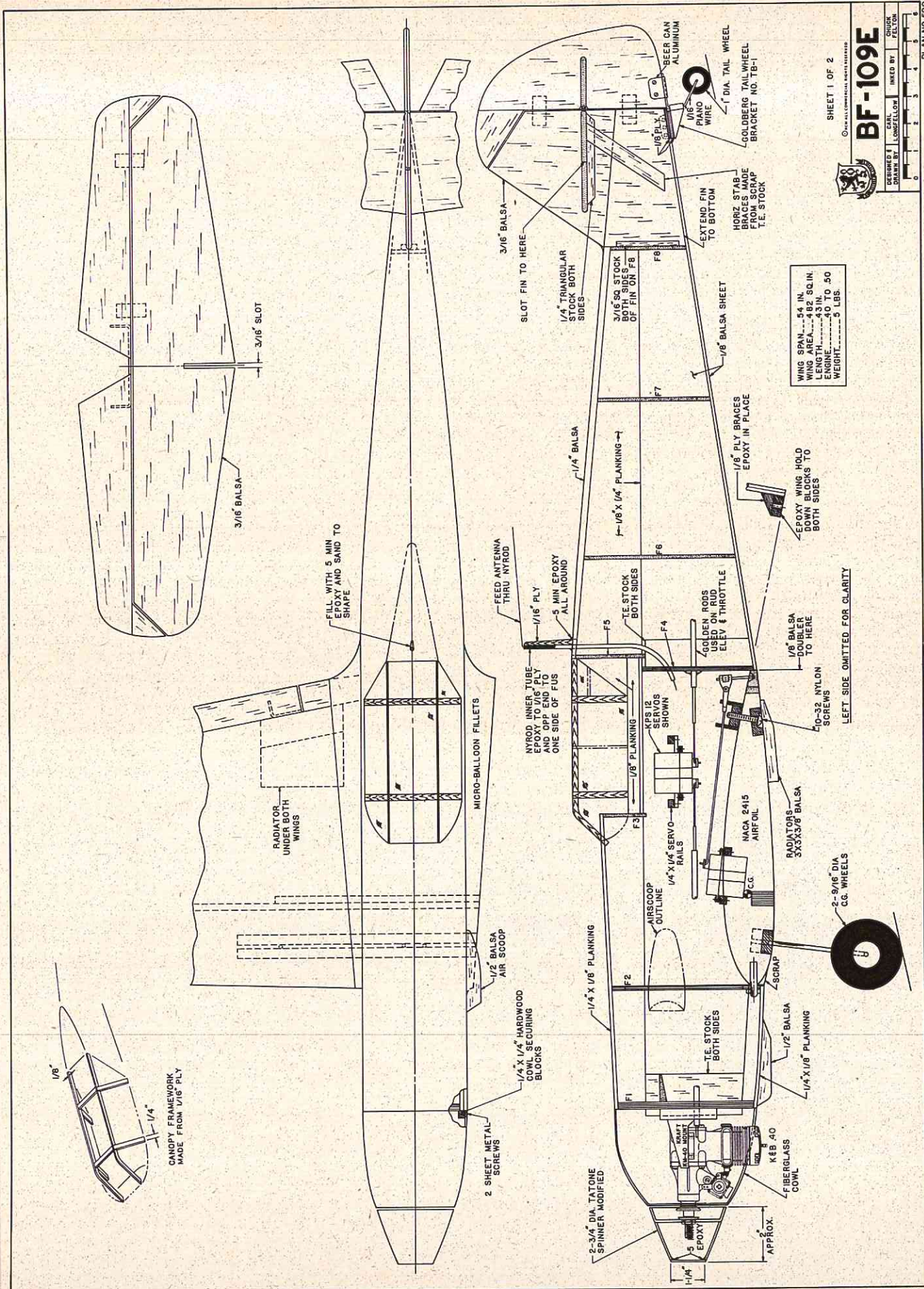
After arriving at the moments I wanted, the rest was easy. Since I hate to build wings, I decided on a foam core. I did stick with the old standard, "balsa and rags (silk)" for the rest of the construction. Since I scratch build most all of my models, I have developed a routine. It starts by transferring all the piece parts to the balsa sheets, and cutting them all out. If you make all the pieces you're going to need for the complete model right away you'll find the rest of the construction goes along just like a kit.

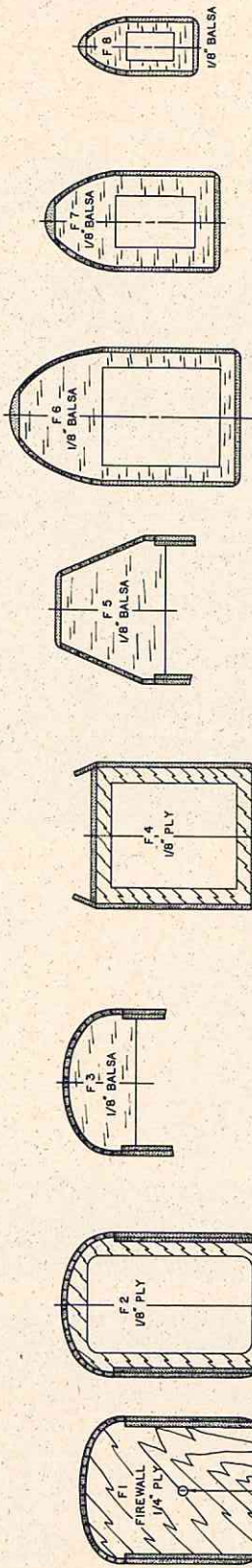
CONSTRUCTION

Starting with the fuselage, install the doublers as shown. Making sure both sides are lined up, clamp the aft ends together, but do not glue. Install the firewall F-1 and bulkhead F-4. I use 5 minute epoxy here. After these are set, install all bulkheads except F-8. Making sure they are centered, add the fin alignment blocks to the aft side of F-8. Now, position on the front of the fin and install both in the fuselage. As you will notice, this is a self aligning assembly, so a little care at this point will save lots of headaches later. The planking on the bottom front should be done first. This area, being for the fuel tank, should be sealed well. I used fiberglass cloth and polyester resin. Now the rest of the fuselage construction can be done in any order. The inside of the top front can be sealed through the wing opening. In fact, I coated the entire inside back to bulkhead F-4. Now install the horizontal stab, and don't forget the triangular pieces on the bottom sides. Rough sand the whole thing to shape. Make up the canopy framework and install as per plans. Now this area should be finish painted and a pilot installed if you desire. I was not able to buy a WW II German pilot, so I "faked" one out of an American jet

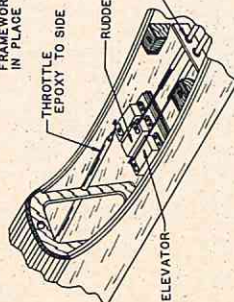
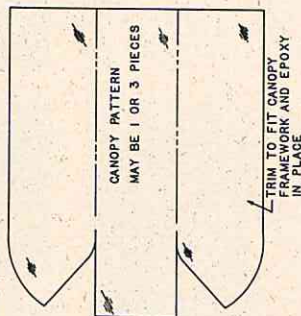
LEFT: Donna Baremore, wife of Albuquerque R/C Club President, poses for Max Mills' Ektachrome of author's BF-109E.
BELOW: First prototype of several BF-109's built by Carl Longfellow.



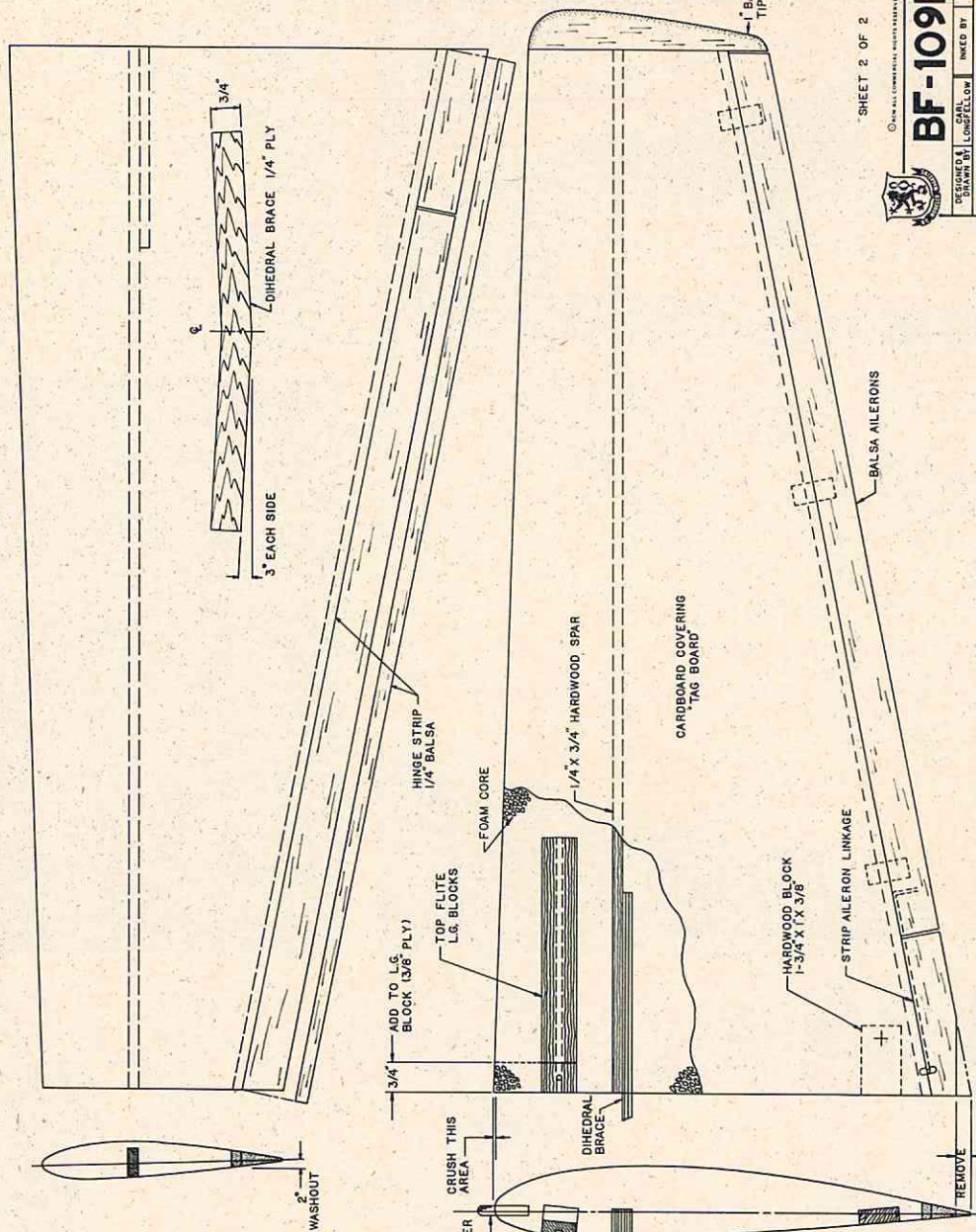




1/4" DIA. HOLE USED IN MAKING PATTERN FOR FIBERGLASS COWL



TYPICAL SERVO INSTALLATION



SHEET 2 OF 2

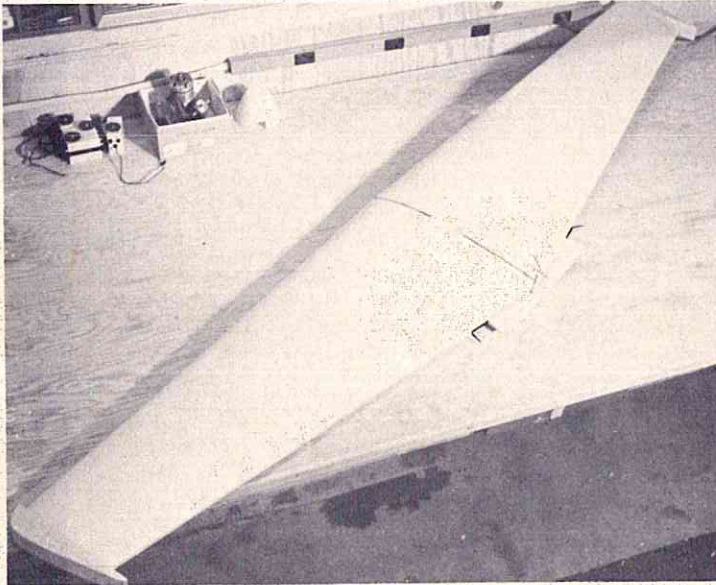
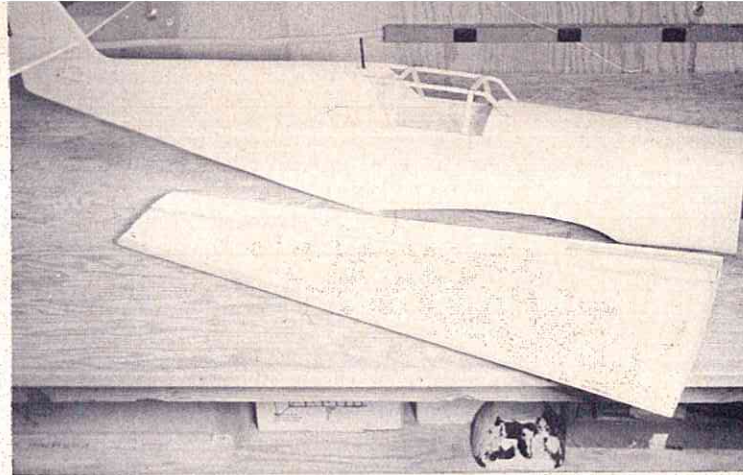
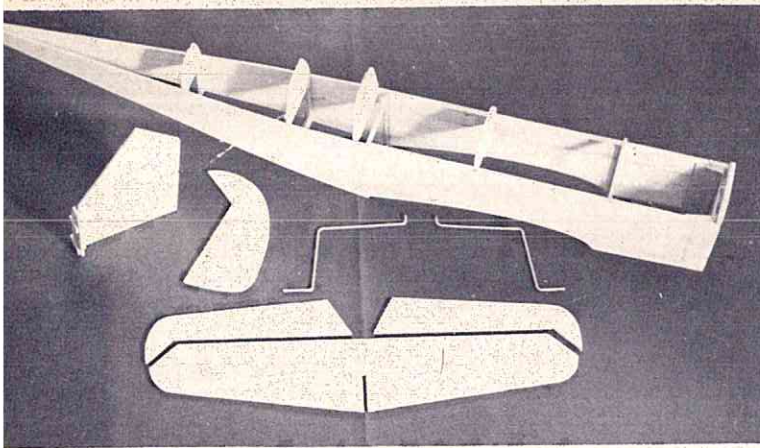
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BF-109E

DESIGNED & DRAWN BY	CARL LONGFELLOW	INKEE BY	CHUCK FELTON

PLAN NO 590



TOP ROW, LEFT: BF-109E basic structure.

ABOVE: Canopy framing, antenna feed-through, and one foam wing panel.

LEFT: Covered foam wing with linkage installed and rough-sawn wing tips in place.

BELOW, LEFT: Shaped foam pattern for cowling.

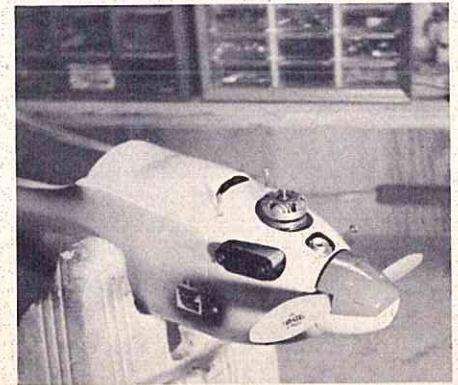
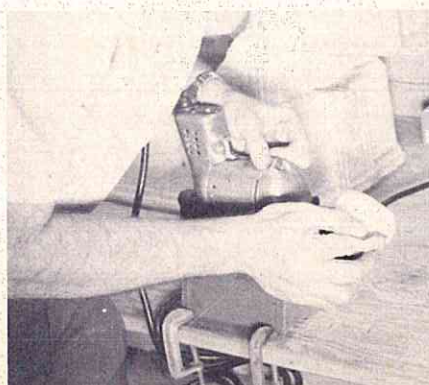
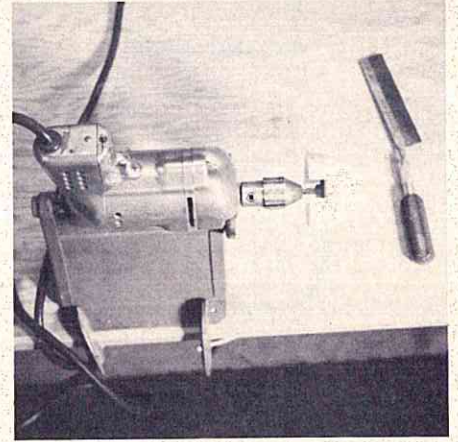
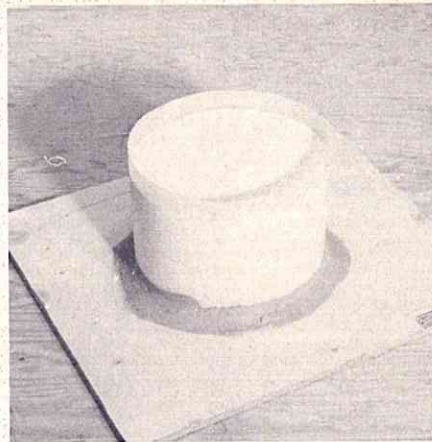
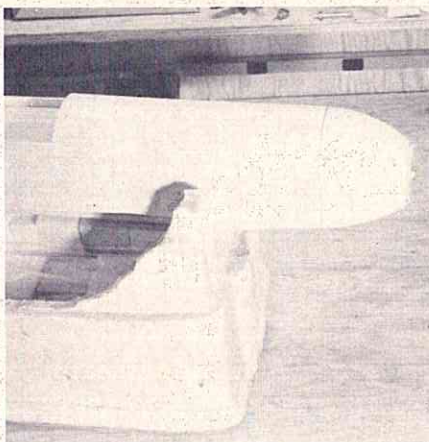
BELOW, CENTER: Molding plaster poured over pattern.

BELOW, RIGHT: Spinner set up to be cut off.

BOTTOM, LEFT: Sanding cut-off ABS plastic spinner to contour.

BOTTOM, CENTER: Finished cowl ready for installation.

BOTTOM, RIGHT: Cowling and spinner in place.





pilot (maybe some of you suppliers should think about that). Now cut out and install the canopy. The canopy may be made in one piece or in three pieces, whichever you prefer. I put mine on in 3 pieces, using 5 minute epoxy. Now mask off the entire cockpit area. Brush a coat of clear dope over the complete fuselage and tail section, sanding lightly when dry. Cover with wet silk and clear dope. Now brush a couple of coats of talc and clear dope, sanding after each coat. Do not sand into the silk! When good and smooth, spray on a coat of automotive primer. Now sand with #400 or #600 wet or dry paper, using it wet. Now you are ready for your finish. I used a "Profile" book to select my color scheme.

The cowling is next. First a pattern must be made. The easiest is to use soft balsa, but any wood or even foam will do. Cut a 2 3/4" diameter disc from 1/8" plywood and put a 1/4" diameter hole through the center. Put a 1/4" threaded rod through the firewall, the pattern block, and the 1/8" plywood disc. Tighten the block and disc against the firewall. Now start shaping the block to the final contour. Your pattern must be finished to a smooth and slick outer surface. I used acrylic laquer, rubbed out with Dupont #7 rubbing compound. Apply paste wax and polish to a high gloss. Now attach the pattern, large end down, to a piece of plywood or masonite, with wood screws. Cut the top and bottom out of a large plastic Clorox bottle, set it down over the pattern and seal it to the board with clay. Spray the inside of the plastic bottle and the pattern with mold release. Mix up a batch of

molding plaster and pour it into the plastic bottle until it covers the pattern by at least 1/2". After this has set, at least overnight, remove the clay from around the plastic bottle and carefully pull on the board and pattern until it comes out of the plaster. Now you should have a nice smooth female mold. Let it dry well — even baking in the oven for awhile works fine. Wax the inside with a good paste wax, polish, and spray with mold release.

You are now ready to lay-up the cowl. For cloth, I use old fiberglass drape material. It has a good tight weave, and is light in weight. Start by cutting some strips about 2" wide by 4" to 5" long. Mix up your resin; I use polyester, but there are others that will work just as well. Brush on a coat of resin, lay in the strips lengthwise, brushing resin through each strip. Do this until the whole mold is covered. Don't worry about the overlaps, they will not show, and will improve the rigidity of the cowl. Don't try to bend the strips around to the face of the mold, just let them stick up out of the mold. Be sure the cloth is filled well. After the resin has set-up, pull on the strips sticking out until the cowl pops out of the mold. Trim off the excess and wash well with detergent. Wet sand with #400 paper and spray with automotive primer. Wet sand again with #400 or #600 and it's ready for the final finish.

Now to the wings. I used a NACA 2415 airfoil, constant root to tip. "Hotwire" the cores from 2" thick foam. Rout out for the spars, landing gear blocks, and wing hold-down blocks. Install these, plus the

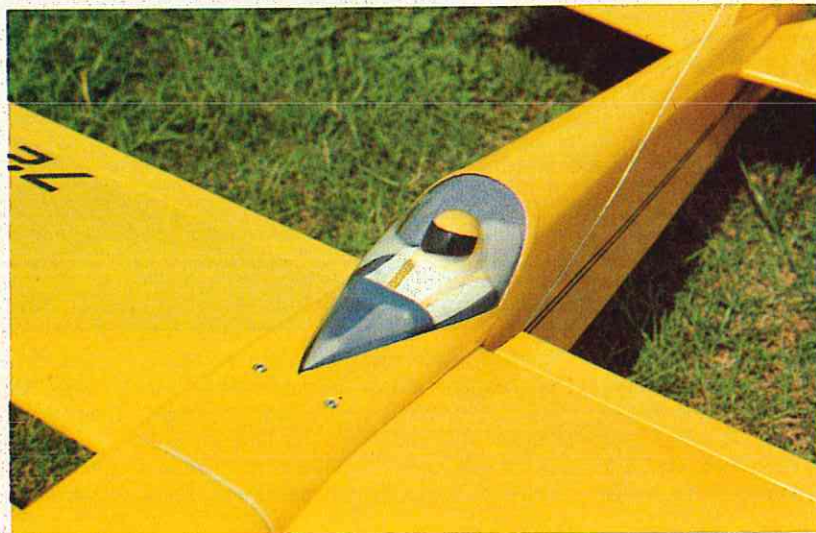
trailing edge hinge strip, using Titebond. After everything is thoroughly dry, sand the hinge strip to a taper matching the airfoil profile. For the wing covering I use "tag board." It can be purchased at most art supply or stationery stores for about 25¢ a sheet. First lightly sand the wing cores and brush clean. Now brush on a coat of water base contact cement on both the wing core and the tag board. Let both dry completely. Now you are ready to cover.

Making sure you have enough to cover both ends, line up the bottom trailing edge and touch it down to the tag board and, with one continuous motion, roll the wing core onto the tag board across the bottom of the core, around the leading edge and across the top, to the trailing edge. Through the whole operation apply pressure to get good contact all over. Now trim off the excess with a new razor blade. Add the wing tip blocks, sand them to shape being careful not to "rough up" the surface of the tag board. Fill the crack with "Dap" vinyl spackling compound and sand smooth. Join the two wings together per plans. Add a strip of glass cloth at the center, both top and bottom. Add your favorite strip aileron hardware. Make up and install the ailerons per plans. Fill the exposed balsa with a mixture of dope and talc and sand smooth. Spray on a very light coat of clear dope. Be sure not to soak through the tag board; if you do, your wing will melt inside. After this dries, do it again. Now sand very lightly and spray on a coat of primer, then wet sand with #600 paper.

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Build this high performance biplane for a rewarding new experience in sport and pattern flying.



SUN RAY



BY JACK SCARBROUGH

Designed as a new type of biplane for R/C models, this .60 powered plane has the sleek high speed appearance of the latest of the small full-size racing "sport biplanes." But in contrast to the pure racing type, the Sun Ray incorporates superior stalling, stability and control characteristics, comparable to the best design practice in R/C pattern planes. At the same time, the low drag inherent in the wing to fuselage and cockpit configuration is retained.

This is a fast biplane, highly maneuverable and performs all AMA and FAI patterns, is good for open pylon, and makes a great all around sport plane for the Sunday flyer. She's extremely steady and stable in high winds, with easy stall characteristics and slow landing speed. The wide stance landing gear sets up good control in ground maneuvers, landings, and take-offs. One of the most remarkable features of this airplane is its ability to do sustained knife edge flight, and starting from straight level flight, will climb out and complete a 270° knife edge loop! The plane is completely predictable in all flight maneuvers.

Major Construction Features

Both wings are removable, using standard leading edge locating dowels and aft nylon wing hold-down bolts. The cockpit enclosure and platform over the wing are one unit, removable to allow access to the upper wing hold-down bolts. The radio is reached from above, with upper wing removed. No hatches exist, access to the fuel tank and battery pack compartment being through the upper wing space and forward through a generously cut-out bulkhead. 1/16" plywood doublers inside the balsa fuselage sides run 24" back from the firewall past the wings. These doublers are necessary, especially with 2 wing saddle cut-outs. Landing gear wire has a minimum of exposed length, utilizing part of the "inverted gull" section of the lower wing, both for strength and air drag reduction. The lower wing is built on a full depth 1/4" thick plywood continuous spar, to assure maximum strength through the angled joints and center section. Most basic building features are normal, with easy construction throughout.



Wing Construction — Ribs

Begin by making all parts first before assembly. Make the ribs from 3/32" balsa. Neither wing is tapered, so for each wing, all ribs are the same. A fast and accurate way to cut duplicate ribs is to make two identical rib templates from hard 1/16" or 1/8" plywood — then sandwich 12 to 18 rectangular rough cut balsa rib stock between the templates. Drill two 1/8" or 3/16" holes along the rib centerline for bolting the assembly together. Cut the balsa on a power saw, or carve, then sand the balsa down to the templates. On the lower wing, each rib is made with an overhead tab joining the front and rear parts, because the full depth spar separates the rib into two parts. The tab allows us to easily install the rib accurately as if it were a one piece rib. After gluing, the tabs are cut off. These ribs can be easily made, using lower wing rib templates. 4 ribs only for the angle joints are made from 1/4" balsa. Use the lower wing templates, but finish sand slightly oversize as stated on plans. 6 lower wing ribs may now be cut out to accept the landing gear blocks.

Upper Wing

Notch all spars and leading and trailing edge pieces as shown on plans. Pin the 3/8" x 1/2" lower spar for one wing panel to a flat building board, and slide the nine ribs onto the spar, then pin the ribs to the notched trailing and leading edges. To insure a straight wing, make sure the spar is flat on the table, and leading and trailing edges are parallel to table. As an aid, the trailing edge may be blocked up 1/2" along the whole length of the panel. Then add the upper spar. Glue all joints and let dry. Add plywood dowel support. Drill the leading edge 1/4" and add dowel. The centerline of the dowel and support is 1" from the center of the wing. Add two 1/4" false ribs on to the dowel, above and below.

Add the leading and trailing edge sheeting to the top of the wing. Let dry. Then add the sheeting to the bottom of the wing, and finally the center sheeting. Add 3/32" capstrips and shaped wing tip blocks. Make these blocks by drawing the side and top views of the tip shape on balsa blocks,

SUN RAY

The Super Biplane

Designed By: Jack Scarbrough

TYPE AIRCRAFT

Sport and Competition Bi-Plane

WINGSPAN

Upper 51" — Lower 38"

WING CHORD

Upper 9" — Lower 6 3/4"

TOTAL WING AREA

700 Square Inches

WING LOCATION

Upper — Top of Fuselage

Low. — Bottom of Fuse. w/inverter gull

AIRFOIL

Symmetrical

WING PLANFORM

Constant Chord

DIHEDRAL, EACH TIP

No Dihedral

O.A. FUSELAGE LENGTH

50 1/2 Inches

RADIO COMPARTMENT AREA

(L) 11" X (W) 3" (avg) X (H) 3 1/2"

STABILIZER SPAN

21 Inches

STABILIZER CHORD (incl. elev.)

6 Inches (average)

STABILIZER AREA

126 Square Inches

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid-Fuselage

VERTICAL FIN HEIGHT

7 1/2 Inches

VERTICAL FIN WIDTH (incl. rudder)

7 Inches (average)

REC. ENGINE SIZE

.61 Cubic Inch

FUEL TANK SIZE

12 Ounce

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rudder, Elevator, Ailerons, Throttle

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa and Ply
Wing	Balsa and Ply
Empennage	Balsa
Weight Ready-To-Fly	120 Ounces
Wing Loading	24.6 Oz./Sq. Ft.

cut out one view on a jig or band saw, tape the block back together, and cut out the other view, then finish carve and sand to a rounded contour.

Repeat for the other wing panel. Place both panels on a flat surface and butt glue together — there is no dihedral. Sand the entire wing and reinforce the wing center section with 6" wide fiberglass cloth and epoxy.

Lower Wing

Make the 1/4" continuous plywood spar from a 36" long piece of high grade aircraft plywood. If that length is not available, use 2 pieces (about 19 1/2" long each), with a 2 1/4" overlap joint epoxied at the center section. That was done in the actual construction. Make the spar to the finish length spanwise of 36". To make a smooth overlap joint, 2 1/4" of each end forming the joint must be cut and rasped down to one half the thickness (1/8"). Then lay the spar flat on the table, with the lower edge of the outer panel sections pushed up against a straight edge laid on the table. This will set up the required zero dihedral on outer panels. Epoxy the overlap joint. Drill 1/4" holes for dowels in the center section, 1" from each side of the centerline.

Cut the leading and trailing edge pieces slightly overlength in 5 pieces each, 1 center section, 2 gull sections, and 2 outer panel sections. Notch for standard ribs as on plan except at the joints. Where all these pieces join at the gull section to form a 33° angle, easier assembly will result if they are pre-cut exactly to length at those joints. Lay each piece on the front view of the lower wing plan over the centerline shown, with notches lined up, and cut off each piece at each joint exactly to length and at the angle shown (16 1/2° each spar). No measurements or protractors are necessary with this method. Use the front view for both the leading and trailing edge pieces, but be sure the notches are facing in the correct direction (aft for leading edge; forward for trailing edge) before cutting off to length, and cut the angles for either the right or left wing panels. Now notch each piece at the joint to accept 1/2 of the 1/4" thick canted rib. The shoulder of the notch is cut at the

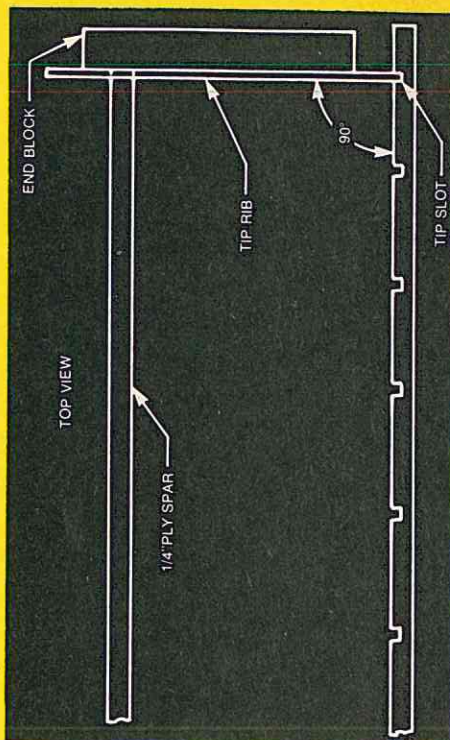
same angle as the cut-off angle, estimating by eye.

Assembly for this wing will go quickly by first setting the main spar upright on a flat table. The outer panel wing trailing edge must be blocked up with a 3/8" high balsa **straight** strip running the full length of each outer panel. Glue or tack the strip to the table and pin the trailing edges to the strip. Slip a rib over the spar on the outer wing panel near the tip, and set up the spar. Now tack a 4 or 5 inch long end block on the table at exactly a right angle (90°) to the trailing edge strip and against each end of the spar as shown in the sketch and photo. The end blocks will position the outer rib, so that the outside of the rib will be flush with the end of the spar. The ribs should be an easy slip fit (no tighter) over the plywood main spar.

Start the rib assembly on an outer panel. The idea is that the trailing edge pieces and the leading edge pieces are used to align the ribs for the whole assembly. The ribs are glued to the main spar **after** assembly. Slip the outer panel ribs down over the main spar, glue into the trailing edge slots and immediately glue in the leading edge. See that the bottoms of the ribs are flush with the table and the bottom of the main spar. Then place the two lower 1/4" canted ribs into position and tack glue on to the spar and leading and trailing edges. Use of a small 1/16" ply "angle gauge," as shown, is helpful. Continue assembling and gluing the ribs and leading and trailing edges up the gull section. Don't forget to set the ribs with landing gear block cut-outs in their correct location.

Next set the upper 1/4" canted ribs (with tabs **down**), and finally the double center section rib, and glue in the center section leading and trailing edges. Check alignment and glue all ribs to the main spar, and let dry. Set in the hardwood landing gear blocks, epoxying them tight to the main spar and to the ribs, then the plywood block support plates. Epoxy small (up-turned) landing gear slotted blocks on the inner end of each block. Finally, trim off all rib tabs, sanding the upper contour of the ribs flush with the plywood spar.

Sheet the gull section first, covered



completely. All sheets project back 3/4 of an inch aft of the trailing edge spar, the top overlapping the bottom sheet, to obtain a sharp trailing edge (see drawing). At the **inside** joints, bevel the sheeting as shown on the front view to obtain a tighter joint when rolling the sheeting back from the leading edge. Complete all sheeting **except** for the **upper** side of the center section. Drill the leading edge for the 1/4" dowels and glue into place through the holes pre-drilled in the spar, then add false ribs. Sheet the upper center section. Glue the 3/8" capstrips into place. Glue the tips into place. Glue the 1/16" ply aft wing plate onto the **bottom** of the lower wing. Cover the center section with 6" wide glass cloth and epoxy, extending the covering over the joint and down about 1" onto the gull section.

Fuselage and Tail Surfaces

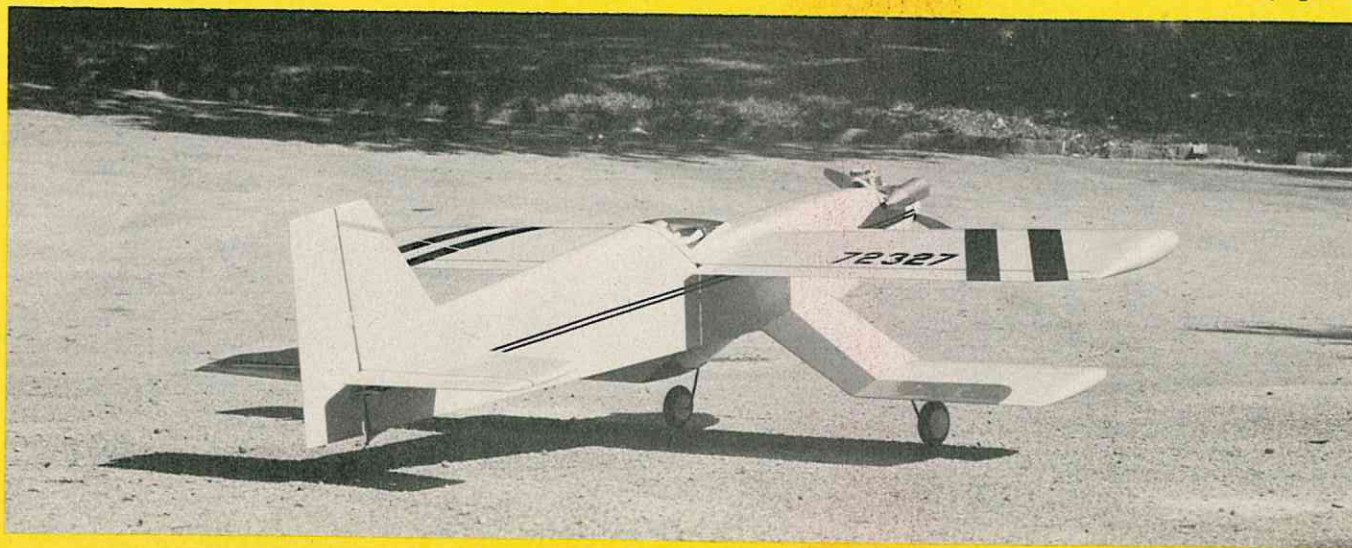
Cut out the fuselage sides from 3/16" x 48" balsa. Edge join two pieces to obtain the approximate 5 3/4" necessary

width, if sufficiently wide stock is not available. Fuselage sides should have 1/16" plywood inside liners cemented at this time with contact cement. Cut out the 1/4" plywood bulkheads and 1/2" balsa nose block.

Drill the firewall for your engine mount, and also for the throttle cable, fuel and vent lines. Draw the centerlines on each bulkhead and the nose block. On the inside of the fuselage sides, draw the bulkhead positions with straight lines. Draw a centerline on a flat table. Assemble the fuselage upside down with the top of the sides resting on the table. See that the centerlines of the bulkheads coincide with the table centerline. Use epoxy on the plywood bulkheads. Clamp or block the sides tight to the bulkheads. Join the fuselage rear, and add the 1/4" square balsa bracing (aft of bulkhead #3). Let dry. Before releasing the clamps, add the 1/4" triangular stock around the firewall, the bottom 3/4" stock in the tank compartment, and the 1/4" bottom balsa blocks. Then plank the aft fuselage bottom with 1/16" balsa cross grain. Let all glue dry, then release the clamps. Carve and sand the forward fuselage contours approximately to shape — sanding the nose later to the final 2 3/4" spinner diameter.

Cut out and glue the 1/4" aft stab plate onto the top of the fuselage sides. Note the forward portion is notched 1/16" to fit inside the turtle deck sheeting. Begin the turtle deck by gluing 1/8" square balsa along the top inner edge of the fuselage sides, to form a rabbet for the 1/16" sheeting to fit into. See section drawing. Cut bulkhead #3A from 1/4" balsa and formers F1 to F4 from 1/8" balsa. Glue these into position before notching for the stringers. After the glue is dry, pin each stringer into position, mark, notch and glue in place. Cover the deck with 1/16" balsa sheet in two pieces, to meet at the top center. Lay the edge of one sheet along the top center, and roll down and over the framework, marking it to fit flush with the top of the fuselage sides and into the rabbet. Use ammonia on the outside of the sheet to

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TIGER MOTH



When President Ford made his stirring speech asking everyone to send in their ideas on how to stem the rising tide of inflation, I responded immediately. My simple but eloquent letter read as follows:

*Dear Mr. President:
Have everyone build smaller model
airplanes.*

*Your friend,
Walter Mitchell, Jr.*

He replied by return mail, complimenting mine as a patriotic suggestion and me as a patriotic kid. He asked my age and requested a picture for publicity purposes. I sent him this keen photo, my favorite, of me in helmet and goggles affecting a pencil-thin moustache. Apparently the picture was not suitable. I have had no further communication from the President, only a peevish letter from one of his assistants requesting that I turn in my WIN button.

Maybe they have something **against** patriotic 45 year old kids. Whatever, my even-tempered personality allows me to shrug off what could well have carried the curdle of insult. Great men toil steadily upward while petty men bicker and sulk.

Washington's inconsistencies notwithstanding, the Schoolyard Tiger **does** do a good job of fighting inflation. Cost of glue and balsa is less than \$5.00. Silk has gone sky-high, but you could easily use silk-span, Jap tissue or even MonoKote. The Moth has such lift that it could handle more weight. Gas economy? We have been flying nearly every weekend for two months and still have not used a pint of gas.

The original Moth was designed by Sir Geoffrey de Havilland, a proper gentleman whose name is synonymous with British aviation. Sir Geoffrey first flew his "Cirrus Moth" in 1925; "Cirrus" from the name of the engine and "Moth" because the wings could be folded back like those of a natural-born, clothes eating moth for storage or transport. A number of Moth designs evolved, among them Gypsy Moth, Puss Moth, Moth Mayor, Metal Moth, Leopard Moth, Fox Moth, Hornet Moth and, of course, our Tiger Moth. If these sound like funny names for airplanes, consider how funny Englishmen talk anyhow. A learned fellow of my acquaintance, Ludlow Porch of Snellville, Georgia, claims all that English talk is put on . . . that if you woke an Englishman suddenly in the middle of the night, he would talk just like you and me. (*Editors note: RCM neither accepts nor rejects this theory, philosophy being outside the province of this magazine. The reader should know that Mr. Porch also firmly believes there is no such place as Montana.*)

But Tiger Moth it is, and she is queen of all the Moths. This sweet handling airplane gave the British wings and trained the Spitfire and Hurricane pilots who defended Britain in her finest hour in WW II. The ubiquitous Moth became so popular in Old

Cox Tee Dee .020 powered Ace pulse controlled schoolyard Tiger Moth beats inflated gas and balsa prices.

By Walt Mitchell

Photos by Bill Bell



Paul Cushing, Dave Mitchell, and the Gentle Tiger of the Schoolyard.

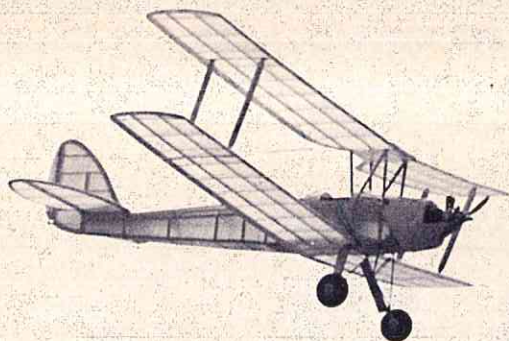
Blighty that people began to call all light planes "Moths." The prototype seems to have had a blue fuselage with clear doped, muslin covered wings and tail. The standard color for later models came to be silver, much as yellow became the color of the Piper Cub in this country.

The Schoolyard Moth is not scale but could be made so with a little attention to detail. Scale nuts should see "The Great Planes" published by Grosset & Dunlap, an excellent tome on all the old favorites with good pics of the Tiger Moth and other Moth variations. My wife gave me a copy for my 45th birthday (or bar mitzvah, as the French say), demonstrating yet again that women provide other amenities beyond preparing food and cleaning. Indeed, man does not live by model airplanes alone.

Though I spend all of my waking hours in the shop and take my meals there, my wife generally does not give me any grief over

what could be considered excessive modeling. But unless treated firmly, wives can be very dangerous to modelers, not from any desire on the part of women to destroy our hobby, but from a Darwinian instinct for survival. Who can blame them, eh? Who? You come home with a new kit in a box the size of a small coffin. "What is **that**?" your wife screams, startled by the introduction of a large, alien object into the domestic tranquility.

Careful now. Your answer may determine the success or failure of your next project. Don't try to lie or be evasive. Don't let your eyes dart about from side to side. Face the challenge squarely and say "This is a model airplane. I am going to build it. If, per chance, you don't like it, I this and that on your such and such." **Warning:** this is a hard line, and you should be prepared to back it up. She may say "Clyde" (if that be your name) "go ahead and this and that on



TIGER MOTH

Designed By: Walt Mitchell

TYPE AIRCRAFT

Sport or Stand-Off Scale

WINGSPAN

35 Inches (Both Wings)

WING CHORD

5 1/4 Inches

TOTAL WING AREA

372 Square Inches

WING LOCATION

Bi-Plane

AIRFOIL

Flat Bottom

WING PLANFORM

Constant Chord

DIHEDRAL, EACH TIP

1 1/4 Inches (Both Wings)

O.A. FUSELAGE LENGTH

26 1/4 Inches

RADIO COMPARTMENT AREA

(L) 4 3/4" X (W) 1 3/4" X (H) 1 1/2"

STABILIZER SPAN

12 1/2 Inches

STABILIZER CHORD (incl. elev.)

4 1/2 Inches (Average)

STABILIZER AREA

56 1/2 Square Inches

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top Of Fuselage

VERTICAL FIN HEIGHT

4 Inches

VERTICAL FIN WIDTH (incl. rudder)

4 Inches (Average)

REC. ENGINE SIZE

.020 Cubic Inch

FUEL TANK SIZE

1 Ounce

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

Single (Pulse)

CONTROL FUNCTIONS

Rudder Only

BASIC MATERIALS USED IN CONSTRUCTION

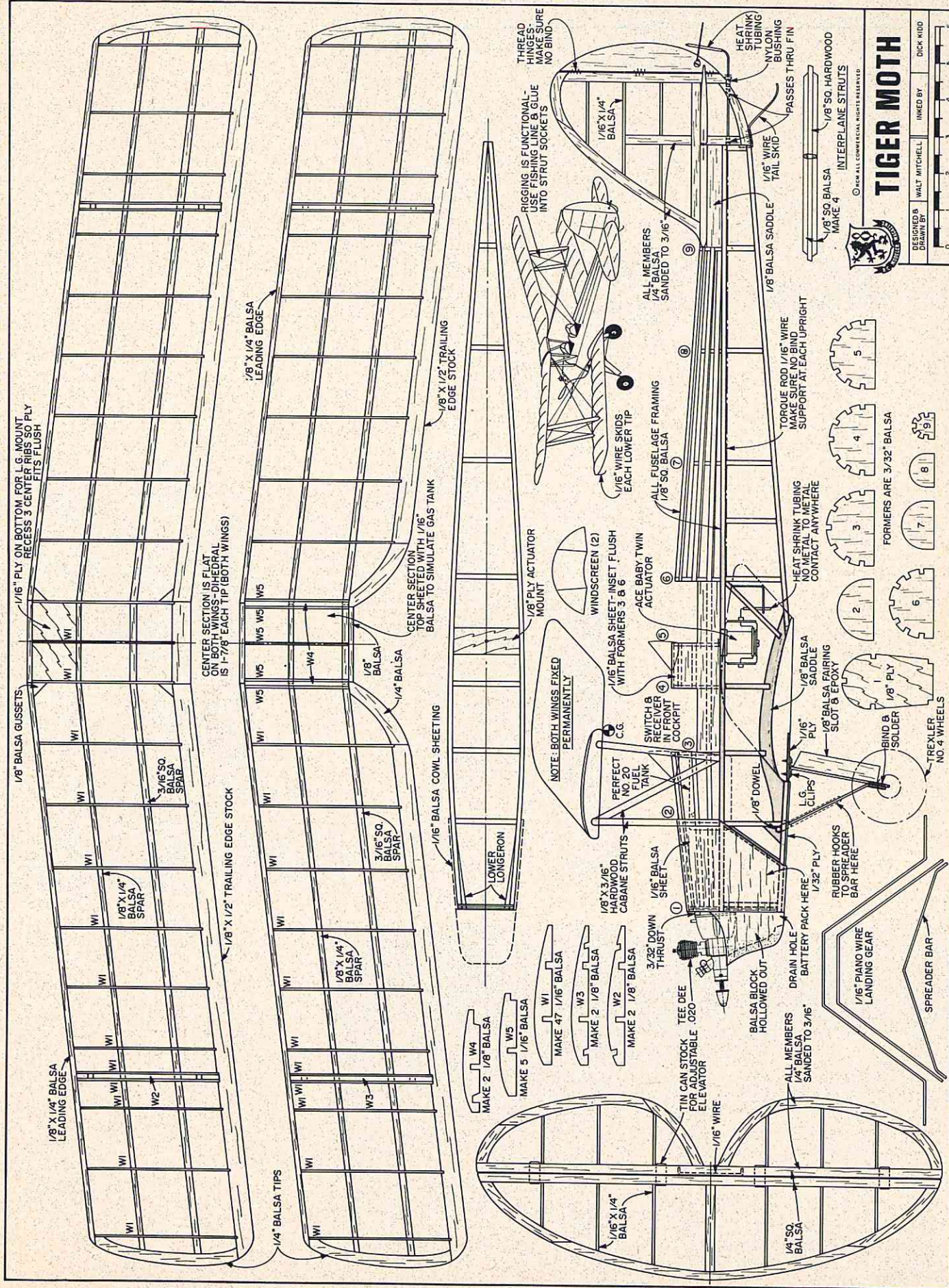
Fuselage	Balsa and Ply
Wing	Balsa
Empennage	Balsa
Weight Ready-To-Fly	12 Ounces
Wing Loading	4.6 Oz./Sq. Ft.

my such and such, if you dare." She may also offer to hit you in the mouth with a wagon spoke, a truly classical case of confrontation, for those of you who have studied transactional analysis — but I digress. Don Dewey made me promise to stick pretty much to technical details in this story, my past articles for RCM having wandered somewhat. So, back to the technology:

My drawings are from the Tern Aero design, scaled up with modifications for Ace R/C equipment. Covered with silk and carrying about eight coats of clear dope, the airplane weighs in at 3/4 pound all up. The plans should be self-explanatory. Note that the flying wires, which are fishing line, are functional and glued into the interplane and cabane strut sockets. Both wings are glued on permanently, avoiding the usual bird-cage hassle of a biplane. Access to the

R/C gear is through the cockpits. The prototype carries a reserve Perfect #20 gas tank as well as the tank attached to the Tee Dee. The larger tank will serve you best, once you have the Moth trimmed out to your satisfaction.

Trimming is **most important**. Hinged with light tin strips, the elevator is adjustable — but not in flight. You will be tempted to push forward or pull back on the Ace transmitter stick, but forget it. This airplane has to fly of its own accord. You can't force it through the air as you are accustomed to doing with the big bombs. You should R.O.G. on your test flight with a very small amount of down elevator. It will track with only slight rudder correction, and should run about 50 feet before breaking ground. If you have cranked in too much down, it won't get off the ground; but this is decidedly preferable to excess up,



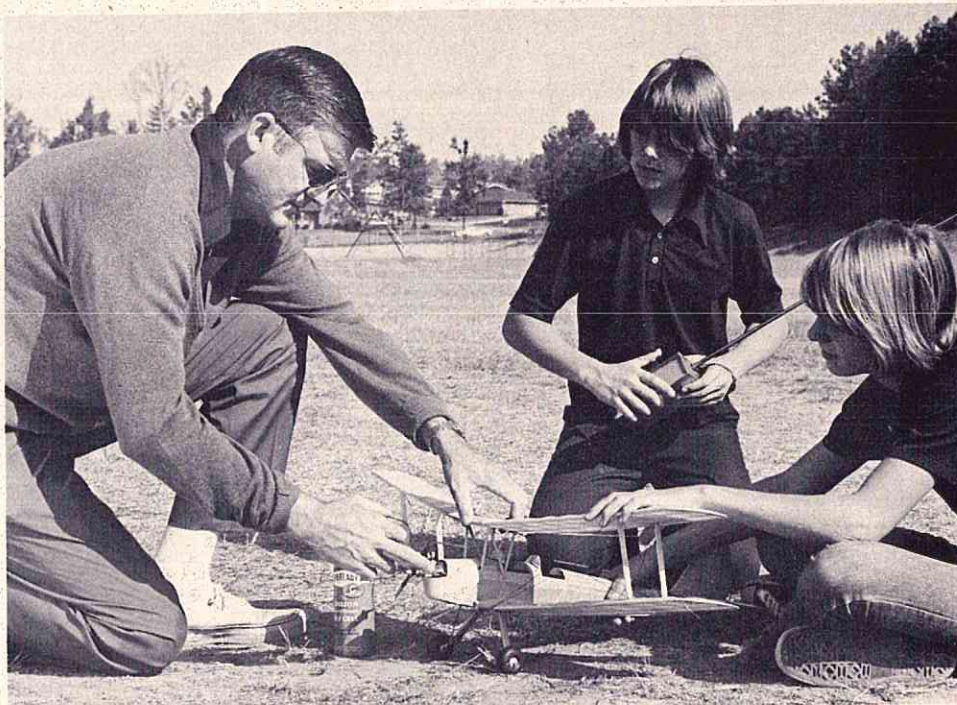


Note landing gear suspension system. Wing rigging is functional.

which will result in a series of stalls and consequent loss of control. If you do get into the air with too much up, take the top off of each stall with right or left rudder, driving the Moth into the wind in a series of "S" curves and get down as soon as possible. Adjustment is trial and error. Always make your error on the side of too much down elevator.

The Ace radio gear is simple, dependable, light (2½ oz.) and worth every penny you spend on it. An overnight charge will provide you with all the flying time you want. I'm not sure how much air time you can put on a single charge, but my kids have had it running continuously on the bench for an hour and a half. Maybe Ace could comment on this. If you need service, Ace will fix it and get it back to you with a turnaround time of about 10 days. Good

Intrepid author cranks .020 without chicken stick. Kids look on in awe.



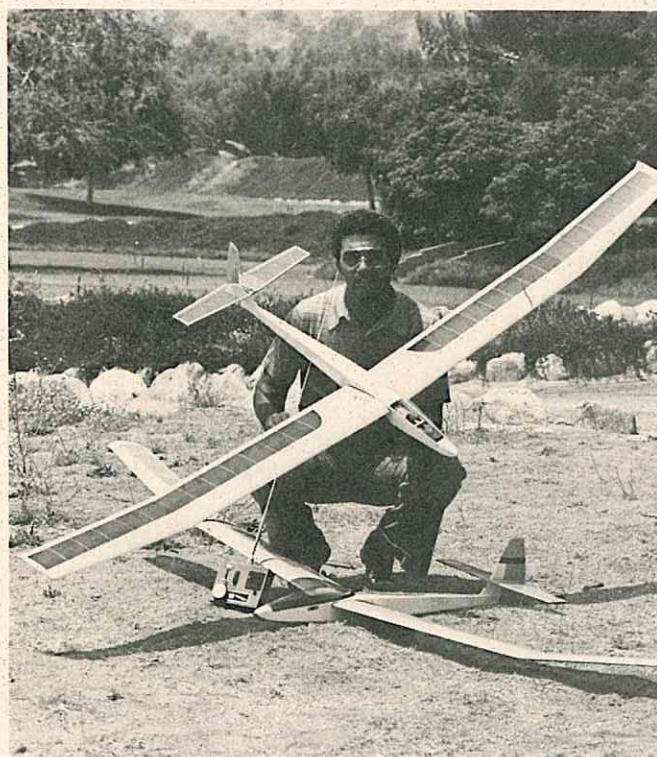
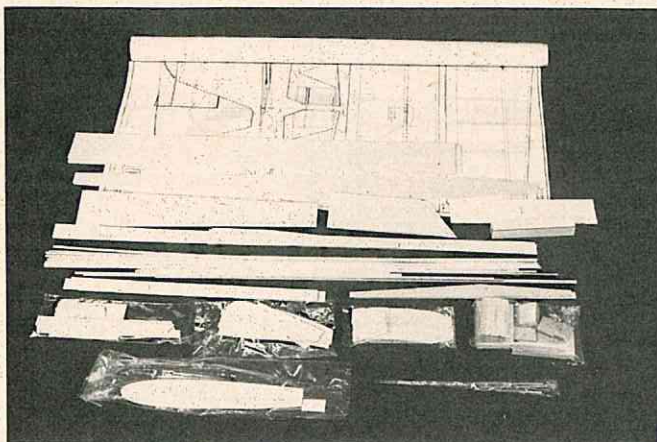
is long, slow, and flat and it touches down and rolls out like you wouldn't believe. You really **can** fly it at the schoolyard, and it will certainly draw a crowd, most of whom can't believe the little bird is being mysteriously influenced by radio waves.

You should build it, save a buck and have a ball. If it embarrasses you to go to an official R/C field with a little bitty single channel toy airplane, disguise kits are available from R/C Modeler Magazine at a reasonable price. These are quite effective and consist of a derby hat, clip-on beard and rubber cigar. □

Tiger Moth weighs in at 12 ounces, all up. Silk, with clear dope.

RCM PRODUCT TEST

**M & S LIMITED
CURIO**



● The Curio is the newest offering from M & S Limited, Box 39745, Los Angeles, California 90039, and is intended as a Standard Class competition sailplane as well as an all-around slope and thermal sport machine. The wingspan is 100" with a total wing area of 693 square inches and an all up weight of 28.5 ounces for an extremely light wing loading of 5.9 ounces per square foot. The kit is extremely well engineered, easy to construct, and of the several that we have flown, we feel it will be competitive with the best Standard Class sailplanes available today. Yet, the Curio is easy enough to fly for sailplane training purposes. We feel that it will make a fine light weather aircraft as well as flying under windy conditions on the slope due to its excellent penetration. On our first trim flight from a short Hi-Start into a 12 mph wind on a day with virtually no thermals present, the Curio recorded a 4 minute, 35 second flight time. Overall, the Curio is an excellent kit with performance ability to match its design and engineering. In fact, the designer Milt Swan is an extremely proficient competition sailplane pilot who has recorded many impressive wins with his new design. □

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging		●				Pre-Shaped Parts	●				
Plans		●				Parts Match to Plans	●				
Written Instructions		●				Overall Parts Fit	●				
Quality of Hardwood	●					Ease of Assembly		●			
Quality of Fiberglass			NA			Fidelity to Scale			NA		
Other Materials		●				Flight Performance		●			
Accessories		●				Overall Appeal		●			
Die-Cutting			NA								

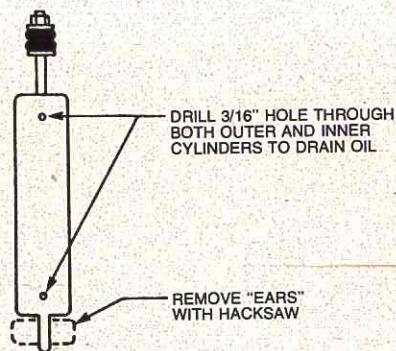
E=Excellent / G=Good / A=Average / F=Fair / P=Poor

SPECIFICATIONS

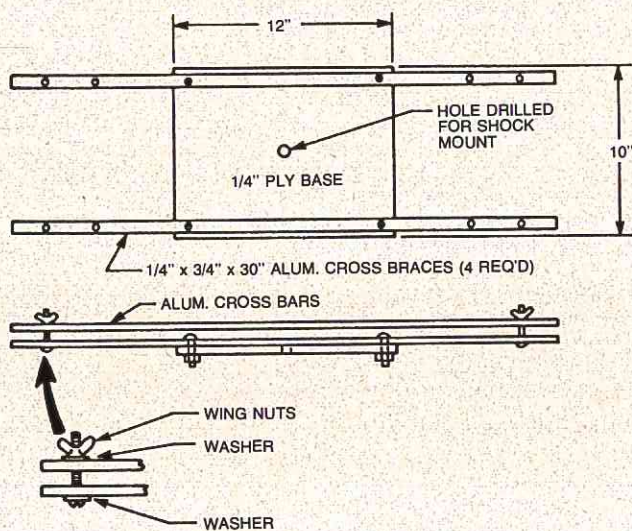
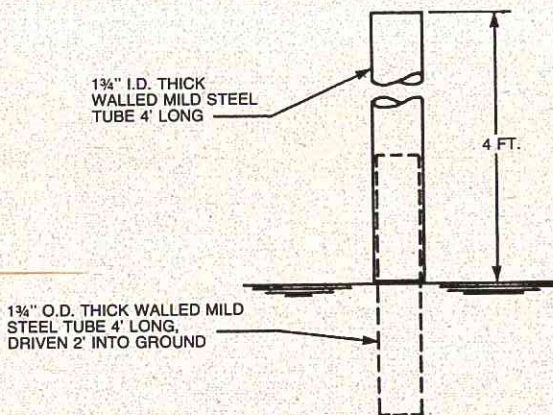
Name	Curio
Aircraft Type	Sailplane
Manufactured by	M & S Limited Box 39745 Los Angeles, California 90039
Mfg. Suggested Retail Price	\$44.95
Available From	Both Manufacturer and Retail
Mfg. Recommended Usage	Sport Sailplane, Competition Sailplane — Standard Class
Wingspan	100 inches
Wing Chord	7 1/2"
Total Wing Area	693 sq. in.
Fuselage Length	41 1/4 inches
Radio Compartment Dimensions	(L) 8" x (W) 2" x (H) 2"
Wing Location	Mid-Wing
Dihedral (each tip)	2 inches
Airfoil	Flat Bottom
Wing Planform	Swept L.E. Tip
Stabilizer Span	20 inches
Stabilizer Chord (incl. elev.)	3-11/16 (avg.)
Total Stab Area	not given
Stab Airfoil Section	Flat
Stabilizer Location	On fin 1 1/2" from top of fuselage
Vertical Fin Height	8 inches
Vertical Fin Width (incl. rudder)	5" (average)
Mfg. Rec. Engine Range	NA
Recommended Fuel Tank Size	NA
Landing Gear	NA
Recommended No. of Channels	Two
Recommended Control Functions	Rudder and Elevator
Basic Materials Used In Construction:	
Fuselage	Balsa and Ply
Wing	Balsa and Ply
Tail Surfaces	Balsa
Hardware Included In Kit	Wing pins and mounting hardware, stab wires
Plan Size	50" x 30" (1 sheet)
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (7 pages)
Photos	Yes
Kit Includes	Shaped parts
Mfg. rec. flying weight	27 ounces
Wing loading based on rec. flying weight	5.6 oz./sq. ft.
RCM PROTOTYPE	
Weight, ready to fly:	28.5 oz.
Wing Loading	5.9 oz./sq. ft.
Covering and finishing materials used	Flite Kote; DJ Trim
Engine Make and Disp.	NA
Muffler Used	NA
Radio Used	RS Systems
Tank Size Used	NA

HELICOPTER POLE

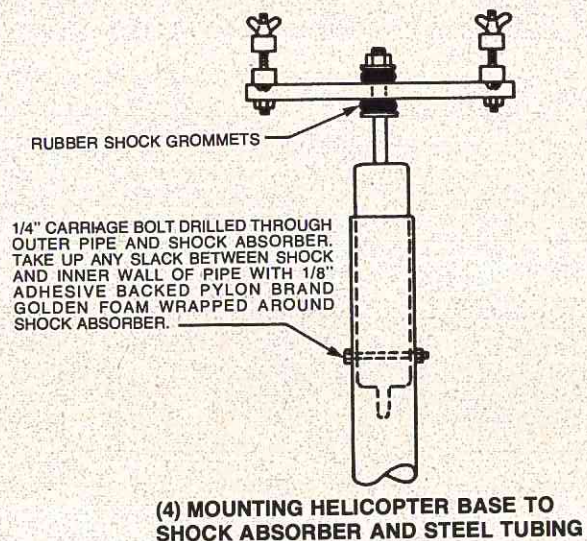
(1) MODIFICATION TO OLD FRONT SHOCK ABSORBER



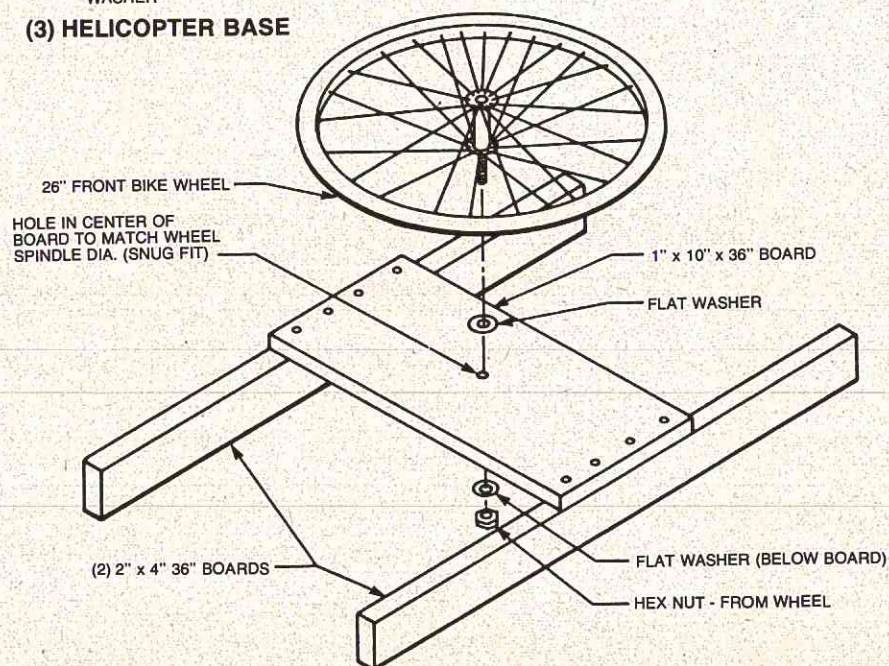
(2) INSTALLING STEEL TUBING SUPPORT



(3) HELICOPTER BASE



(4) MOUNTING HELICOPTER BASE TO SHOCK ABSORBER AND STEEL TUBING



(5) ALTERNATE HELICOPTER TRAINING "WHEEL"



LEFT: RCM's Helicopter Training Pole teaches you throttle-tail rotor torque response with no chance of damage to your chopper. BELOW: Daily use of RCM's Helicopter Training Table sharpens your reflexes on the cyclic controls.

BY DON DEWEY

PHOTOS BY BARBARA NORTON

FLIGHT TRAINING SEMINAR

Learning to fly an R/C helicopter rapidly and painlessly using proven training aids

● With the popularity of R/C helicopters increasing so rapidly throughout the world, we are commencing a multi-part seminar on the basic steps in learning to trim and fly your helicopter.

During the course of this program, contributions from various NRCHA members will be presented and, if you follow this seminar closely, and adhere to the steps outlined in it, you will find that your progress in learning to fly a radio controlled helicopter will be much more rapid and less painful, both on "down time" for repairs in the shop and on the pocketbook, than if you were to simply go out and buy a helicopter, "jam the throttle to it and see what happens." Since most of us went through the latter process in the early days of helicopters, we ended up buying substantial numbers of replacement rotor blades and flybars, straightening bent skids and landing gear braces, and the like. Hopefully, the method described in this seminar is a combination of several training aids which have been fully tested by R/C Modeler Magazine and have proven to be quite successful in helping the novice chopper pilot over the difficult early stages of trim and first flights.

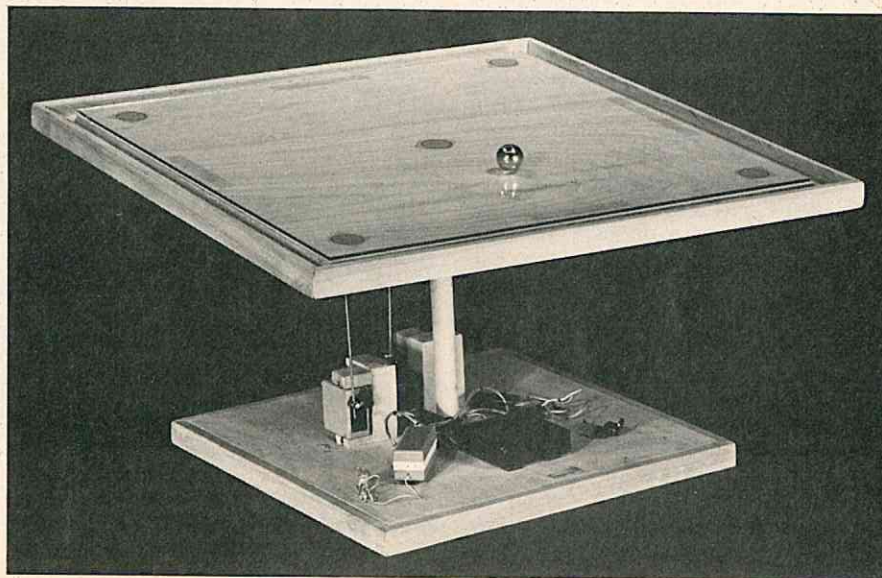
Unlike a fixed wing aircraft, the helicopter is capable of flying forward and backwards, left and right, rising up and down, as well as yawing, or swinging its tail from left to right. Thus, the reflex action necessary to control that helicopter requires a completely different type of training than is required for the fixed wing aircraft. To the novice, who lifts off his helicopter for the first time and finds that, while it is rising vertically in the air, it may also be moving forward and to the left, with the tail

swinging 180 degrees in one direction or the other, becomes completely disoriented and has no choice but to set it down rather roughly on the ground from whatever altitude he has attained. This usually results in a helicopter that tips over, breaks one, or both, rotor blades, twists the fly bar like a pretzel, and requires substantial repair time as well as costly replacement parts.

The object of this initial training program is to eliminate that repair time and replacement parts while learning just what the helicopter is going to do and how to trim it as closely as possible to neutral on all control functions. In addition, the program consists of training your reflexes to handle the tail rotor and throttle as well as the cyclic controls, and developing these reflexes to a

point where you stand a far better chance of getting the helicopter up and down under some semblance of control while sustaining little or no damage. In other words, we're going to learn to pat our head and rub our stomach simultaneously without becoming confused!

The first part of this training program will be divided into three segments: The first is a stationary platform on which we will mount the helicopter to run in the engine and adjust the carburetor for maximum performance. In addition, on this device, we will learn to control the tail swing caused by increasing or decreasing throttle, while also learning to handle a tilt of the helicopter both to the side and fore and aft. The second part of the program is to utilize the RCM Helicopter



Training Table on a daily basis to develop our reflexes on the cyclic control to handle an accelerating mass to a point where the cyclic control will become second nature to us. The third segment is to utilize a training fuselage for the scale type machines to avoid damaging the expensive fiberglass bodies or, in the case of the Du-Bro Shark, constructing a simple "platform" to use instead of the ABS plastic body which is so easily damaged during initial training flights, and which takes longer to put together properly than the rest of the helicopter.

To begin with, if you have a Kavan Jet Ranger or one of the Hegi Scale helicopters, order one of the D & B Helicopter Training fuselages from D & B Models, 8355 So. Mulligan, Burbank, Illinois 60459. The complete kit including landing gear and all hardware is priced at \$44.95 and is designed to absorb most of the abuse that you're going to hand out to your helicopter during the first few gallons of fuel. Completely simple to assemble, these rugged fuselages are completely interchangeable from the training frame to your scale fuselage in 30 minutes. They are made of wood and aluminum and can really take a beating but, if damaged, are easily repaired. Constructed completely of open framework, the D & B Training Fuselage allows easy access for adjusting and maintaining your helicopter components. We strongly recommend that you obtain one of these training fuselages and save that expensive \$100.00 fiberglass fuselage until you have learned to get your machine up and down in one piece.

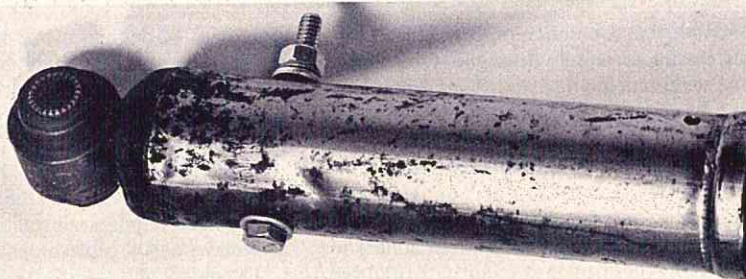
If you have a Du-Bro Shark, go ahead and make the ABS plastic body and either paint it with Hobbypoxy or trim it with DJ's Multi Stripe and trim sheets according to your preferences — but do not use it for the time being. Rather, make up a 1/4" plywood platform as shown in the sketch and the photographs, and paint it with a couple of coats of Hobbypoxy or Superpoxy finishing resin. Mount this platform on the bottom of the front landing gear skid brace, drilling two holes to match the holes already in the Shark skid brace and fuselage bottom. Mount it to the outside of the front skid brace with two 6-32 bolts and elastic stop nuts. Brace the platform with two lengths of 1/4" aluminum tubing, flattened at each end and drilled to accept sheet metal screws. Attach one end of each aluminum tube to the metal Shark body with a sheet metal screw in the top hole which has been pre-drilled at the factory for the sheet metal screw that normally holds the plastic body onto the Shark framework. The other end of each brace is attached to the plywood platform with 4-40 bolts and elastic stop nuts via two short lengths of 1/4" or 3/8" square hardwood which has been mounted on the plywood base. On this platform you can add sufficient nose weight to balance the Du-Bro Shark so that, when you lift the Shark with one finger under each side of the flybar, the rear end of the Shark's skids are approximately 1/2" off the ground before



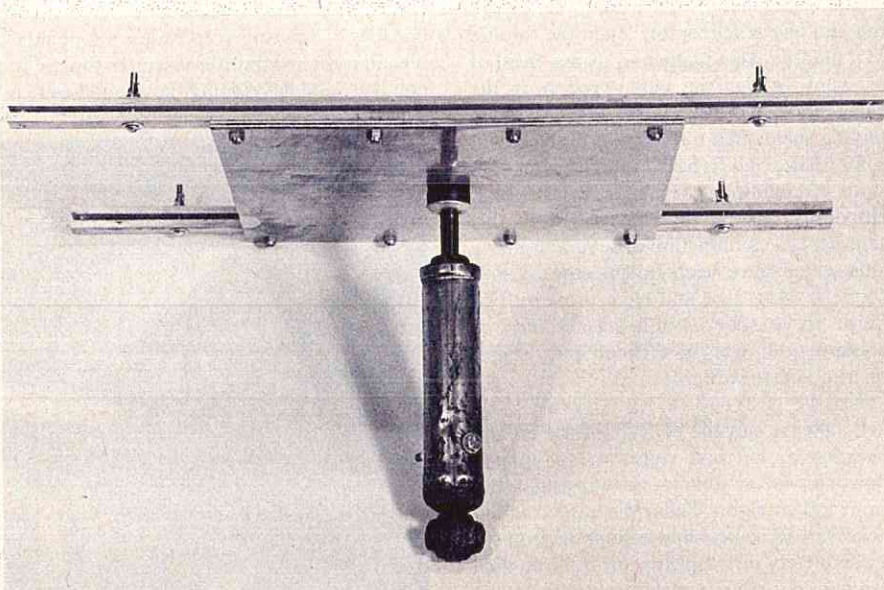
Close-up of front end of shock absorber. Metal "cup" seat between two rubber shock grommets is not used. Upper and lower metal "cups", rubber grommets, and nut are retained.



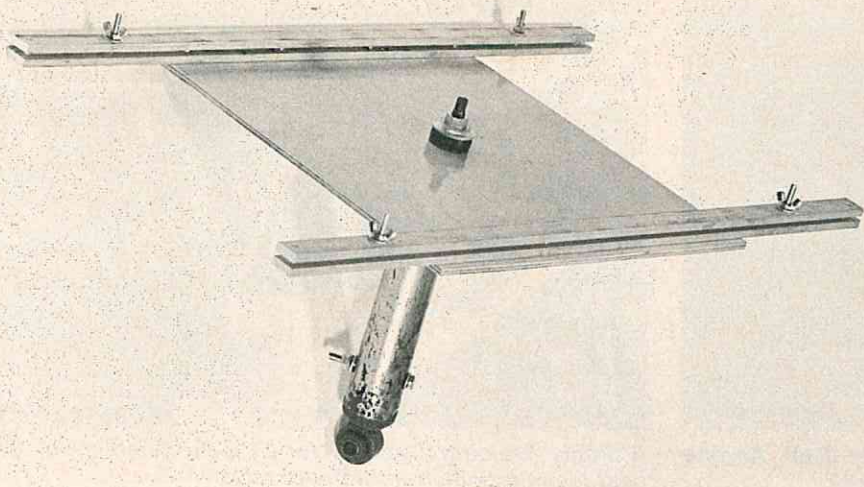
Photo shows two holes drilled to drain oil from shock absorber. Note that mounting lugs have been removed by hacksaw. New shock absorber shown for photo clarity only.



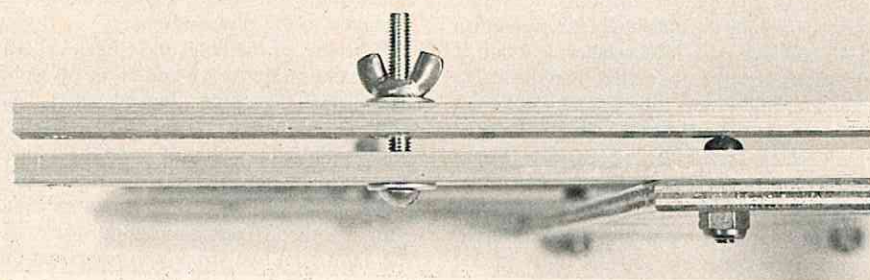
One-quarter inch carriage bolt temporarily installed in base of shock absorber. Later, this unit will pass through steel tubing and shock to mount entire unit to pole.



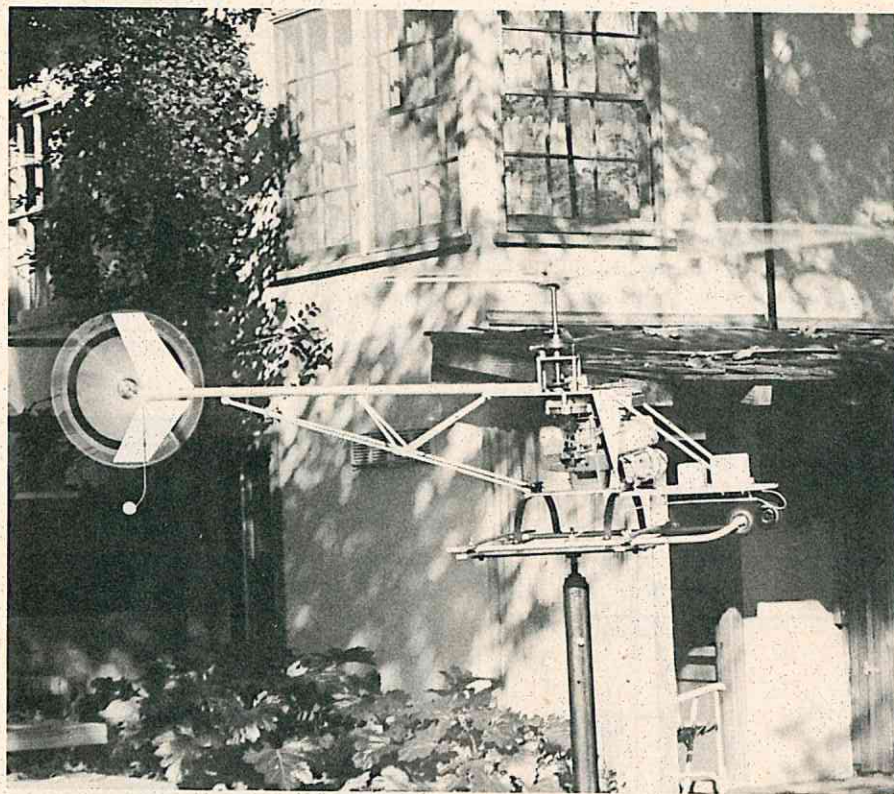
Shock absorber mounted to 1/4" plywood platform. Aluminum strips are mounted to the table with bolts and elastic stop nuts. Give ply two coats of resin.



Top view of helicopter platform. The amount of compression on the rubber grommets determines the degree to which the platform will tilt when cyclic control is given.



Close-up view of the aluminum strips. Bolt and wing nut spacing depends upon width of your helicopter skids. None of the material dimensions listed are critical.



Don Dewey's Du-Bro Shark mounted on helicopter training pole in editor's backyard. After you've passed the novice stage, you'll appreciate trimming your ship on this device.

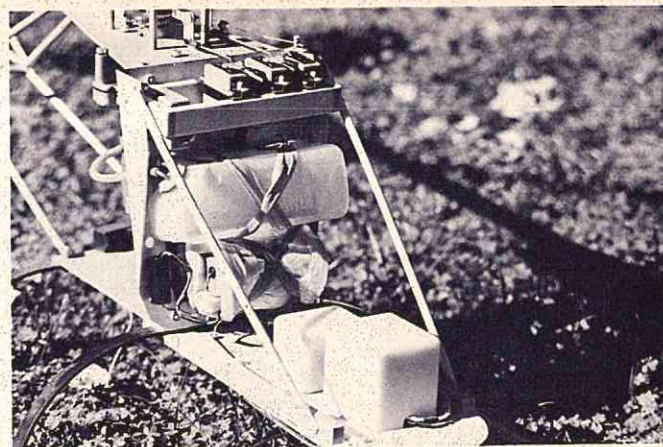
the front end of the skids leave the ground — this is the proper balance point as mentioned in the Shark assembly manual. Bar solder can be mounted to the front of the platform with servo mounting tape or with nuts and bolts until the proper Center of Gravity has been achieved. Alternately, you can use a 4.5 amp hour nickel cadmium connected to the glow plug to add weight and to prevent an engine failure at low throttle as illustrated in the December issue of RCM. This internal glow plug supply can either be triggered by a fifth servo and a double pole single throw switch or, simply, by a switch mounted on the platform which is turned on before the flight commences and off when it is terminated. In the case of the Shark, you have now created your own training fuselage which allows easy access to all of the servos, swash plate, control linkages, fuel tank and radio for any and all adjustments necessary during the early training period. In addition, you will save that plastic body for later on when it will be less likely to sustain crash damage. With your training fuselage ordered from D & B Models for your scale helicopter, or the training fuselage modification made to your Du-Bro Shark, we'll go on to the next step in this flight training program.

We are presenting with this article two helicopter training devices. The first is a stationary unit which can be semi-permanently mounted in your own backyard and which will allow you to learn to control the tail swing of your helicopter as you advance and retard the throttle as well as allowing the helicopter to tilt approximately 10 degrees fore and aft and to both sides. This unit was designed by Harold Derry (N22E) and has been subsequently built and used by RCM as a helicopter trainer with a great deal of success. In addition to being an excellent training aid, it also allows you to make any adjustments necessary on your helicopter while standing upright and, allows you to fully adjust your engine for maximum performance while the helicopter is affixed to a stationary device. Even after you have passed the initial training curve, you will find the RCM helicopter trainer pole to be an excellent device on which to trim each new helicopter, or to trim out a helicopter after repairs have been made.

The total cost of the training pole is approximately \$13.00 depending upon your source of supply. The materials required are one used front shock absorber from any car — an item which can be obtained free of charge from virtually any automotive repair shop. Be absolutely certain that you obtain a **used** shock absorber and not a new one — in fact, the more worn out the shock absorber is the better it will suit our purposes. The first step is to remove the "ears," or mounting lugs, at the base of the shock absorber. This can best be accomplished by mounting the shock absorber in a vice and removing the lugs with a hack saw. Next, drill a 3/16" diameter hole through both the inner and outer cylinders of the shock absorber at the top and bottom of the unit in



Wayne Craig's training wheel is simplicity itself. Anyone should be able to steal a wheel from his kid!



A simple "training fuselage" for a Du-Bro Shark saves the neat looking body from training rash!

order to drain out all of the oil inside the shock absorber. Once this has been accomplished, clean the shock on the outside and on the inside with butyrate dope thinner, MEK, or acetone to remove all traces of oil. Next, spray the movable shock absorber rod with silicone spray or Armor-All so that the rod will move as freely as possible.

Next, obtain two lengths of steel tubing which will telescope over each other. The inside diameter of the outer piece of steel tubing should match as closely as possible the outside diameter of the shock absorber you have chosen for this project. Take one piece of steel tubing and drive it 2' into the ground so that the remaining 2' protrudes above the ground. This can be set in the ground with ready-mix concrete if you desire a permanent mount, although it is not at all necessary.

Take the 4' outer length of tubing and slide the shock absorber down inside of it approximately 2/3 to 3/4 of the length of the shock absorber itself. Now drill a hole for a 1/4" bolt through both the outer tubing and completely through the shock absorber. Make sure that you have pulled the shock absorber rod up to the top of the shock absorber so that you do not drill through the piston inside. The hole in the shock

absorber should be drilled near the base as shown in the sketch. Mount the shock absorber inside the outer steel tubing using a 1/4" carriage bolt, lock washer, and nut. If the shock absorber is smaller than the inside diameter of the steel tubing, and you do not have a tight fit, wrap one or more layers of 1/8" thick Pylon Brand Gold'N Foam (adhesive backed one side) around the shock absorber until it is a tight fit inside the steel tubing. Now mount the shock absorber to the steel tube and slip the outer tubing over the 2' section of tubing protruding from the ground. You now have a 4' high pole with a beat up shock absorber mounted at the top.

The next step is to construct a platform on which you will mount your helicopter. This consists simply of a 12" x 13" rectangle of 1/4" or 3/8" plywood which has been coated with a couple of coats of polyester finishing resin. Find the exact dead center of the rectangle and drill a hole to accept the threaded top of the shock absorber rod, making sure it is a tight fit on that rod. Next, cut 4 lengths of 1/4" x 3/4", or 1/4" x 1" aluminum strips approximately 30" to 36" long. Put these 4 pieces in a vice and drill 1/4" holes equidistant from each end that will be slightly wider than the total width of your helicopter skids. In addition, in two of

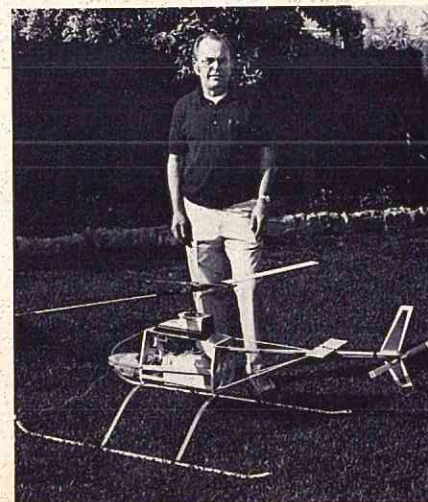
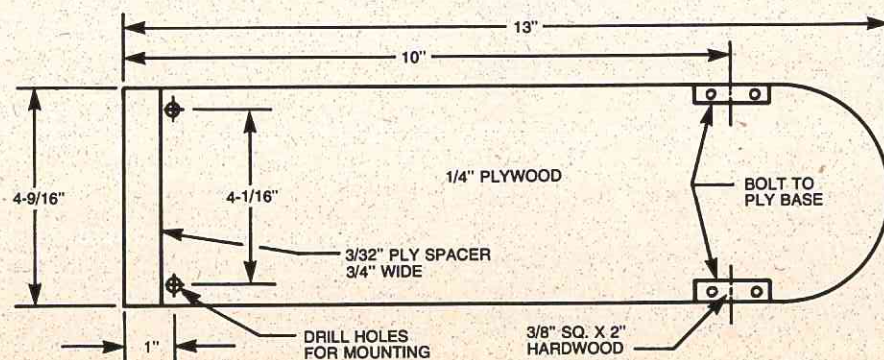
these straps, drill two additional mounting holes so that the straps, themselves, can be mounted to the plywood base.

When all of the holes have been drilled, mount one strap to each end of the plywood base using 1/4" bolts, lock washers, and nuts. The holes that you have drilled slightly wider than the width of your helicopter skids will enable you to set your helicopter on top of the plywood platform with its two permanently affixed aluminum strips and the additional two strips will pass over the skids and hold the helicopter firmly in place, with two 1/4" bolts and wing nuts. Both of the rubber grommets on the shock absorber should be used, one above and one below the plywood mounting plate. The flexibility of these grommets, combined with the weight of the helicopter, will allow the helicopter to tilt approximately 10 degrees in all directions of cyclic control when the swash plate is moved on your helicopter.

For those of you who do not have room in your back yard for such a stationary training device, or if you are in an area where the noise would definitely bother your neighbors, we suggest constructing the training unit suggested by Wayne Craig (N10E) which is used as a training device by

to page 90

Construction of the Shark training fuselage takes only a few minutes. RIGHT: DB Models training fuselage ideal for Schluter or Kavan machines.



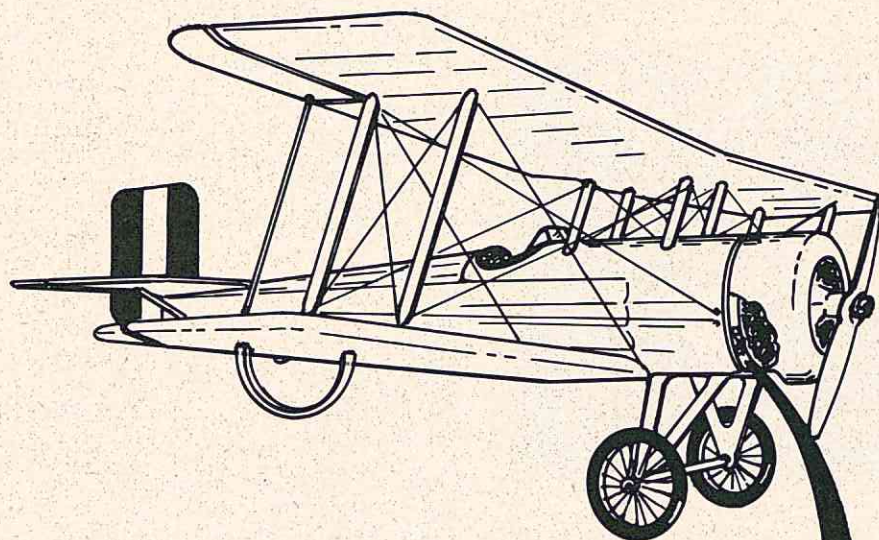
HERE'S HOW

BY JERRY SMITH

MOST ENGINE COWLS ON R/C MODELS ARE FASTENED TO THE FIREWALL WITH SCREWS. AND THAT'S A FACT. SOONER OR LATER VIBRATION FROM THE ENGINE BACKS OUT THE RETAINING SCREWS AND THE COWL IS LOST IN FLIGHT. OR — IMPROPER LOCATION OF THE COWL MOUNTING FLANGE CAUSES A LOCALLY OVER-STRESSED CONDITION ON THE COWL, WHEN THE RETAINING SCREW IS DRIVEN HOME, AND AGAIN VIBRATION DOES THE REST. TO OVERCOME THIS BAD SCENE, THE FOLLOWING METHOD SHOULD AND WILL END ALL YOUR COWL FASTENING PROBLEMS.

AND, OF COURSE, THE HEART OF THIS METHOD IS THE BALL STUD AND SOCKET ASSEMBLY MANUFACTURED BY AMERICAN VECTOR INC. NO LOOSE PARTS OR SCREWS TO BACK OUT. THE COWL SIMPLY POPS OFF AND SNAPS ON WITH NO SPECIAL TOOLS. JUST YOUR HANDS. A REAL BONUS AT THE FLYING FIELD WHEN IT BECOMES NECESSARY TO GET AT THE ENGINE.

THE COWL ON MY BRISTOL SCOUT IS RETAINED BY THIS METHOD AND HAS FLOWN MANY HOURS WITHOUT INCIDENT. IN FACT, NOT ONE SIGN OF BEING THE LEAST BIT LOOSE. I HAVE FOUND THIS METHOD OF ATTACHMENT TO BE SIMPLY OUTSTANDING. GREAT FOR RETAINING ANY TYPE OF COWL ON YOUR R/C MODEL!



1 BALL STUD AND SOCKET ASSY
3 FOR \$1.00 POSTPAID

A LIMITED SUPPLY OF THIS FASTENING DEVICE IS
AVAILABLE FROM ME. THE MANUFACTURER
WILL NOT BOTHER WITH SMALL ORDERS —

WRITE TO
JERRY SMITH
11363 KATHMERE DR.
OSCEOLA, IN. 46561

1/8" PLYWOOD RING
EPOXY TO FIREWALL

FIREWALL

RELIEVE FOR SCREW
HEAD

#4 MACHINE SCREW

1/2" BALL STUD

1/2"

1/16" PLY RING

COWL

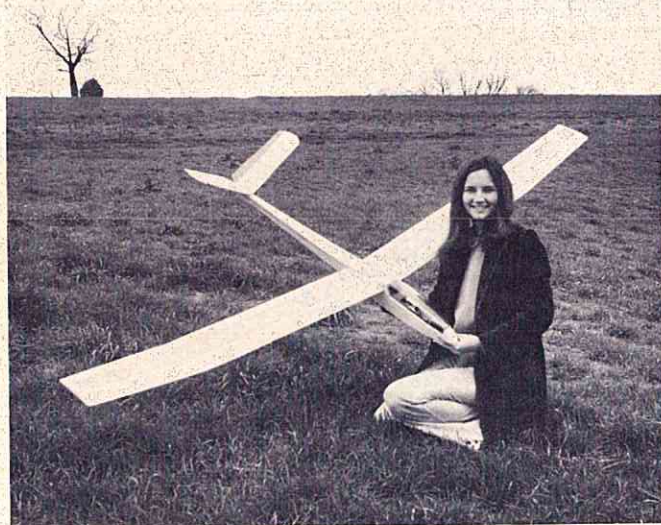
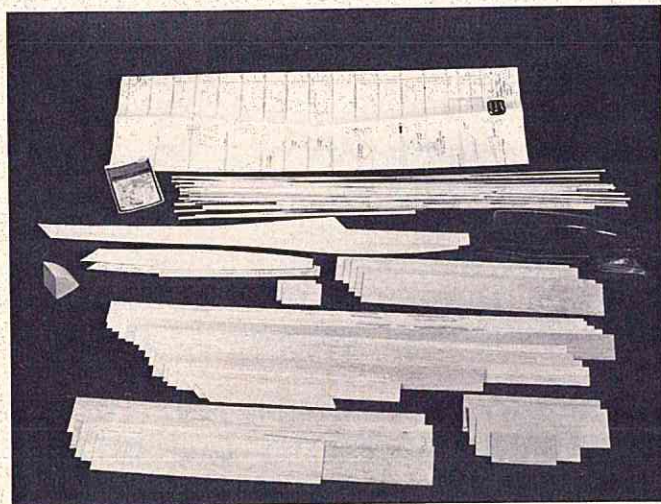
STAPLE & EPOXY
SOCKET TO RING

TYPICAL SECTION

BALL STUD AND SOCKET ASSY
3 REQD — SPACED APPROX. 120°
APART FOR MOST APPLICATIONS.

RCM PRODUCT TEST

PRO-MODEL PRODUCTS APOLLO



● The Apollo from Pro-Model Products, is a Standard Class sport and competition sailplane. Our prototype was built by Carol Guzman as her "first ever" construction project. In fact, the only other plane she had ever built was a Delta Dart. The plane is not really suitable for the complete novice, but any modeler who has built one R/C aircraft should have no trouble with the Apollo. Assistance was given to Carol by an experienced modeler when it came to the wing pin alignment, V-tail linkage, and radio hook-up. The sliding servo installation was used rather than the mixer provided in the kit simply because the radio compartment wouldn't hold the larger EK-logictrol system used. However, the Apollo is designed to hold any-brick or small two channel system. The Apollo has striking lines and the light weight of this sailplane produces slow, docile flight characteristics. While the fuselage could stand some beefing up, the wings are extremely durable and ballast up to 12 ounces or more can be carried with no problem. The plane is fully competitive in Standard Class competition. Flying characteristics are excellent with a good speed range and smooth circling thermal capability. The plane has particularly good handling qualities on the launch and ranks in that category with the best sailplanes in the Standard Class. In fact, it is our opinion that it would be easier for a beginner, or average flier, to get consistently high launches with this plane than with many of the commercially available machines in the 100" class although an expert can obtain virtually the same altitude with almost any of them. □

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging		●				Pre-Shaped Parts		●			
Plans		●				Parts Match to Plans			●		
Written Instructions		●				Overall Parts Fit		●			
Quality of Hardwood		●				Ease of Assembly		●			
Quality of Fiberglass			NA			Fidelity to Scale			NA		
Other Materials		●				Flight Performance	●				
Accessories			●			Overall Appeal	●				
Die-Cutting		●									

E=Excellent / G=Good / A=Average / F=Fair / P=Poor

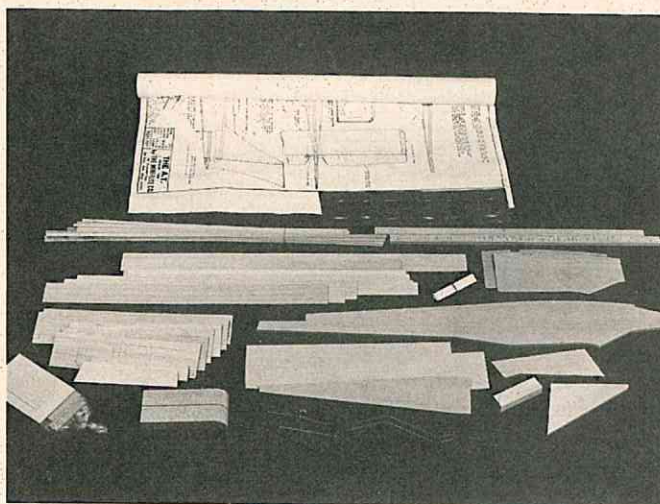
SPECIFICATIONS

Name	Apollo
Aircraft Type	Sport and Competition Sailplane
Manufactured by	Pro-Model Products P.O. Box 5182 Ft. Wayne, Indiana 46805
Mfg. Suggested Retail Price	\$40.00
Available from	Both Manufacturer and Retail
Mfg. Recommended Usage	Sport or Competition Sailplane — Standard Class
Wingspan	99½ inches
Wing Chord	6¾"
Total Wing Area	640 sq. in.
Fuselage Length	44½ inches
Radio Compartment Dimensions	(L) 9" x (W) 2" x (H) 2"
Wing Location	Mid-Wing
Airfoil	Flat Bottom
Wing Planform	Double Taper
Dihedral (each tip)	7 inches
Polyhedral	8 inches
Stabilizer Span	24 inches
Stabilizer Chord (incl. elev.)	5½"
Total Stab Area	132 sq. inches
Stab Airfoil Section	Diamond and Hinged Surface
Stabilizer Location	V-Tail
Vertical Fin Height	Not given
Vertical Fin Width (incl. rudder)	Not given
Mfg. Rec. Engine Size	NA
Recommended Fuel Tank Size	NA
Landing Gear	NA
Recommended No. of Channels	Two
Recommended Control Functions	Elevons
Basic Materials Used In Construction:	
Fuselage	Balsa
Wing	Balsa and Spruce
Tail Surfaces	Balsa
Hardware Included In Kit	V-Tail mixer, wing pins and tubes, tow hook
Plan Size	36" x 56" (1 sheet)
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (4 pages)
Construction Photos	No
Kit Includes	Die-Cut Parts
Mfg. recommended flying weight	29 ounces
Wing loading based on rec. flying weight	6.5 oz./sq. ft.
RCM PROTOTYPE	
Weight, ready to fly:	33 oz.
Wing loading	7.4 oz./sq. ft.
Covering and finishing materials used	Yellow and Clear MonoKote, striping tape
Engine Make and Disp.	NA
Muffler Used	NA
Radio Used	Logictrol 4 Ch.
Tank Size Used	NA

RCM PRODUCT TEST

MINI-FLITE COMPANY

A.T.



● The A.T. advanced trainer from the Mini Flite Company, 48 Princeton Street, Red Bank, New Jersey 07701, has a wingspan of 50" and a total wing area of 390 square inches and is designed for engines from .19 to .30 cubic inch displacement. This aircraft was designed by the manufacturer to be slanted toward the second or third model for a beginner and, possibly the first with ailerons. As such, aileron mounting and control hardware might well have been included in the kit to facilitate construction for the beginner. The possibilities of this aircraft to Stand-Off Scale are so great that we would recommend a bolt-on wing which would greatly enhance the overall appearance of this excellent aircraft. The only criticism that we have of the design and construction is that the 1/8" diameter main gear wire is quite marginal for grass or rough field flying due to the all-up weight of 60 ounces although it is adequate for smooth runways if rough landings are avoided. Only normal trimming was required for the first flight and it was found that the ailerons are very effective with an excellent roll rate. The large rudder turns the aircraft inside out so be sure to limit the throw for the first flight. Tracking on a grass field was poor due to extreme flexing of the landing gears as previously mentioned. Overall flight characteristics are excellent and the aircraft fits the bill for an advanced trainer or first aileron ship. It is extremely impressive in flight due to its scale-like appearance and is also recommended for small field flying on engines in the range specified. □

IMPRESSIONS	E	G	A	F	P	IMPRESSIONS	E	G	A	F	P
Packaging	●					Pre-Shaped Parts	●				
Plans		●				Parts Match to Plans		●			
Written Instructions		●				Overall Parts Fit		●			
Quality of Hardwood		●				Ease of Assembly		●			
Quality of Fiberglass			NA			Fidelity to Scale		●			
Other Materials		●				Flight Performance	●				
Accessories		●				Overall Appeal		●			
Die-Cutting	●										

E=Excellent / G=Good / A=Average / F=Fair / P=Poor

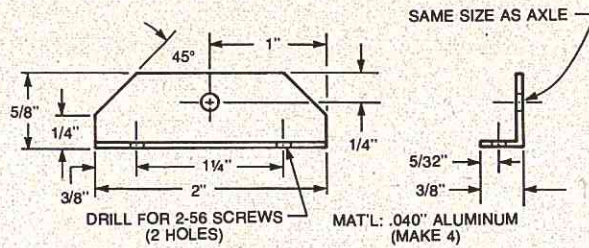
SPECIFICATIONS

Name	The A.T. (Advanced Trainer)
Aircraft Type	Sport — Stand-Off Scale
Manufactured by	Mini Flite Co. 48 Princeton Street, Red Bank, New Jersey 07701
Mfg. Suggested Retail Price	\$34.95
Available from	Retail Outlets
Mfg. Recommended Usage	Advanced Powered Trainer
Wingspan	50 inches
Wing Chord	8 inches
Total Wing Area	390 sq. in.
Fuselage Length	34 inches
Radio Compartment Dimensions	(L) 7.5" x (W) 2.7" x (H) 4.5"
Wing Location	High Wing
Airfoil	Semi-Symmetrical
Wing Planform	Swept T.E.
Dihedral (each tip)	1/2"
Stabilizer Span	17 inches
Stabilizer Chord (incl. elev.)	5.5 inches
Total Stab Area	93.5 sq. inches
Stab Airfoil Section	Flat
Stabilizer Location	Top of Fuselage
Vertical Fin Height	6 inches
Vertical Fin Width (incl. rudder)	5 inches
Recommended Engine Size	.19 to .30 cu. in. disp.
Recommended Fuel Tank Size	Not Given
Landing Gear	Tricycle Gear
Recommended No. of Channels	Four
Recommended Control Functions	Rudder, Elevator, Throttle, Ailerons
Basic Materials Used In Construction:	
Fuselage	Balsa and Ply
Wing	Balsa
Tail Surfaces	Balsa
Hardware Included In Kit	Nosegear block and pre-formed wire main gear, vacuum formed wheel pant hlvs, land. gear retaining straps, elv. control wire, tape for wing center section
Plan Size	48" x 36" (1 sheet)
Building Instructions on Plan Sheets	Yes
Instruction Manual	No
Construction Photos	No
Kit Includes	Die-Cut Parts
Mfg. Rec. Flying Weight	64 ounces
Wing loading based on rec. flying weight	23.6 oz./sq. ft.

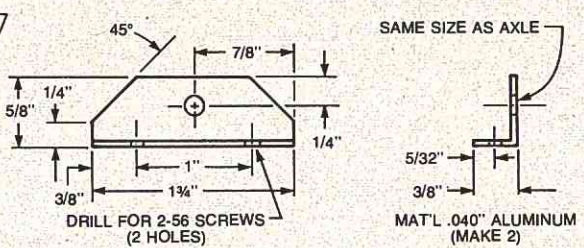
RCM PROTOTYPE

Weight, ready to fly	60 ounces
Wing Loading	22.1 oz./sq. ft.
Covering and finishing materials used	Solarfilm w/DJ Trim, K & B Superpoxy on wheel pants
Engine Make & Disp.	Super Tigre .23
Muffler Used	Expansion
Radio Used	EK-logictrol
Tank Size Used	4 ounces

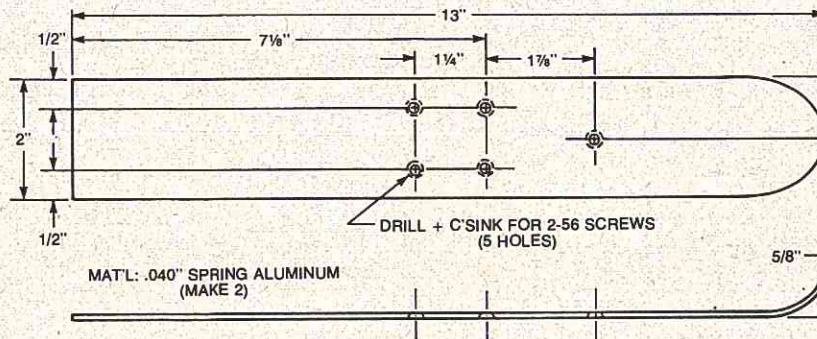
MAIN SKI BRACKET



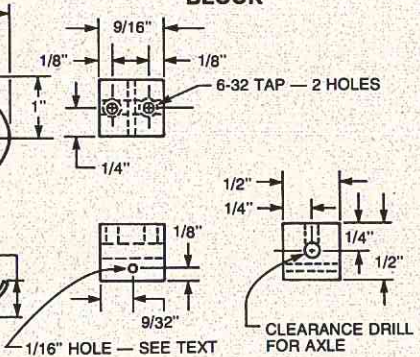
FRONT SKI BRACKET



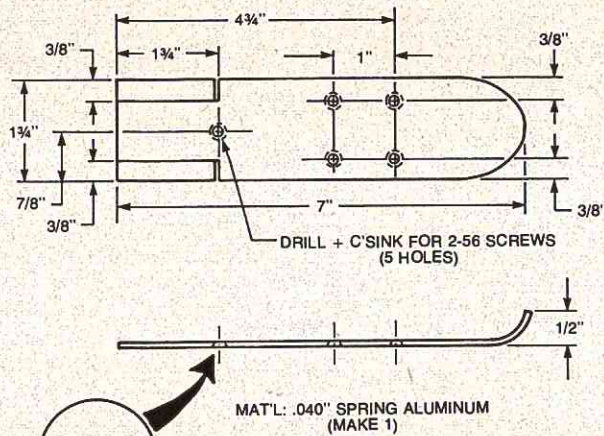
MAIN SKIS



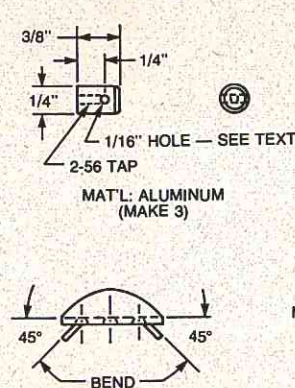
BLOCK



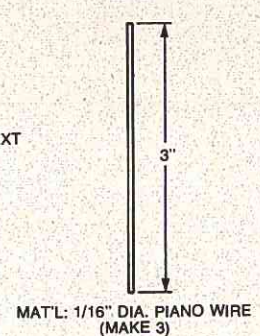
FRONT SKI



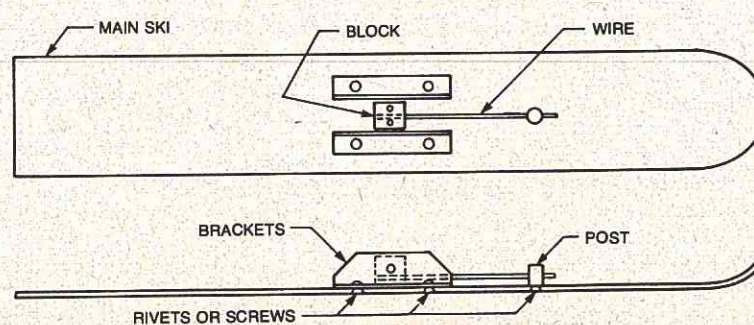
POST



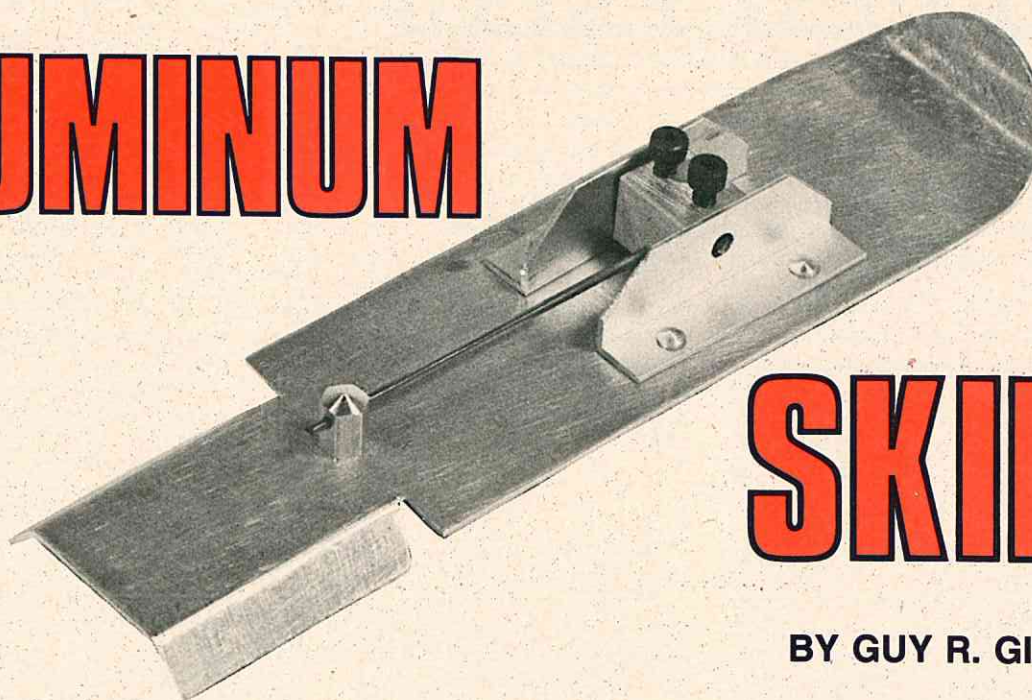
SPRINGS



ASSEMBLY



YOU CAN BUILD A SET OF ALUMINUM



SKIIS

BY GUY R. GIANINO

The winter before last I thought I would try my hand at flying with skiis so I first looked around for a pair of skiis to buy but I didn't see anything worth purchasing. I looked through some past issues of modeling magazines, and still nothing hit me, so I thought I would make some "home-brews." I didn't know what the final pair would look like, but I started building.

The few requirements I set out with were: 1) tri-ski configuration to be installed on to my "G-Ray", a scratch-built, slightly modified Lou Andrews "H-Ray"; 2) must be light, and 3) must be simple to make.

I went to the local junk dealer and picked up some aircraft type sheet spring aluminum and made the sheet metal part of the skiis. I wasn't exactly sure what dimensions I should use but, purely by accident, they didn't look too bad. I didn't think that runners would be a good idea on the main skiis because that meant that they would

have to be perfectly in line, or all sorts of trouble would be experienced, so instead of adding runners to the main skiis, I bent in a couple of runners on the front unit. As you can see, the addition of these runners added zero weight. As far as making the skiis movable tip-up and tip-down, I thought I would keep the profile down low for esthetic reasons so, instead of using coil springs or rubber bands, or what have you, I used the system shown on the plans. Making these skiis is really very simple and requires no power tools, however, a drill press would certainly make things a lot easier.

CONSTRUCTION

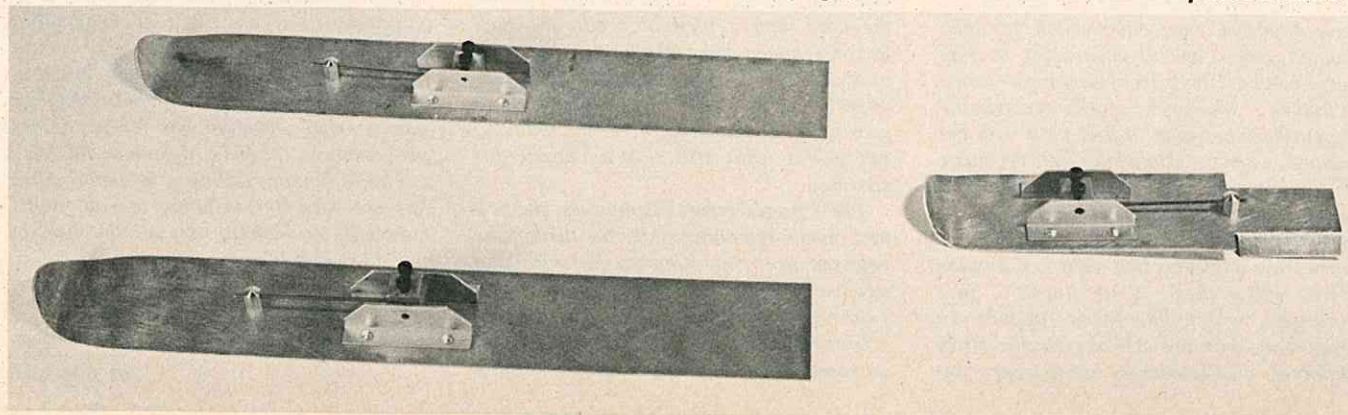
After obtaining the required materials you can commence by laying out the sheet metal for the main and front skiis. Shear, or cut these out, but do not drill any holes at this time. Next make the 6 brackets (4 main and 2 front). Drill the holes in these brackets. The size holes will depend on the

size rivets you use or whether you use 2-56 flat head screws. Now lay out the position of where the forward hole of each bracket will be on the main and front skiis and drill. Assemble the brackets to the skiis. The brackets can now be used as a template for drilling the rear mounting holes. This way the holes will be perfectly aligned and you can be sure that the brackets will be mounted straight on to the skiis. Remember that the size drill to be used for the axle holes must agree with the diameter of the axle wire on your ship. The front ski must have a couple of saw cuts put into it and the runners bent down. I used a vise to put the ski in while I hit the runner with a wooden block and hammer.

Drill the holes in the skiis where the posts will be mounted. The posts can be made out of a piece of 1/4" diameter aluminum rod. The 1/16" hole must be a fairly loose fit for the 1/16" diameter spring wire. The block

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Complete set of lightweight aluminum skiis. Front ski, shown at top of page, is shown behind main skiis in photo below.



SUNDAY FLIER

BY KEN WILLARD

Twelve years ago, Don Dewey asked me to conjure up a column on R/C flying. At that time there were a few acknowledged experts in the field of the radio equipment itself; I wasn't (and still am not) one of them. I did, however, have experience in aerodynamics as applied to R/C, Free Flight, and U-Control, so I said I'd give it a try. But, since I would be a relative duffer in electronics, like I figured the great majority of flyers would be, I named this column the "Sunday Flier" because I figured it would be interesting to the guys who had the same limited knowledge of electronics, but wanted to use the radio to guide their airplanes, and the heck with the details of circuitry. Something like the guys who drive their cars for pleasure, compared to professional drivers, and who had long been known as "Sunday Drivers." I'm not saying that I coined the term "Sunday Flier," but it wasn't in such widespread use as it has come to be during the intervening years.

Then, as time went on, the question of what is a Sunday Flier became obscure — and still is, judging from the letters I've received. But one guy had an answer which, although I didn't think it really described the "beast" as Dr. McCracken called us, it certainly was direct and to the point. Here's Jack Hunnell's opinion:

Dear Ken:

The term "Sunday Flier" can mean only one thing, a person who flies only on Sunday, and if you or anyone else flies on another day of the week, he or she cannot classify his or herself as a Sunday Flier. What I think "Name Withheld" was trying to say, and not too successfully, is that you, along with most people writing articles for a magazine on any subject with the authority and professionalism required by publishers, fall into the category of professional or semi-professional, than do the everyday run of the mill R/C flier. Now that you have read this far, if in fact you have, let me get to the real reason for this letter. Why in the world do you waste space in a good R/C magazine, which has only limited space, due to advertising to stay alive, with a letter from of all things "Name Withheld," who has no more interest in the magazine other than to find fault with the writers, when you could have used the space to answer a question concerning the sport itself. If you and the butcher want to get into the childish game of name calling, or answering questions like what is a Sunday Flier when there is no answer, just opinions, which like faces, appear on everyone, but are always just a little different, then let him fly out to where you

are, (and I'm sure he can afford it with the price of meat what it is), and you and him just go at it, but in the meantime fill your space in the magazine with your knowledge and experience in answer to questions by us, not so dexterous R/C fliers.

I'm sorry my first letter to you had to be this one but that "Name Withheld" and "What is a Sunday Flier" sounded more like something you would read in Dear Abby than in a great R/C magazine. Why not give a years subscription for something worth while?

Very sincerely,
Jack D. Hunnell

Well, I don't agree with you, Jack, but there probably are a lot of guys that do.

And here's another letter — on another subject — where the writer doesn't agree with me. Robert Herzog, a Level III LSF flier, writes from Belgium:

Dear Ken,

Reading your "Sunday Flyer" column in the October issue of R/C Modeler, the more I read, the more I realized I deeply disagree with your judgement of the FAI three task program. I felt I had to react about this and tell you my advice about this.

The advice I want to express is not only personal, it is also the one I could get from many fellow competitors from my own country and a few neighboring ones (Netherlands, England, Germany and France).

During 1974, I took part in 4 three task contests and got the feeling that the more I did it, the more I liked it, and I presently really enjoy it very much.

Your major objection seems to be against the speed event. I agree this is not the best of the three tasks, but I feel that it is a good part of the program, where badly built models (uneven washouts, sloppy wing fixings, etc.) really show their vices, and where piloting ability has to show up somehow.

About the duration event, I will say I still find it very demanding, but as will always be the case with a thermal event, the luck factor remains big, which is a bad, but unavoidable, thing. This luck factor is happily outbalanced by the rather high scoring of spot landing; here, the unlucky, but good, pilot still has a chance for scoring.

The distance event is in my eyes, the best and most demanding of the three; the reasons are: you have to fly with and against the wind, and not crosswind, so that some minimal forward speed ("penetration") is a prerequisite to complete the upwind legs; you get 4 out of

the eight minutes to eventually look for and take profit of a thermal **before** beginning the actual distance runs. This fact introduces a very interesting tactical factor which the good modeler will and shall have to take into account; good piloting is of great importance, so as to fly as straight a course as possible, and to turn at the right moment (anticipating somehow the flagman's signal to initiate the turn).

Maybe with the three task event, soaring will no longer be a beginner's event, but I think it is of such interest as to attract many keen modelers looking for a highly competitive and technologically attractive category, devoid of all pollution problems.

In fact, we, soaring enthusiasts, are following the tracks of full size gliders, where modern developments are towards high performance sophisticated machines, able to cope with many more atmospheric conditions than the gliders from thirty years ago. These gliders were also "thermal soaring" or "slope soaring," unable to fly any pre-determined course.

I feel the most important quality of the FAI event is that it is going to force development of the models, in all of their properties, whereas all other thermal formulas were putting very little accent on model technology (Olympic 99 was always among the winners, wasn't it?) and the luck factor was frequently decisive.

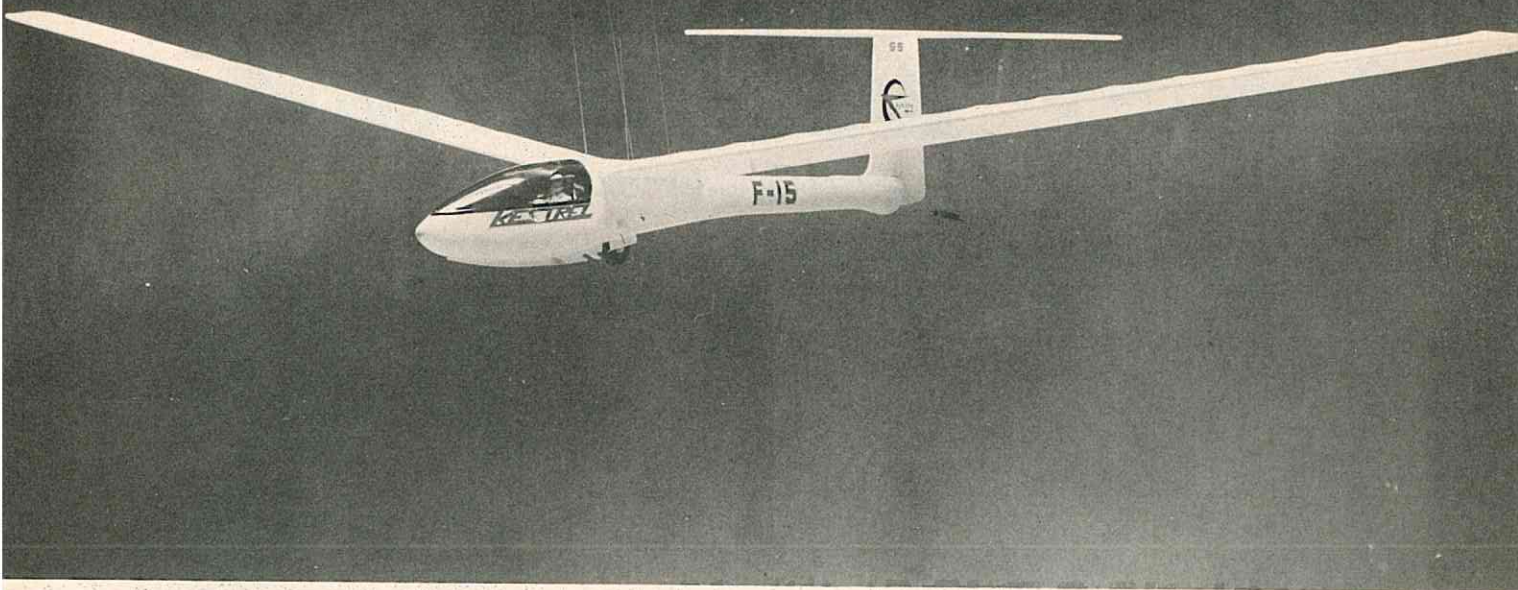
One last point: strong criticism has been expressed against the complexity of the rules, their application requiring "an unacceptably high number of ground helpers." Let me state that my own experience in organizing such a contest has shown that a grand total of 7 people is all that is necessary to fly up to 3 full rounds (total of 9 tasks) on a single day with 20 competitors or less. The same number of helpers is sufficient to fly one full round a day, with as many as 60 competitors. The people who helped me were not specially trained for this; they were just simply willing to help.

Anyhow, if the three task formula is kept for next years, some duration only contests can always be organized for less demanding or less proficient modelers, but one should recognize the real value the competition in more complex and difficult conditions than pure thermal duration has for the future progresses in the field of soaring models.

I hope that the reading of my bad English has not been too irritating to you, and I conclude by wishing you all the best in modeling and life.

Friendly yours,
Robert Herzog LSF 095, Level 3
Eppegem, Belgium

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SOARING

BY JIM SIMPSON

Before reading further in this column, please, if at all possible, go back to your October 1974 issue of RCM and review the Soaring Column therein. As stated in that column it is now Winter time and you won't lose valuable practice time by tending to necessary political matters because it is a long time until good flying weather for many of us!

Next, please notice the emphasis placed on the word positively!! as it appears in paragraph 3. Folks what I'm saying is that **now is the time to take positive political action!** I mean right now, this very minute; and I mean **positive** not negative. If you are thinking negative, please write to someone else because we here at RCM are too busy building up the kingdom of Radio Control to bother with tearing something, someone, or someplace down. Can you dig it?

I'm writing this column on the first of December and hopefully you will receive it about the first of February. As most of you read it the snow will be deep on the ground, hockey season will be well underway and you'll be going stir crazy looking for something to do. Please help by **positively** doing the following right now:

1. Pull out your wallet and review your AMA license. Is it for 1975? If not, then write for it.
2. Is your FCC license up to date? If not, then renew it.
3. Is your LSF card next to these? If you

don't have an LSF card and you do have a sailplane then please write to the LSF, P.O. Box 39068, Chicago, Ill. 60639. Enclose 25 cents in stamps or coin and submit your declaration of intent (as previously printed on page 12 of the same issue of RCM) to affiliate with this outstanding organization.

4. Is your National Soaring Society (NSS) card current for the year of 1975? If yes, then you are an exceptionally active and most appreciated Soaring Enthusiast. If no, then please read on because we really need you and your support in the coming years.

As many of you may already know, the National Soaring Society was officially accepted as the national organization for soaring. Immediately following that there were six interim appointments made to cover the nation with representatives. Quickly following these appointments were the national elections and just a few days after the results of these elections were published, the annual board meeting was convened in Washinton, D.C., by the outgoing President, George Durney.

One of the last items on the agenda of this board meeting was the election of officers for the ensuing year. It is my pleasure to report to you that the ever popular and most capable Rod Smith of Mark's Models fame was elected President. Yours truly was elected Vice President. Rod will appoint a

new secretary and treasurer and various committees throughout the coming year. There are many exciting events being planned right now which you will hear about as time goes by.

The key ingredient in this whole recipe is **you!** As a single individual you may make or break this newly constituted body. If you elect to withhold active support it will not grow — so, to paraphrase a famous recent president of our nation — ask not what your Soaring Society can do for you but rather what you can do for your NSS!

The first thing you can do is join immediately. The second thing is to urge **every one** of your buddies to join. After every one you know who is even remotely interested in R/C Soaring has joined then the next step is be active. First, fly in as many contests as possible and encourage the directors to sanction the events through NSS. Second, make positive constructive suggestions on how to improve the organization. Third, volunteer to work hard in events and on committees to make it go because it is **your** organization. If you have a special talent or access to essential elements (computer, press, loose money, legal advice, machine foundry, flying sites, etc., etc.) come forward and volunteer the same.

The task ahead of us is a formidable one but not unsurmountable. Further, it will be downright easy to accomplish if every single one of you will help. So do your part. **Join, get others to join, fly, fly, and work!**

Coming next month is the first of a series on the big open class Exotic Sailplanes and various aids such as R/C releasable towhooks, water ballast, and the much misunderstood Thermal Sniffer. □



QUARTER MIDGET

BY DON DOMBROWSKI AND FRED REESE

DON DOMBROWSKI



● In the January issue we discussed the problem of profile canopies and profile cheek cowl as a way to streamline a racer yet still appear to have the same scale outline when viewed from the top and sides. We had heard some statements that this type of model was showing up back east and, to the chagrin of some, had won some races. Here in sunny Southern California we had not seen this as a problem as the Quarter Midget Racing Club has consistently since reaffirmed its position of not allowing "trick" airplanes to compete in QMRC sponsored races. It was, therefore, very alarming to the Calif. flyers, and to others, when they arrived at the Winter Nats in Tucson, this year, to see diamond cross sectioned fuselages with thin profile canopies and only one cheek cowl on the engine side like a UC speed model. These models bore little resemblance to the racers they claimed to be and were protested. Bob Angus, the Contest Director, upheld the protest and the airplanes in question were not allowed to race. This action took great courage on Bob's part as these people were from his own club and he was certain to face a lot of criticism after the contest. It is unfortunate that this incident spoiled, for some, an otherwise good contest. When people bend the rules they should not be surprised if they are not allowed to compete.

I feel somewhat responsible as I set a precedent with my Cassutt racer published in RCM and since modified and kitted by Hot Line Models. Several other simple designs were published by RCM and Model Builder all with profile cheek cowl. All of

these designs were done at a time when it seemed more important to get people flying and racing small airplanes rather than to possibly scare them away by showing more complicated fully cowled engines and complex lines. Again, it did not appear to be a problem as the Cassutt I designed four years ago is obsolete by most standards and not really competitive with current designs, in fact, we rarely see one anymore. Since then I have changed my mind and feel that scale features should be retained in a manner that more reasonably resembles the full size aircraft. In no way do we want, or would we suggest, scale judging as a solution. The people in Formula I are facing this problem now. Scale judging is only relevant to the other airplanes being judged and not to the full scale counterparts. We do want to maintain the scale aspect of racing as there are other non-scale events available such as FAI, Quickie 500, Tadpoles, or even Quickie 200's for Half-A Racing. As it now stands there is really only Formula I and Quarter Midget where a person can compete in scale type racing. I realize Formula II is a scale event but it is raced in only a few parts of the country. Half-A racers must resemble full scale racers, but it is pushing a point as only constant chord wings are allowed in most areas.

The rule regarding model aircraft requirements for Quarter Midgets in the 1974-75 AMA Official Model Aircraft Regulations does not appear to be adequate to maintain the scale aspect. Consequently we feel that some rewording could prevent future incidents like Tucson. The rule could be stated: *Models entered in this event shall be semi-scale replicas of propeller driven aircraft that have competed in closed course, speed record attempts, or cross*



FRED REESE

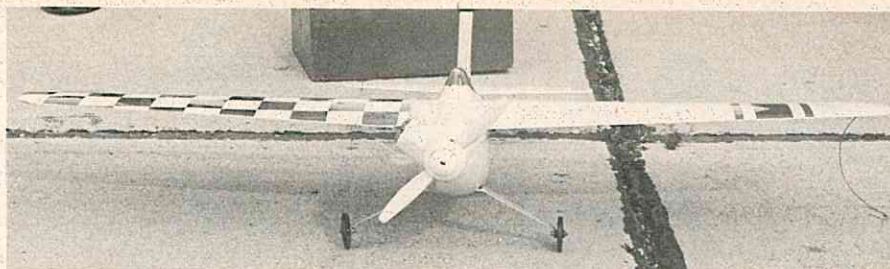
country racing and be recognizable in all three-views, front, side, and top. No Deltas and or tailless type aircraft shall be allowed. In the case of unusual or little known designs, the flyer shall produce, if requested by the CD, documentation consisting of photos and a three-view drawing from a reliable source such as the manufacturer, model or aviation magazines, books, or commercially available three-views to verify that such a plane or special design did exist.

The rewritten rule, above, is not really different from the existing rule for the modeler but does give the Contest Director more definition in the event of a protest. We feel that it would be difficult to write an official rule that would cover all contingencies as some definitions are vague. The words "semi-scale" and "recognizable replicas" leave room for many interpretations which leads us to

RESULTS			
Place/Name	Airplane	Eng.	Prop
1 Tom Prescott	LR1A Own des.	KB	7/6 Tornado
2 Jack Stafford	Stafford P51	KB	7/5 TF Narrow pylon
3 Dale Yaney	Stafford P51	KB	7/6 Rev Up 400
*4 Joe Zdzankiewicz	Dara prototype	ST	7/5 Rev. Up 400
	House of Balsa kit		
5 Ivan Munninghoff	Old Tiger own des.	KB	7/5 Power Prop
6 Jack Aycock	Rickey Rat	KB	7/5 Power Prop
	House of Balsa kit		
7. Ramzi Thomas	Stafford P51	ST	7/6 Rev Up 400
8 Nick Nichols	P-39 own des.	KB	7/6 TF Narrow pylon
9 Mike Cooke	Stafford P51	KB	7/6 Rev Up 400
10 Al Shepard	Dara own des.	KB	7/5 Rev Up 400

*Fastest time of the meet was by Joe Zdzankiewicz. His time of 1:37.3 resulted in a remeasurement of the course which was found to be 400' long instead of the official course as advertised.

Models entered in this event shall be semi-scale or recognizable replicas of propeller driven aircraft that have been designed for, or have competed in closed course, speed record attempt, or cross country racing. No deltas and/or tailless type aircraft shall be allowed. In the case of unusual or little known designs, the flyer shall produce documentation to verify that such a plane or special design did exist. AMA Rule Book.



ABOVE, LEFT: Bill and Billy Hempel, age 9, from Tucson, flying a Fibrefoam Miss Dara powered by ST and using 7/6 nylon Tornado props.

ABOVE: Al Shepard and his son Adrian with Al's scratch fiberglass Miss Dara and Adrian's Stafford P-51. Both use K & B engines and 7/5 Rev-Up Series 400 props.



LEFT, L to R: standing: John Anderson, Ron Timroth, Jack Cole, Ed Pompea. **BOTTOM:** Ivan Munninghoff, Jack Aycock. All are members of the Pikes Peak RC Club of Colorado Springs and came a long way for this contest.



Tom Prescott, the winner, with his own fiberglass and foam original LR1A powered by a K & B and using Tornado 7/6 nylon props. Tom was fast and consistent through the 6 rounds. LR1A will be a future kit.



Bob and Pat Adams and another House of Balsa Miss Dara prototype. Super Tigre power and Rev Up Series props. Kit will be released early this year.



Joe Zdankiewicz and caller John Elliott with prototype House of Balsa Miss Dara which set the fastest time of the meet at 1:37.3. Joe uses a Super Tigre and 7/5 Rev Up Series 400 props.



Nick and Norma Nichols and original P-39. They were tied for 5th until the last round when he hit a pylon. K & B power using 7/6 Top Flite narrow racing prop.



Tony Di Padova and wife, Angela, from Riverside, California, with their West Coast R/C Miss RJ powered by K & B using Top Flite 7/6 narrow racing prop.



Bill Cranston and Jay Callahan from Phoenix with Miss Dara prototype. Super Tigre and 7/6 Rev Up prop.

believe that a CD guide should be written covering this and all other aspects of running a race.

In the last three years the only features of the airplane that have caused any controversy were the cross sectional front view of the fuselage, canopy, cheek cowl and air scoops on Mustangs. For example, a possible guideline for a CD regarding cheek cowl would be that the purpose of cheek cowl on the full size aircraft is to cover the engine to reduce drag. If the documentation shows the original airplane with cheek cowl, the model also should have cheek cowl. The cross sectional area of the cheek cowl should approximate the protruding portion of the engine cylinder and head and the opposite cowl should be of the same size.

Aside from the protests, counter protests, and assorted bickering between factions, the racing was good and the people had a good time at Tucson. The events were well run and handled efficiently although spreading three events over three days made it a long weekend with a lot of waiting

unless you flew in more than one event. There were sixty-nine entries in QM and six rounds of flying were spread over the three days along with the Pattern and Stand-Off Scale. Several of the entries were participating in their first large race and there were a large number of husband-wife teams and father-son teams entered. It was interesting to see the sons often out-flying their fathers.

Our hint and new product of the month is the same. The product is Sattelite City's Hot Stuff glue. Unlike most of the cyanoacrylate glues on the market, Hot Stuff is designed for wood and other porous materials. A tiny drop will bond two pieces of wood together permanently in about 10 seconds and the joint is very strong. Hot Stuff will not span gaps or make a fillet of its own but, where a fillet or completion of a joint is needed, pack in some balsa dust or micro balloons and then drop Hot Stuff on the joint. It will smoke and cure immediately. At the last couple of races we have seen incredible rebuilding jobs on wrecked racers in

minutes that would otherwise have taken hours even with 5-minute epoxy. Hot Stuff can be used for total construction or field repair. It will bond plastics, metal, wood or rubber products. Complete information regarding use and cautions are included in the package. Two 15 Gram bottles with capillary applicators sell for \$8.00. Only tiny drops are required for bonding making the cost comparable with other adhesives.

This month's interview is with 27 year old Dan Kane from Chicago. Dan was one of the people instrumental in the forming of the Chicago Pylon Club and was the club president in 1973 and '74. Dan has traveled extensively to Quarter Midget races in other parts of the country. We first met two years ago in Kentucky at the Quarter Midget Nationals held there and he has since been twice to California for the two day meet in Chula Vista. He has also traveled to Indiana, Ohio, Illinois, Tennessee, Michigan and Iowa to race.

Dan started R/C at age 13 racing Class C to page 78

The subject of this month's interview is Dan Kane. Dan was most instrumental in the forming of the Chicago Pylon Club.

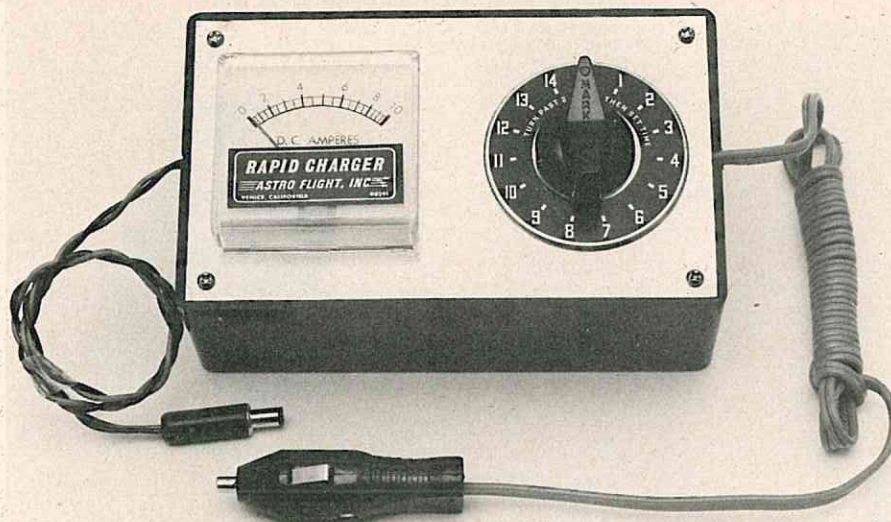


Don Dombrowski, himself, proving he really does fly. Photo taken at 1974 Tucson Winter Nationals.



QUIET REVOLUTION

BY ROLAND BOUCHER



Astro Flight's Rapid Charger, designed by the author. This unit is the subject of this month's discussion.

Welcome to the quiet revolution. This column is dedicated to those modelers who enjoy electric flight and want to share their experiences with other electric fliers; and especially to those of our readers who have considered electric power but who weren't sure just how to go about it. In order to accomplish this objective I have organized this column into three sections. The first will contain news items obtained from our readers, or by the author at flying sites in Southern California. The second section will discuss some technical aspects of electric flight about which those of us who are old hands never give a second thought but which are important to someone who is about to join the quiet revolution. The third section will contain questions from our readers which I will answer to the best of my ability. I have always enjoyed reading Engine Clinic by Clarence Lee and if I can do half as well as he does in helping you with your motor problems I will consider this column a success.

ELECTRIC NEWS

The Flight Masters Annual Scale Contest was held on Oct. 6 and 7 1974 and contained quite a few free flight electric entries. This year's winner was Bill Warner with his "Le Petit Brochette" powered by a Mattel power unit. A new Astro Flight prototype .020 power plant was demonstrated by Addie Mae Nacattaro in a 54" span Aeronca Chief. Unlike the other electrics entered, which never gained over 50' altitude, then descended while still under power, Addie's Chief climbed to over 600' on a timed 45 second motor run. This new power unit will be the subject of a future news report. This month's news section is quite short because I need reader input. Please send me news items — electric contests, club activities, new electric designs — anything that shows what is happening in the world of electric power.

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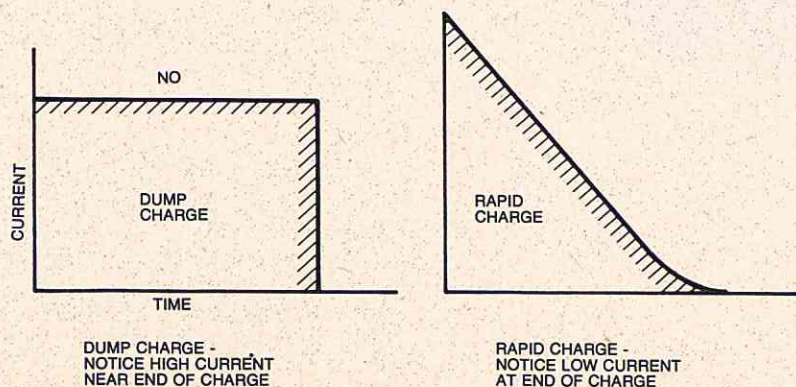
Now we will discuss the **one technical aspect** of electric power which is by far the

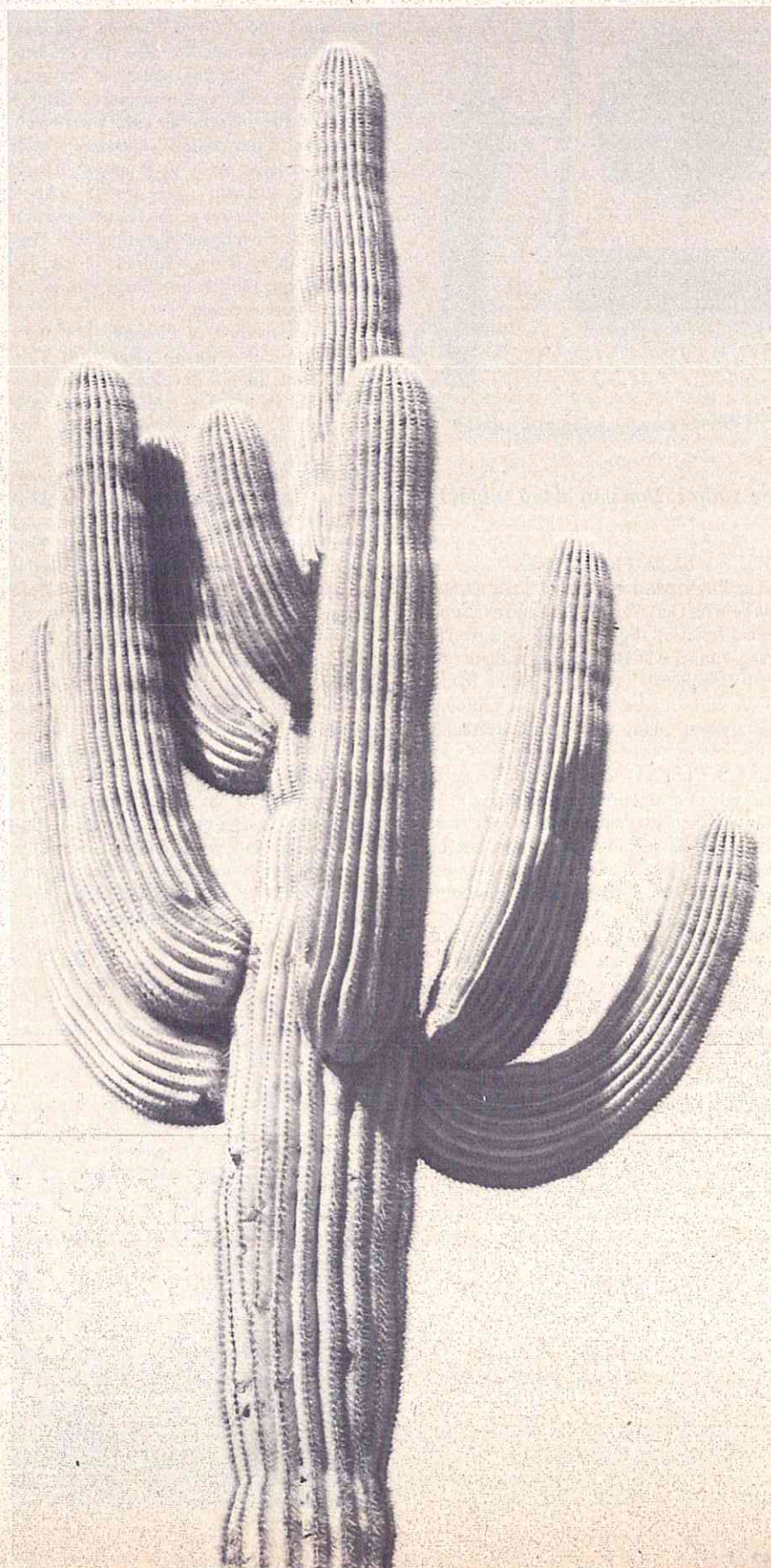
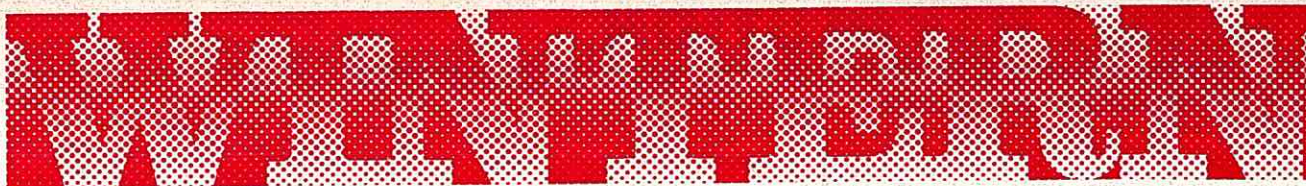
most controversial, *rapid battery charging*. In order to make electric flight a practical reality, rapid charging of the motor batteries is an absolute must. Many of us are familiar with the nickel cadmiums in our radio receivers and transmitters. They are charged at a 10 hour rate and require up to 16 hours to reach a fully charged state. This charge rate is used because it is the maximum rate (current) which will not permanently damage the cells if continued indefinitely. While this method of charge is safe it is not satisfactory for electric flight. Some of the battery manufacturers sell so-called "rapid charge" batteries which can be charged in 3 to 4 hours. These batteries contain ingredients which recombine the gasses generated during **over charge** and prevent gassing of the cell. This type of battery is not required for electric flight and the 3 to 4 hours charge time is not a useful improvement.

Another method of charging a battery rapidly is called **dump charging**. This method was highly developed by Hughes Aircraft in its tow anti-tank missile. In the tow the sub-C cells, which power the missile electronics, are charged in seconds just prior to launch. This method works because a nickel cadmium battery is like a water pitcher. It can be filled at almost any rate so long as it is never over filled. This "dump charge" method can only be used if the battery is completely discharged before recharging; otherwise there would be no way to prevent over charging the battery. This dump charge method is used in the Mattel Super Star and in the Galler Alpha power unit. It works well but has two drawbacks when it is used in R/C electric planes. Unlike free flight the R/C enthusiast will normally land his plane by shutting down the electric motor before the battery is completely discharged; he may then abort his landing and go around if necessary. After landing he has no way of telling what the state of charge of the batteries are. With the dump charge you would have to run the

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Addie Mae Nacattaro with electric powered Aeronca Chief.





BY DICK TICHENOR

They did it again!

The Tucson R/C Club, as hosts for the Seventh Annual R/C Modeler Magazine Winter Nationals, pulled off another superb contest. Adjectives just will not do justice, as accolades due that hard working group led by Tucson Club President Bill Pernett.

Bob Angus was the decision making Contest Director. Chuck Taylor was Chief of Contest Administration, ably assisted by his vivacious wife Helen. Their contest efforts started early in 1974 and the follow-up continued on to the end of the year. Along with those loaded with the administrative responsibilities, we want to express our sincere appreciation to the dozens of club members, their families and friends who worked so hard and long to make the Winter Nationals one of the best R/C contests in the world.

Significant to the success of any contest are the members of the model industry whose generous donations of prizes would otherwise be beyond the financial capability of any large meet. Various manufacturers and their representatives attended and participated. If they compete and win, that is beside the point, the modelers have the opportunity to see the best products available and what they will do while the industry is able to expose their wares and survey the potential market. Our deepest thanks to these manufacturers for their support.

The 1974 Winter Nationals was probably the most sophisticated large open contest ever held. The models entered in all three categories were extremely well constructed and finished. Practically all the pattern ships were of the high performance competition type featuring retracts, spinners, etc. Scale models were remarkable with their finish, details and markings, and were most competently flown. Quarter Midgets displayed the pride of workmanship and

AUTOMOTIVE



attention to the details necessary for potential winners. Electric starters, fuel pumps, electronic tachometers and numerous other goodies were almost standard equipment in most flight line boxes. A major portion of the contestants entered two events and many entered all three.

Another interesting point was the number of younger fellows competing with extremely well built aircraft and their scores let their seniors know they were definitely in the contest.

A bit surprising was that Class D Expert did not dominate the meet as it usually does. With flying starting at 7:30 AM and six flight lines operating, Pattern flyers had no problem getting in all their rounds. The judges were well qualified and were consistent in their scoring.

Dave Brown, representing World Engines, repeated his 1973 Championship performance by taking 1st Place in Class D Expert. Dave went on to win the sudden death fly-off for the Grand Championship under the pressure of an outstanding flight

by Ivan Kristensen, Canadian National Champion from Guelph, Ontario. Ivan placed 2nd in Class D. Steve Buck was 3rd in this category and, unfortunately, lost his engine during his fly-off flight. Even though the final score officially determines the winner, all three of these gentlemen are indeed Expert Champions.

In all the pattern classes, one only had to observe the caliber of contestants and aircraft to conclude that pattern competition is very much alive and that there is plenty of championship talent in the offing.

EVENT WINNERS

GRAND CHAMPION

Dave Brown

PATTERN CLASS D EXPERT

1. Dave Brown
2. Ivan Kristensen
3. Steve Buck
4. Joe Bridi
5. Bill Salkowski

PATTERN CLASS B

1. Ron Gilman
2. Duane Sides
3. Dick Schofield
4. Dick Russ
5. Bill Hempel

SPORT SCALE

1. Bill Hempel — Chipmunk
2. Bob Thacker — P-82
3. Dick Schofield — P-63
4. Bud Atkinson — E33 Bonanza
5. Jack Aycock — B-24

PATTERN CLASS C NOVICE

1. Jack Strickland
2. Bill Cranston
3. Rusty Van Baren
4. Bernie Workman
5. Bill Simpson

PATTERN CLASS A

1. Mike Bailey
2. Rick Mattie
3. Eugene Serrano
4. Robert Shaw
5. Rick Davey

QUARTER MIDGETS

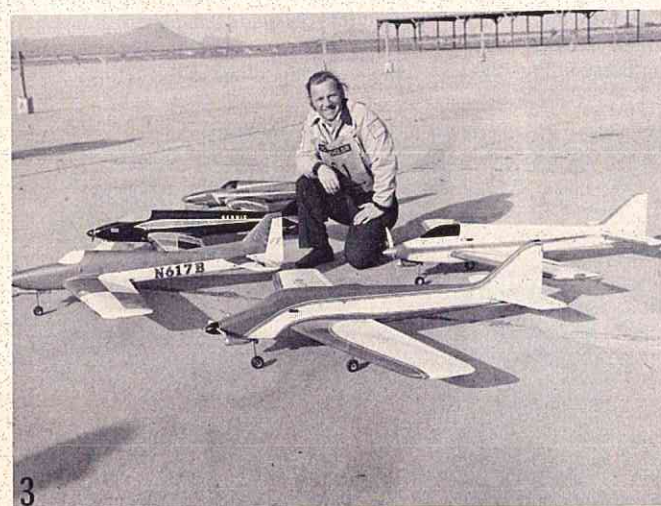
1. Tom Prescott
2. Jack Stafford
3. Dale Yancy
4. Joe Zdankiewicz
5. Ivan Munninghoff

TOTAL ENTRIES

Class D	16
Class C	9
Class B	18
Class A	42
Sport Scale	33
Quarter Midget	69
Total	187

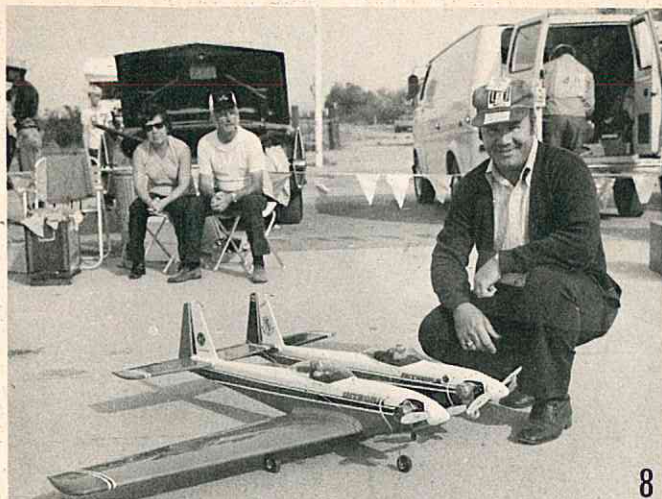
**DAVE BROWN
GRAND CHAMPION**





(1) Canadian National Pattern Champion Ivan Kristensen from Guelph, Ontario, placed 2nd in Class D Expert, assisted by his wife Dianne. His original designed Saturn to be kitted by Fliteglas Models.
 (2) Class D 5th Place was Bill Salkowski of S & O Radios with a Super Cuda, assisted by Frank Capan.
 (3) Champion Dave Brown from World Engines won with his Phoenix, a Don Lowe design. Here are a few of the Phoenix entered.
 (4) Billy Hempel was the youngest contestant. A veteran at 9 years old he entered Class A with his Ross powered Sicrol - also raced Quarter Midgits.
 (5) Steve Buck was 3rd in Class D with his T-2A. Steve represented Kraft Systems.
 (6) Beautiful pair of T-2A's flown by Keith Davidson (left) and Ray Floyd, members of the Chula Vista, California RCC.
 (7) Joe Bridi flew his new "Dirty Birdi" to 4th Place in Class D.





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(8) Dick Russ of Allied Hobbies won 4th in Class B with his Integra. Here are two Integra fuselages sitting on one wing as a joke.

(9) Arlene Anglikowski shows off her hubby's flaming Kopy Kat.

(10) Jerry Hunsicker with his super clean Super Cuda. Jerry also entered Scale.

(11) Bob Boucher of Astro Flight flew his twin electric powered in Class A. The quiet job was impressive.

(12) One of the six ready lines that made an efficiently run contest.

(13) Steve Sica is one of the talented youngsters who are giving the older guys a run for their money in Pattern and Racing.

(14) Hardy Benson shows off his Bushmaster powered by an Astro 25 electric motor. Benson Hobby Products built the SC-2H speed controller for electric jobs.

(15) Carl Goldberg (right) observed the Winter Nats with his field rep. Bob Rich.



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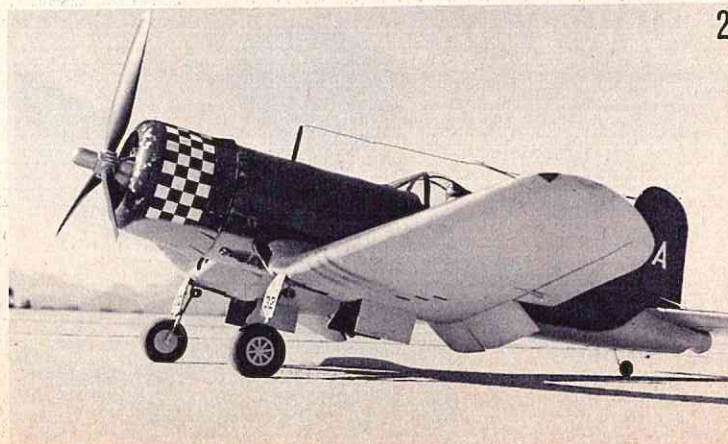
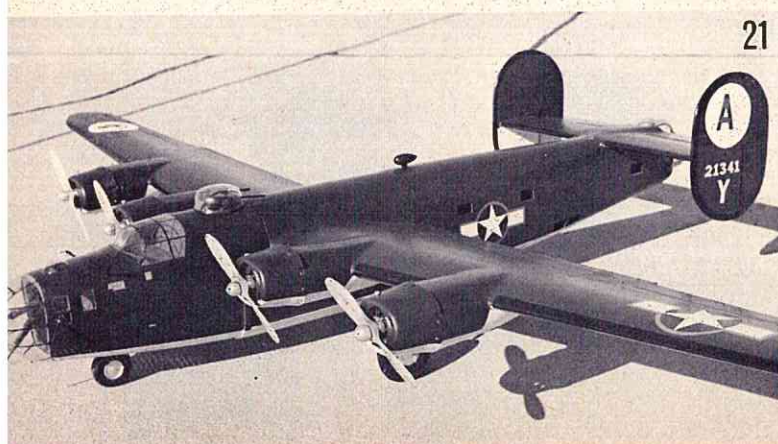
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(16) Leader of an active modeling family, Bill Hempel took 1st in Scale with a beautiful scratch-built model of Art Scholl's Chipmunk. Also flew Class B.
 (17) Col. Bob Thacker was really in command of his P-82 to take 2nd in Scale. His low inspection pass was flown at less than a foot off the runway.
 (18) This slick P-63 took the 3rd Place hardward for Dick Schofield.
 (19) Bud Atkinson's outstanding E-33 Bonanza was 4th in Scale.
 (20) Jack Stafford Models was represented by Jack himself. This P-39 Aircobra was his Scale entry.
 (21) Jack Aycock from Colorado Springs, Colorado, had it all together for 5th Place with a Stafford B-24. Contest was Liberator's first flight.
 (22) This remarkable FG-1 Corsair by Kent Walters flew as good as it looks.

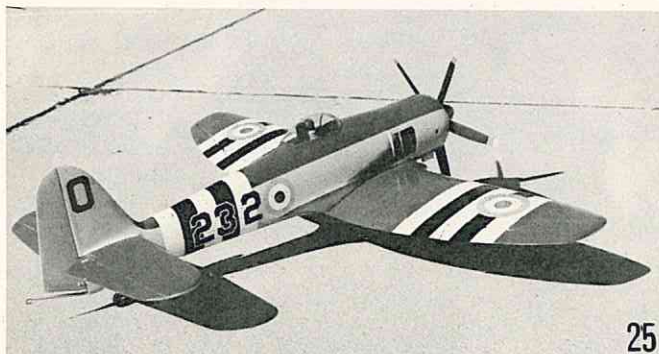




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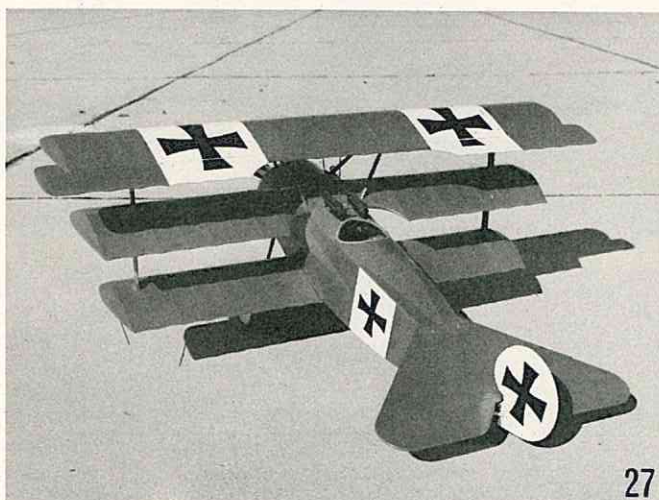
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(23) Bob Boucher flew his electric powered Astro Flite RF4 Fournier in Scale. Electric power really coming on in popularity.

(24) Kent Ferguson flies this F4U Corsair when not crop dusting in his Travel Air 4000.

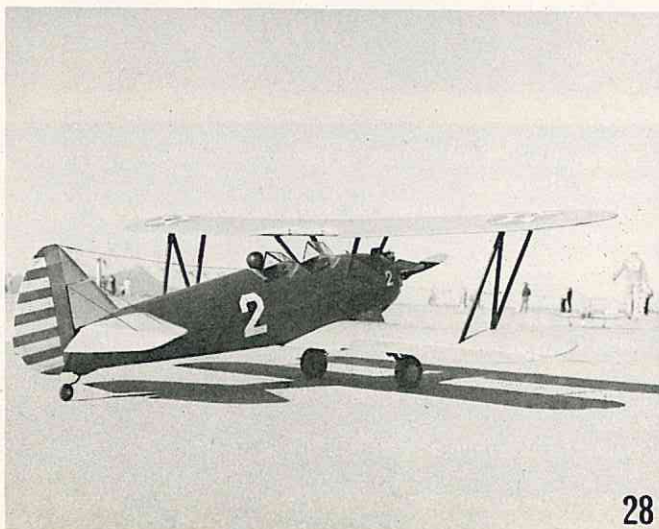
(25) Max Hopkins built his Hawker Sea Fury from a Bob Holman semi kit - flies like a dream.

(26) Joe Bridi's Scale entry was this neat P-51.

(27) Jack Stickland brought his realistic Fokker Triplane.

(28) Can you imagine a Scale contest without a Stearman? Frank Capan brought his.

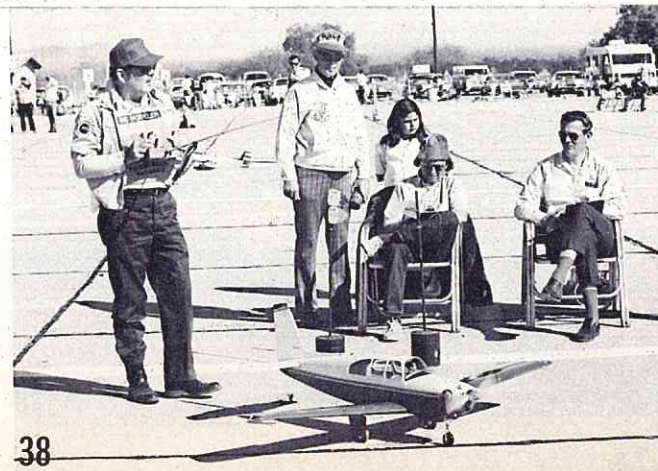
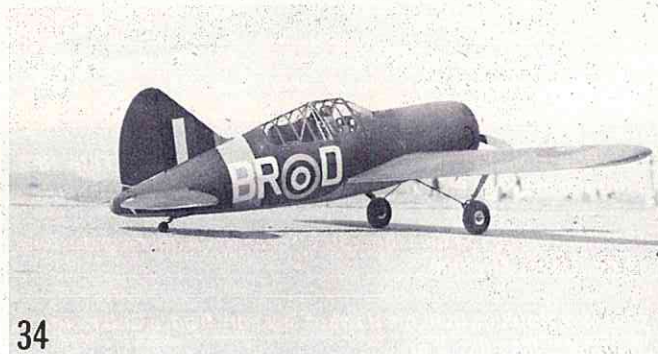
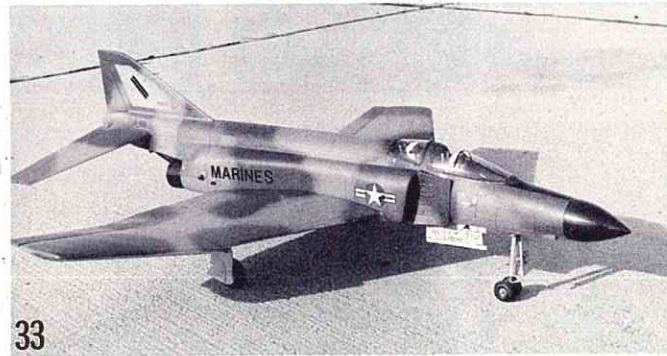
(29) Dr. Wayne Owens entered his P-38, a real crowd pleaser.



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(30) Beautiful FW190 D-9 by Ivan Munninghoff from Colorado Springs, Colorado.

(31) Well executed FW190 by Jerry Hunsicker, Sierra Vista, Arizona.

(32) West Coast Products F4 Phantom was flown by Roman Yerema.

(33) Superbly detailed F4 entered by Phil Garrard. Flight number 113 on this Phantom was made at the contest.

(34) Don Williams unusual entry was a Brewster Buffalo.

(35) Mooney executive is a Hot Line Models kit built by Leroy Mattar.

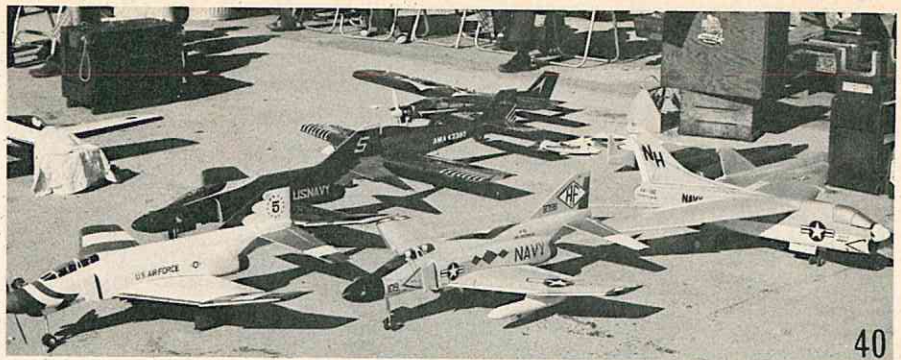
(36) Dave Linne enters Scale each year. This time it's a Sig J-3 Cub.

(37) Bert Baker entered this beautifully finished T-28 from a Dave Platt kit.

(38) Bud Atkinson's E-33 Bonanza ready for take-off.



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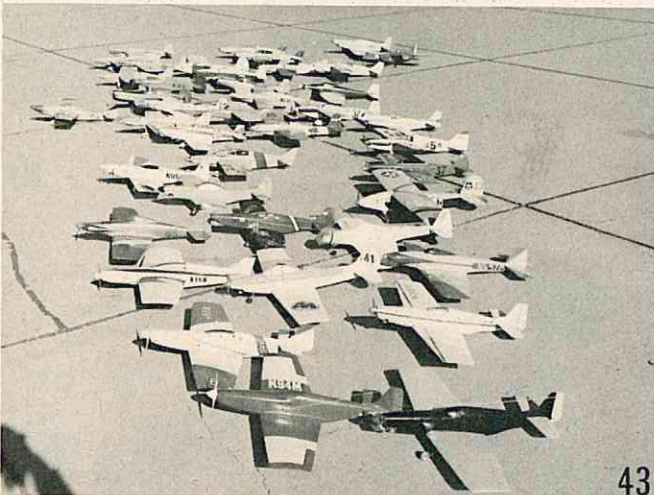
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(39) Here was a thrill for Corsair fans.

(40) A bunch of West Coast Products birds.

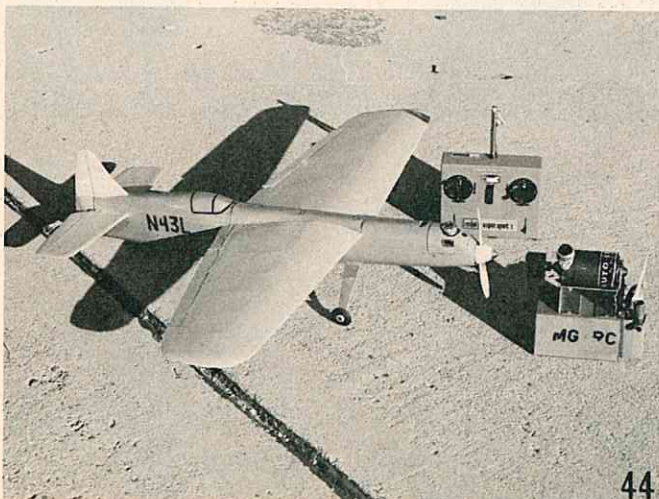
(41) No, friends, this is not Bob Rich's super clipped wing speed job, it's a very effective demonstrator for the Goldberg retractable landing gear. Bob is field representative for Carl Goldberg Models.

(42) The tedious line for Quarter Midget initial processing.

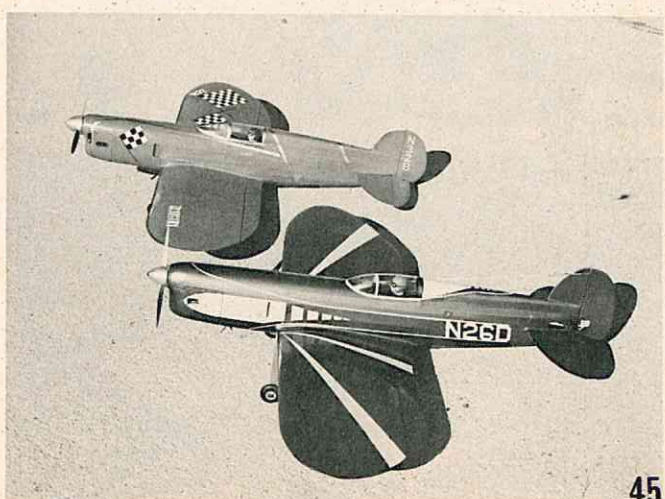
(43) About half of the Quarter Midget entries.

(44) An interesting Mr. Smoothy by Wayne Lawrence.

(45) A pair of very competitive Brown Specials by Wally Davidson and Don Barton.



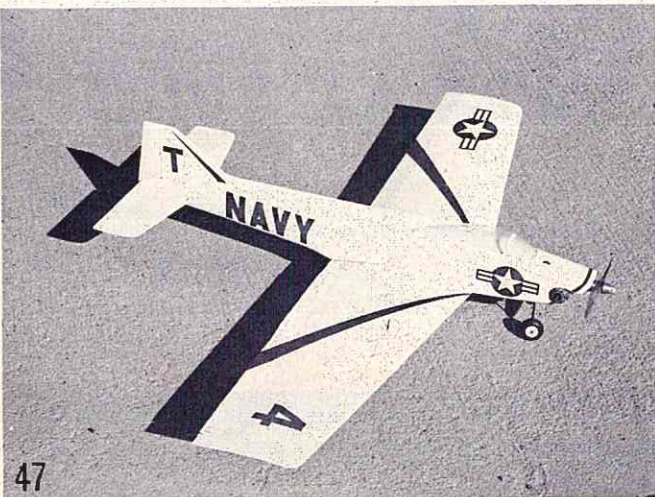
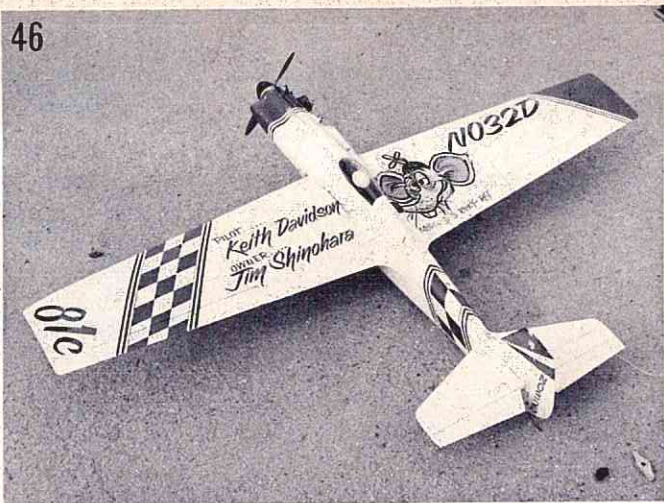
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(46) Any doubt about this Rickey Rat team? A House of Balsa kit.
 (47) Jack Stafford Models introduced the Tom Kitty, for sport or as a Quarter Midget trainer.
 (48) Roman Yerema is happy to see all these West Coast Products Mustangs entered.
 (49) Ed Pompea checks the K & B fuel system in his House of Balsa Rickey Rat.
 (50) Lt. Col. Jack Dech doing it to his Spirit of St. Louis.
 (51) Tom Christopher holds the current National Competition fast time record of 1:48.7. Note the inverted Horner tips. K & B powered House of Balsa Miss Dara.
 (52) Joe Zdankiewicz placed 4th and had fastest heat time of 1:47. House of Balsa Miss Dara and Super Tigre engine. Orbit's John Elliott called.

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(53) Mark McKenna pumps fuel into Mike Cooke's Stafford Mustang.

(54) Typical starting line action was repeated many, many times.

(55) Bob Root's call girl is his wife Kathy.

(56) Don Barton and Wally Davidson bearing down.

(57) One of many close ones.

(58) CD Bob Angus watches administrative chief Chuck Taylor straighten it out with flight line director Dave Lyons on bike. Note the portable PA system on bike.

(59) The expensive silver was well guarded by Tucson lovelies Laura Barnett and Brenda Hinton.

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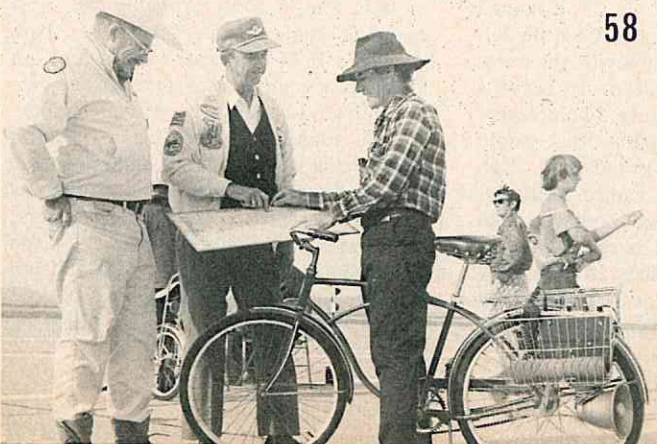
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(60) Pattern D Expert winners: (Left to Right) 1st, Dave Brown; 2nd, Ivan Kristensen; 4th, Joe Bridi. 3rd, Steve Buck and 5th, Bill Salkowski left prior to awards.
 (61) Pattern C winners: (Left to Right) 1st, Jack Strickland; 2nd, Bill Cranston; 3rd, Rusty Van Baren. 4th, Bernie Workman and 5th, Bill Simpson left early.
 (62) Pattern B winners: (Left to Right, front) 1st, Ron Gilman; 2nd, Duane Sides; (rear) 3rd, Dick Schofield; 4th, Dick Russ; 5th, Bill Hempel.
 (63) Pattern A winners: (Left to Right) 1st, Mike Bailey; 2nd, Rick Mattle; 4th, Robert Shaw. 3rd, Eugene Serrano and 5th, Rick Davey, left early.
 (64) Quarter Midget winners: (Left to Right, front) 1st, Tom Prescott; 2nd, Jack Stafford; (rear) 3rd, Dale Yaney; 4th, Joe Zdankiewicz, and 5th, Ivan Munninghoff.



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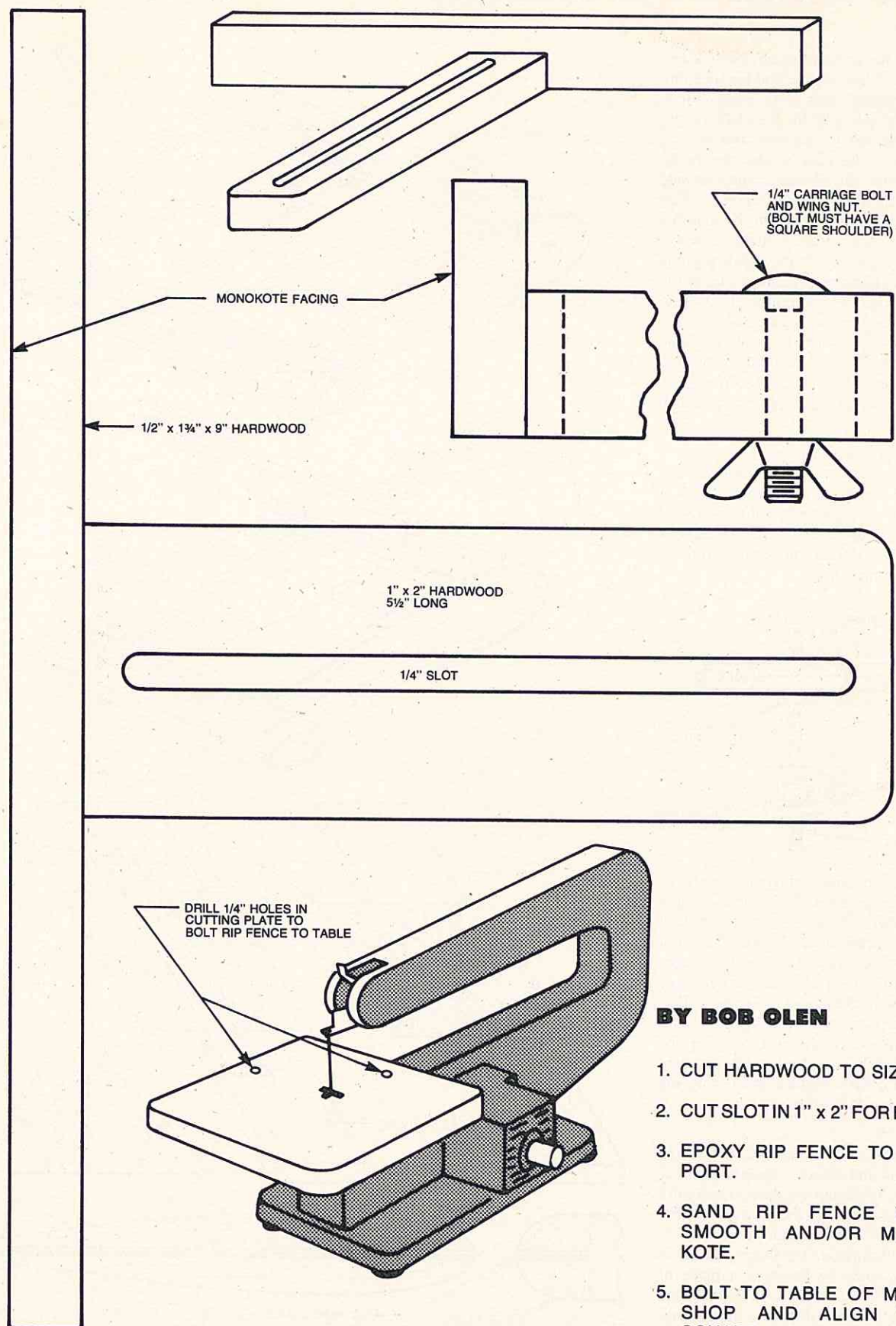
Sport Scale used four flight lines and flew from 11:30 AM to 1:30 PM. A spectacular show was provided by having all the scale ships flown together with four aircraft in the air at one time. Scale has really matured, besides the beautiful workmanship and variety of types, engines started quickly and the pilots were competent. That master craftsman, Phil Garrard, brought his F4 Phantom that had 112 flights logged on it before coming to the contest and its immaculate condition looked as though he had just completed building it the night

before. Bud Atkinson's E-33 Bonanza looked and performed as realistic as the full size prototype. Bill Hempel won the event with his scratch-built model of Art Scholl's Chipmunk. His ground judged points were compounded by flight points that would have made Art Scholl proud. Col. Bob Thacker flew his P-82, named Betty Jo, with the same definitive authority he used when he set two world records with the original full size P-82 Betty Jo. His low inspection pass was a real thrill with both engines screaming and clearing the runway

by less than a foot. Probably the most exciting scale performance was Bob Aycock's B-24 Liberator from a Stafford kit. All four engines were started in less than one minute, taxi and take-off were smooth as silk, maneuvers were clean (no trim adjustments were required) and concluded with a smooth landing accompanied by tumultuous applause from the spectators. This was the first flight for the B-24 and everything worked perfectly. (Jack Stafford smiled a lot, too.) Bob Boucher's electric

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DREMEL MOTO-SHOP RIP FENCE



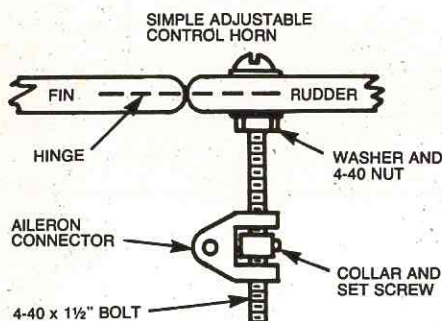
BY BOB OLEN

1. CUT HARDWOOD TO SIZE.
2. CUT SLOT IN 1" x 2" FOR BOLT.
3. EPOXY RIP FENCE TO SUPPORT.
4. SAND RIP FENCE VERY SMOOTH AND/OR MONOKOTE.
5. BOLT TO TABLE OF MOTO-SHOP AND ALIGN WITH SQUARE.
6. PRESTO-CUT

FOR WHAT IT'S WORTH

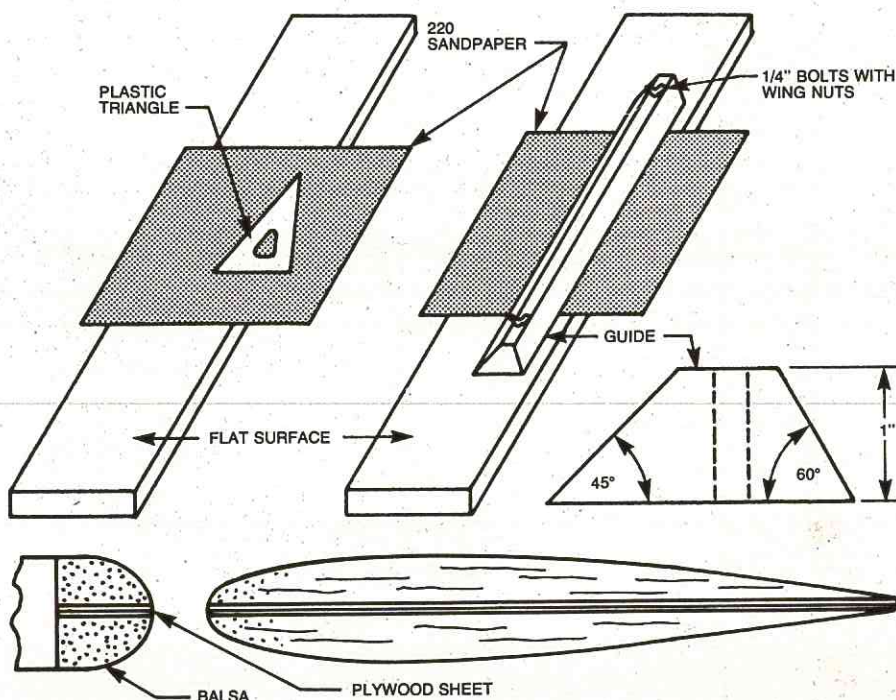
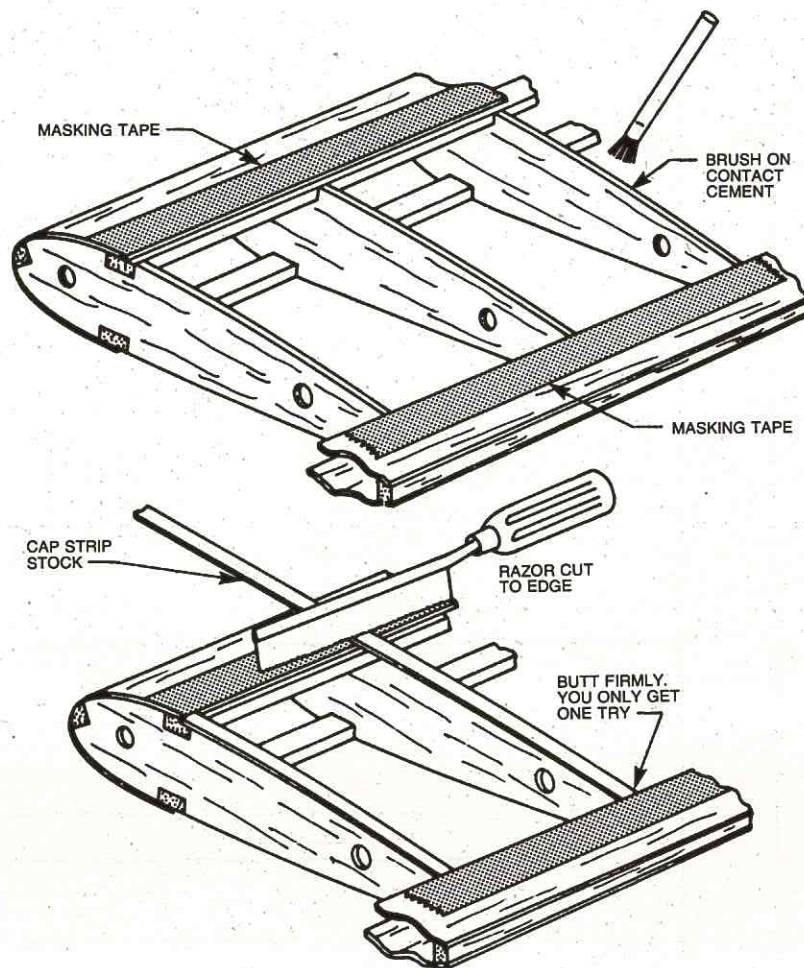
Joe Wallace of Centereach, New York, suggests the following method for speeding up cap-stripping your next wing. First, when ready to apply the capstrips apply masking tape on the leading and trailing edge plane to the edge of the rib. Next, contact cement the rib edges and one side only of the capstrip stock full length, 36" or 48", depending on the length of material you are using. When the contact cement is fully dry, carefully butt the capstrip to the edge on the trailing edge plank and carefully razor saw or cut with a number 11 X-Acto blade to align on the forward plank or sheet. The capstrip should now drop into place and it is completed. Repeat at all other ribs and, when the cap-stripping is completely finished, remove the masking tape and final sand.

The following sketch from George Chabot of Canyon Country, California shows a simple adjustable control horn using a 4/40 x 1 1/2" bolt and standard Du-Bro aileron connector. Try it for a simple and infinitely adjustable control horn.



Here are two guides which are helpful in obtaining an accurate "V" on the hinge side of control surfaces as submitted by Earl J. Haury of Summerfield, Illinois. This first uses a plastic triangle for a sanding guide, the second an easily fabricated jig. Dimensions on the jig are not critical. Earl suggests a 60° bevel for ailerons and elevator and a 45° bevel for the rudder. To use either, scribe a center line on the hinge side of the control surface and, using the guide, sand to the centerline.

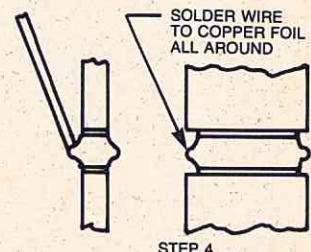
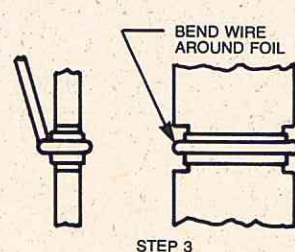
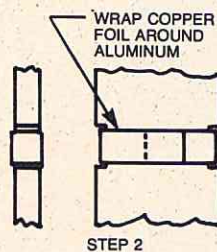
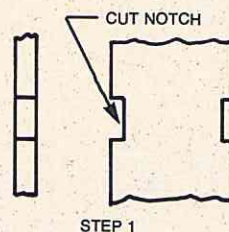
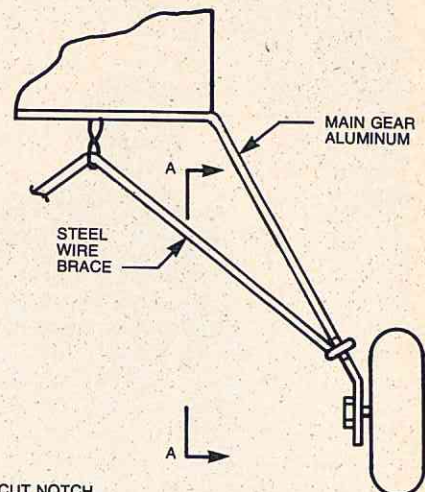
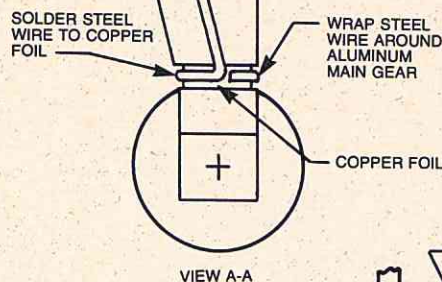
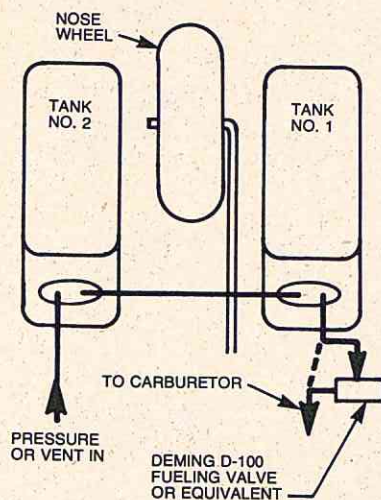
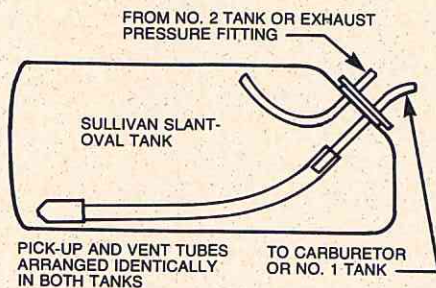
Wing tips are very vulnerable to damage from bumps and smacks during handling and hitting bushes during aborted take-offs and over-shot landings. Balsa wood cannot absorb impact without deforming. John A. Scott of Wilmington, Delaware, builds in impact resistance by inserting a piece of 1/16" or 1/32" plywood as shown in the sketch. The plywood thickness depends on the weight of the aircraft. Up to four pounds use 1/32" thick material while over four pounds use the thicker 1/16" plywood. The ply also serves as a centerline during final



shaping of the tip block and is an excellent guide to maintain symmetry of the wing tips.

When faced with a choice of either running a .60 on an 8 oz. tank or forgetting about retracts, Dallas Hamlin of West

FOR WHAT IT'S WORTH

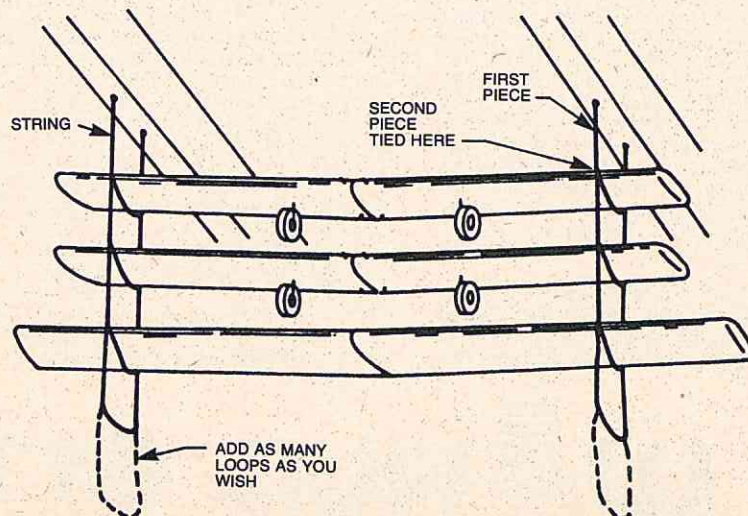


Lawn, Pennsylvania hit upon the idea of using two 6 oz. Pylon Brand slant oval tanks in a saddle-tank arrangement with the nose wheel and strut between the tanks. Dallas has this system installed in a Stafford Week-Ender with Multicon Retracts, and uses exhaust pressure. However, the system will also work without the pressure, providing the engine has good draw characteristics. Basically, tank number 1 as shown in the sketch, is used as a header tank, and is continually re-filled by tank number 2. The system will operate in any flight attitude, including inverted flight, and is completely reliable. It may be fueled through the carburetor line or through a separate fueling valve.

Here is a method for attaching steel music wire to aluminum landing gears or other aluminum structures on our models. Obtain some copper foil tape from your local glass dealer — this material available in 1/4" wide material and is used primarily for making Tiffany type leaded lamp shades. Cut a groove in each side of your landing gear at the location you want to attach the steel wire as shown in the sketch. Take a piece of copper foil and cut it to the same width as the groove and wrap it around the gear, making sure it fits tight in the groove. Overlap the foil about 1/4". Next, bend the wire to fit around the gear over the copper foil. Apply flux and solder all around. The

solder will bond the steel wire to the copper foil, forming a tight band around the gear. The solder, however, will not stick to the aluminum. If you don't need a structural bond, just solder the wire to one side of the copper foil, but you still must apply solder all around the gear to cover all of the copper foil. This idea was submitted by Anthony La Vardel of Belmore, New York.

Here is another way to hang those wings out of the way when in storage. As suggested by Roy Narten, Edmonton, Alberta, Canada. It is simple, inexpensive, and uses a minimum of space. The strings are tied in such a way, as shown in the sketch, that the weight of the wings do not make the knots slide.





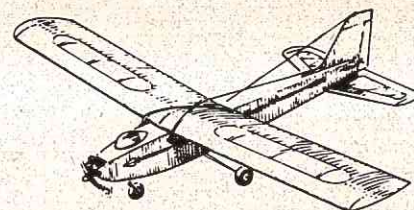
40 size Hawk 460
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Col. John Woods Joins World Engines

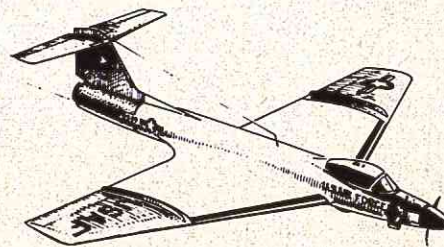
In World Engines advertisements we talk both about our products but also the people who make them. Occasionally, we introduce a new employee. This month it is our pleasure to introduce Col. John Woods recently retired from the United States Air Force. John was Squadron Operations Officer in England and has been stationed in Thailand and countries all over the world. His last assignment was Director of Operations at Wright Field. John has been dropping in to see us at World Engines for the last 12 years and one of his designs, the X 020, is featured in an early issue of the newspaper we published years ago, Model Aircraft World. John has had several designs published in the leading model aircraft magazines in this country. One of John's trademarks in his designs is the profuse use of wood and foam working in conjunction with each other and generally covered with a light fiberglass of the type Sig merchandises. He is currently working on a series of articles telling about his finishing secrets which will appear in the model aviation press.

For some years World Engines has worked in conjunction with the OK Model Company of Japan to bring you Pilot brand almost-ready-to-fly airplanes. This

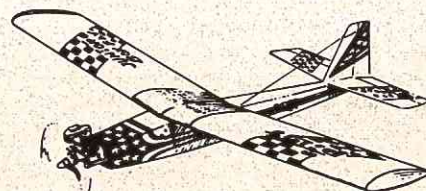
line started out with a fiberglass Robin and Midget Mustang. It has gone on to include almost-ready-to-fly models such as the Olympia, Cavalier, Five Star, Cherokee, Cessna in both large and small configuration, the Gull, Skywagon, Thermal, Stoll, Shell Fly "B", and the Skyknight. In addition to these models employing plastic fuselages, we now have three Box Flies. The large Box Fly is a 40 size model with low wing. The standard Box Fly uses a 25 to 30 engine and has a plywood fuselage. The little Box Fly is similar to the middle size one using a 15 size engine. The Box Fly idea of using a foam wing with a bulkhead keyed to the plywood fuselage side construction is extremely fast, it is strong, it is easy, and it is durable and we hope with John's help that this line can be expanded. Also, with John's influence, we have developed here at World Engines two foam airplanes both of them reinforced with wood. One is a snappy, good flying, 40 size Hawk 460 (pictured above with John) and the other is a quick-to-build 1/2 Diamond. The 1/2 Diamond, like the Box Fly series, is a hand launched airplane. You do not need a large flying field to fly this and this is the reason for its conception. We will be doing more work with this type of product.



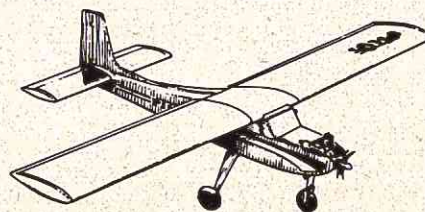
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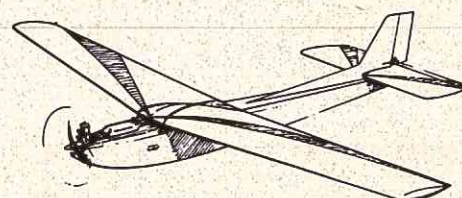
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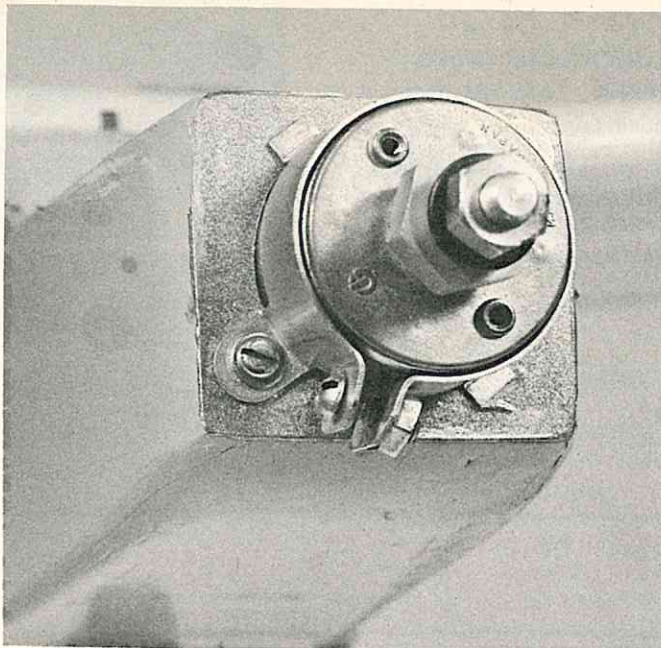
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LEFT: A capacitor clamp is an excellent way to mount an electric motor. ABOVE: New 02 and 05 electrics excellent for small field flying.

QUIET REVOLUTION

from page 53

batteries down after each flight.

A second and more serious drawback to the dump charge is that the battery capacity is reduced at low temperature, increasing the danger of over charge and venting the cell. In developing the Astro Flight power systems I was not satisfied with this approach. I tried many methods before settling on the approach which is now their method (patent applied for). This method has been used successfully for over two years by thousands of modelers. It works as follows: The flight battery is charged from a voltage source which has just a fraction of a volt higher voltage per cell than the battery would reach if fully charged. A current limiting resistor is inserted between the charge source (a lead acid motorcycle battery) and the nickel cadmium pack to be charged. This resistor is chosen to limit the current (30 seconds after initiating) on a fully discharged battery so that about twice the current needed to fully charge the battery in 15 minutes is obtained. The charging voltage is such that this current is nearly zero when the battery is fully charged. The average current is then about 1/2 the initial current and the battery becomes fully charged in 15 minutes. A timer terminates charge at this time so as to

not over charge the cells. If the initial state of charge is not zero then the initial charge rate (current) will be less and no substantial over charge will result. If a mistake is made, and an attempt to recharge a fully charged battery is made, then the initial current will be very low, indicating that the charging process should be stopped. Even if it is allowed to continue, damage is not likely to result because the 15 minute timer will terminate the charge before damaging temperatures are reached. This has been a long explanation of a very simple concept arrived at after over a year of experimentation in electric flight. It has been used by thousands of modelers. Try it I think you'll like it.

QUESTIONS FROM OUR READERS

Since this is my first column the question section will take up the single most frequent question I have been asked when giving club presentations on electric power.

When the topic of electric flight power is mentioned, frequently someone will ask, "What good is it?" "It is heavier and more expensive (in the initial investment) than the glow engines so why should I consider it?"

Aside from the challenge of participating in a new frontier of modeling, the one very practical reason is — NOISE!! Electric propulsion is clean and quiet. It can be enjoyed wearing a business suit during your

lunch hour at the local park. To help you understand the implication of this statement, let me tell you of a recent occurrence. It reaffirmed my conviction that electrics are good for modeling.

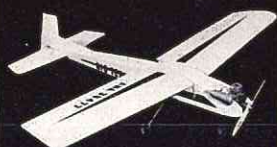
There is a strip of land near our plant adjacent to a new freeway. It is 200' wide by 1000' long and has been bulldozed flat enough to be relatively free of rocks. We have been flying there for 18 months with our electrics, ranging in size from an Astro .020 powered Dick's Dream to an Astro .25 powered Bushmaster. We fly during lunch or on a 10:30 a.m. coffee break two to three times a week. Each session we get two to three flights. Many times when flying, the local police have come by to watch. The only reason they leave their patrol car is to ask how to get involved themselves in R/C flying! There has never been mention about trespassing or of asking us to discontinue the flying in the 18 months.

Now let me relate a different outcome using a glow engine at the same flying sight. Last week we brought a model powered by a .15 glow engine to this field. Two flights were made along with a number of electric flights. All was fine until the following day. After the first flight of the gas plane, an irate member of the Local Home Owners Assoc. showed up. He said he'd heard the plane the previous day and it had taken two days to locate the origin of the noise. The nearest residence is over 1500' from the flying field. He made it clear that if the flying continued, the police would be called. We left without further discussion. No mention of electric flying was made. The next day we drove to the field and saw a police car parked adjacent to it; nevertheless we proceeded to fly an Ace Wizzard powered by an Astro .05. We noticed at the end of our four flights that the police had left without commenting on our activities. We will not fly gas at the site again but hope to use the field for electrics in the coming years without complaints.

to page 72

Bill Warner's 36" span, 4½ oz. Le Petit Brochette.





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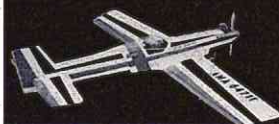
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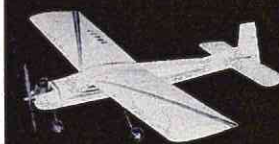
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Now, I don't mean to say the gas motor made an offensive noise, it didn't! The adjacent freeway isn't exactly quiet! The point is there are many people in the world who **hate** the sound of a model **engine**. The electric motor lets you enjoy your hobby within earshot of these people. I have been flying models for over 30 years and have been chased off more beautiful flying sites than I care to remember. Perhaps the people

offended really hate the thought of a grown man enjoying his hobby. The noise complaint is a legal means to stop him. If you find yourself in this situation, try an electric. You can be seen but not heard.

The curious will wonder why a lone man is standing in mid field, holding a strange box and looking at the sky. Others will see the plane and wonder how its being piloted!

from page 64/54

powered Astro Flite RF4 Fournier provided a sharp contrast in quietness. The entire Sport Scale event was a tremendous turn-on for contestants and spectators alike.

Go fast and turn left! That's racing and the Quarter Midgets are doing it. There is one thing for sure, you don't know the winner until the race is over. Tom Prescott to page 74



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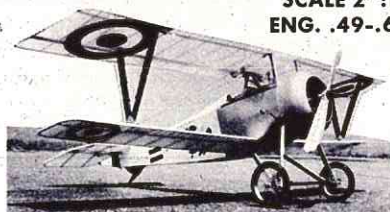


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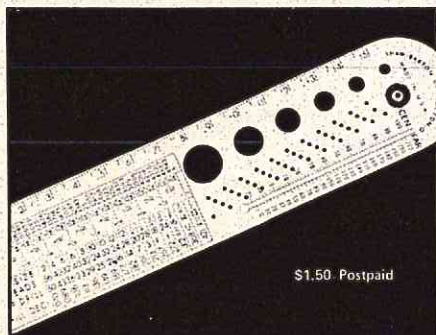
from page 72/54

won the tie breaking fly-off with Jack Stafford for 1st in QM. The last heat was an example of how it can go. If Tom Prescott were to win that heat, he would beat Stafford's score and take 1st place by 1/2 point. Prescott won the heat but his engine quit before landing and the 1/2 point penalty resulted in a tie. On take-off of the fly-off, Stafford's Mustang was diverted by a wheel bumping an expansion joint in the concrete

and Prescott had a whole lap on Jack before he was airborne. Those unpredictable incidences seem to be a leveling factor that enhance everyone's opportunity to win.

There were 69 entries in QM and most of the contestants had back-up racers. That made a whole lot of pretty airplanes waiting to fly and fly they did! Matching frequencies for heats and the fueling processing were handled efficiently. There were always 3 or 4 back-up heats on the ready line. Recognition must be given to the large numbers of Tucson RCC members who did a tremendous job in manning three full afternoons of QM racing.

Most available QM kits were evident in sizable numbers but there were also



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numerous original designs. Attention to details contributed tremendously to their competitiveness regardless of design. Comments on hot engines. for instance, could be traced in many cases to the propellers. When we observed stock propellers being selected with a Prather prop pitch gauge we noted props out of the box having a pitch difference between blades of up to 1 1/2". The selected props with matching pitch were then checked for balance. Rules state that only one blade may be reworked for balance. This kind of concern is strictly within the rules and a propeller that is both static and dynamically balanced can easily net an additional 1000 to 1500 rpm from the same .15 engine with an unbalanced prop.

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The QM pilots seemed to have come from everywhere. It would take too much space to try to identify them and where they are from but you can bet on one thing, they were competitive and close races were almost routine. Our congratulations to the entire QM racing group for a good show.

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to page 78

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WINTER NATIONALS

from page 74/54

for a large model meet. Acres of concrete ramp space can handle any contest. Long runways stretch out for those airplane drivers that want to fly in their own big birds. On the ramp is a snack bar and clean rest rooms. Close by are housing facilities offering both motel and barrack accommodations. A bar and restaurant with banquet facilities are located in the center of the living quarters.

And speaking of banquets, there was one on Saturday evening following a relaxing "happy hour." President Bill Pernet must have attended a lot of banquets because he handled the festivities beautifully, after a delicious meal, he kept it short and to the point. A special Sportsmanship Award was presented to Mark Radcliff from World Engines. Mark had advised the CD of an error of 150 points in his favor in the score. Correction of the error dropped Mark from 2nd to 7th place. Nancy Hempel was

presented a gift for her dedicated effort in tabulating score throughout the meet. Hmm — I never got an award for scoring!

Helen Taylor received a plaque as Woman of the Year for the tremendous job of handling the correspondence related to the meet — entries, reservations, prize donors and all that other routine but necessary stuff. Joe Bridi accepted a plaque of appreciation on behalf of Radio Control Modeler Magazine. Our thanks to the Tucson RCC for the nice gesture.

Trophy presentations were made to the Sport Scale winners with appropriate remarks reflecting their individual flights and another banquet came to a happy end.

And so, that was the 1974 Winter Nationals and it was a great one. □

QUARTER MIDGET

from page 52/50

Hydros and held two world records and was the first person to break 30 mph with a model boat. Dan began flying at age 17 and

started racing Quarter Midgets in 1972. Dan and his wife Mary have two children and are expecting their third in a few months. He is the owner of DK Hydraulics in Chicago where Mary also works part time.

Dan also flies Formula I and has flown QM races using all of the different scoring systems and course layouts. He prefers the shorter 400' course to the AMA official course. He also likes the point system using a one point maximum score for one pylon cut. Dan prefers to fly with flagmen but feels it is too difficult for smaller clubs to get the manpower necessary and does not like the hasseling and lost time resulting from make-up laps using the Formula I scoring, stating "It puts too heavy a burden on the CD and workers."

He feels that clubs should vary their procedures to try what other groups are trying. Dan feels that the current AMA rules are workable but that there are too many loopholes, especially on the scale aspect. Dan would like to be able to modify props as he says it is too expensive to have to buy large numbers of props to get a few good ones. Dan also feels that the idle rule on

to page 80

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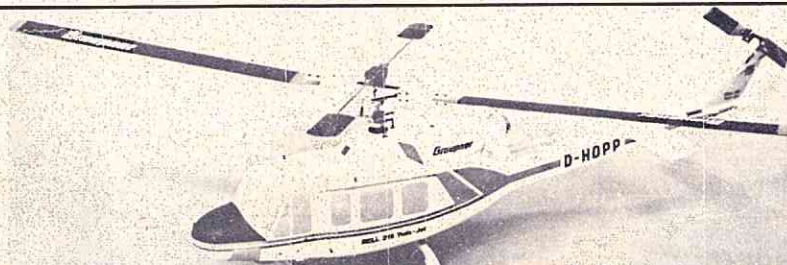


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QUARTER MIDGET

from page 78/50

asphalt fields should be for ten seconds with the airplane not rolling more than the length of the aircraft. On grass fields he would like to use a one point maximum for a dead stick landing (automatic 4th place) and not use an idle before take-off.

There will be a one day race in Chula Vista, California on Sunday, March 2 starting at 9 AM. Contact Ramzi Thomas, 360 Bay Blvd., Chula Vista, California 92010, (714) 427-0354. Fuel supplied will be KB 500 donated by K & B Manufacturing Co. □

SUNDAY FLIER

from page 48

Bob, we don't really disagree too much. The only event in FAI that I took really violent exception to was the speed event. And then, my objection wasn't so much to the concept of the event as it was, and is, but to the short course over which it is run. Two lengths (downwind and back to the starting line) of a short course doesn't, in my opinion, prove anything except that you've got a strong wing. Four lengths, on the other hand, will normally require at least some demonstration of an efficient L/D performance.

What with conditions being different throughout the world, it is highly unlikely that we will ever see full agreement on a three task contest. It doesn't really matter too much, though. Each geographical area lends itself to certain types of flying, and that's what is likely to emerge as the flyers in those areas try various events and finally settle on the ones they like. I can remember when we tried an event called "Emergency!" You go up on the tow, knowing that an emergency might be called shortly after release, or it might not, in which case you were to go after a five minute flight. Now, since you didn't know, until the "referee" yelled, then you'd better get as high as possible so you could make the five minutes. So you got as high as possible, and a couple of seconds later, you heard the cry "Emergency!" And when you heard that, the objective was to return to the ground in the shortest possible time — and without shedding parts either on the way down or when you hit the ground! And the guy who did it in the shortest time won! Well, it was a pretty sporty course, but it didn't prove anything about your plane's performance, so we gave it up.

So the idea is to have a contest which gives the most fun to the most fliers, but still proves some performance capability of the planes involved. And when there's a big

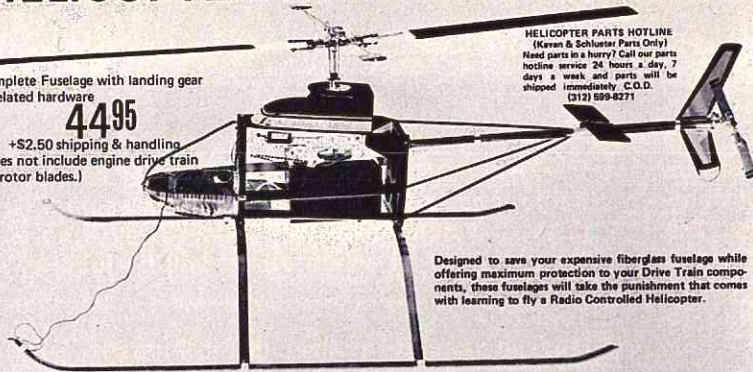
to page 84

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SUNDAY FLIER

from page 80/48

intersectional, national, or international contest, then take a look at the events, and decide for yourself whether it looks like fun. And if it ain't fun, don't do it!

Speaking of geographical areas and

flying in them, I received this letter from Andrew Macdonald, Box 26, Carcross, Yukon:

Dear Mr. Willard,

I have just recently moved from Ontario to the Yukon Territory where I am living and attending school. Being an avid R/C enthusiast back home it is only natural that my interests follow me here to the Yukon. I

have a five channel Heathkit outfit still at home which I am considering having sent up. The community I'm living in is situated in a valley surrounded by many lakes and towered over by many mountains. Quite a few of these mountains host sides the heights of which are easily accessible on foot. What you have then is a glider enthusiasts dream. These sides then lend themselves to the

to page 86

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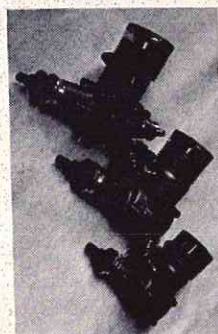
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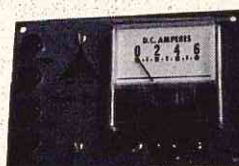
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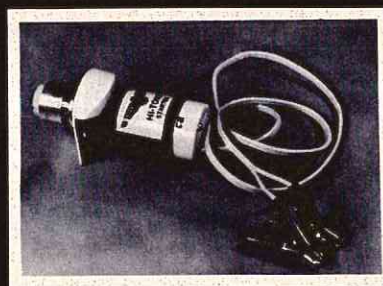
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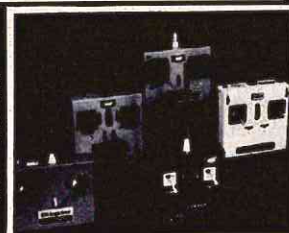


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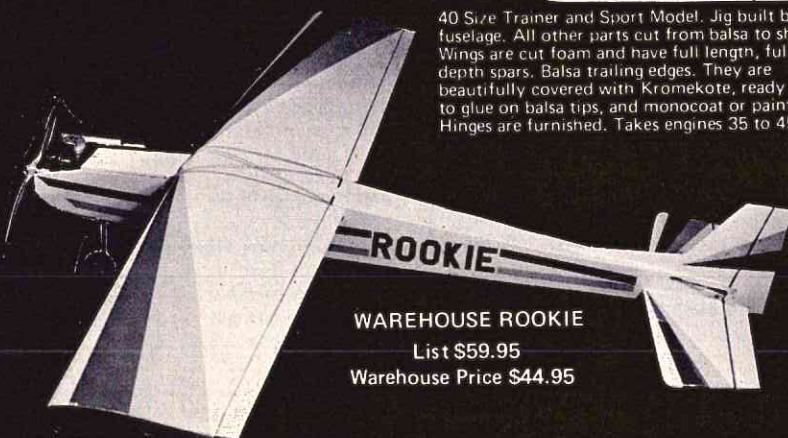
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SUNDAY FLIER

from page 84/48

interests of both slope soaring and thermal enthusiasts. The winters here in the Yukon however are long and cold. I've already figured out one main advantage though that the cold brings and that is that the lakes around which the mountains here are situated freeze, offering the largest, smoothest, and most accessible landing area imaginable.

I've been into R/C now for almost three years and my interest has centered mainly around powered flight. I do have a few hours in the air on a sailplane but I still consider myself a novice in the art of silent flight. Since the geography of the land here seems so much more suited to soaring than it does to powered flight it just seems the natural course upon which to follow-up my R/C interests.

Any advice you can give to me on soaring in extreme winter conditions, the risks etc., on plane and radio, the most suitable designs for these conditions, battery care in cold temperatures, as well as anything you might have to say about shipping one's R/C gear would be greatly appreciated.

Yours sincerely,
Andrew Macdonald
Carcross, Yukon

About all I can say, Andy, is that as far as the plane designs are concerned, there's no difference in winter or summer. I've made as many one hour thermal flights in January as I have in July — but it's a helluva lot harder on the pilot!

I'm not too sure about the radio bit, but from what I read in the brochures, present day equipment will work at temperatures well below zero. And I'm told the best way to preserve batteries is to keep them in the refrigerator, but up there, maybe it's more like keeping them in the freezer, and I don't know the answer to that. Maybe some battery expert will read this and let us know. And as far as I know, normal shipping and wrapping should be okay.

Now I am compelled to express an opinion which probably will get me some nasty letters (at least one, anyway) but I feel a responsibility to Sunday Fliers, and when I think they are being bamboozled, I've gotta' say so.

I have two books before me. Both were written by a Harold Cunningham (no relation to Chuck!) somewhere in a town called Bowie, Texas.

The first book is titled *Everything You Should Know About Radio Control Flying*. It is a good book. Maybe a little grandiose in the title, but it has some good information in it, and is a useful text for the beginner in R/C.

The second book is entitled *The Crashless Way to Advanced Radio Control*
to page 88

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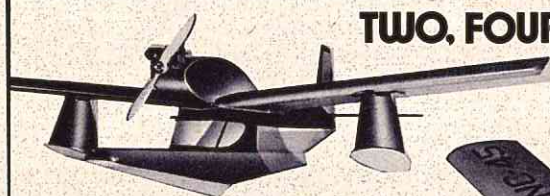
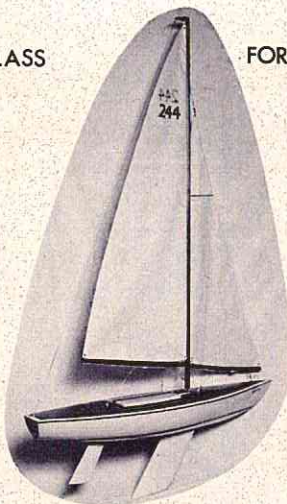
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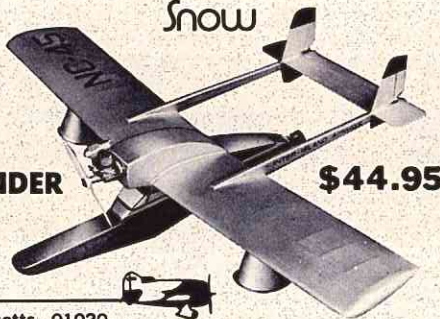
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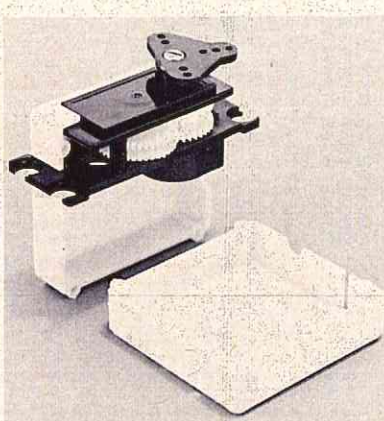
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SUNDAY FLIER

from page 86/48

Flying. It is further identified as the "The Sunday Flyer's Flight Manual."

Seldom have I seen so much bullbleep concentrated in one binding. The sad part of it is that, interspersed with the crap, there is some good stuff — but you better be a pretty smart sparrow to pick out the oats in this pile!

Example (paraphrased). *You're better off flying with a single stick transmitter.* Baloney! You're better off flying with the system that is most natural to you. I personally happen to prefer single stick, but it is only a personal preference. I don't know what the manufacturer's records show, but my guess is that there are more two sticks sold than single sticks. And, for fun flying you use the one you feel the most comfortable with.

One more. *A rudder is less effective with a swept back wing.* Now that is dead wrong! Sweepback increases the effectivity of the rudder! Look; roughly five degrees of sweepback gives the same effect as one degree of dihedral, and if your airplane doesn't have ailerons, then the way to make good turns with the rudder is to have some dihedral in the wing. A number of years ago I designed a swept wing pusher for rudder only flying. It had no dihedral, but the turns were smooth and well banked just as though it had ailerons. Why? Simple. All a rudder can do is induce a skid. So when the airplane starts to skid, two things happen with a swept back wing. The spanwise flow on the inside wing is increased, which decreases the lift. The spanwise flow is decreased on the outside wing, plus the fact that the outside wing is now presenting a longer leading edge to the wind vector. The resulting increase in lift induces a bank in the direction commanded by the rudder, giving the effect of coordinated aileron and rudder turn.

Oh, there are a lot of other pontificating on the obvious statements — like *if you are distracted* (for one reason or another) *you probably will crash.* Hell, you don't need to pay five bucks to find that out. I was flying down at Sunset Beach one day and a well stacked female worshipper of the sun stopped alongside in her bikini and asked how I controlled my sailplane. I turned, took a good look, enjoyed it, and then looked back at my plane just in time to see it hit the hill.

"Very badly," I replied. Sure, I was distracted — but as I said, I enjoyed it, and the repairs weren't all that bad.

As far as I am concerned for you Sunday Fliers, the best thing that could be done with this book would be to collect all copies, put them through a shredder, and spread the bits over that rich Texas soil.

No matter what you planted, it would grow twice as fast with this fertilizer.

Save your money. □



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ALUMINUM SKIIS

from page 47

must be made next. This piece is probably the most difficult to make if you do not have a drill press, however, it seems that nowadays most people either have a drill

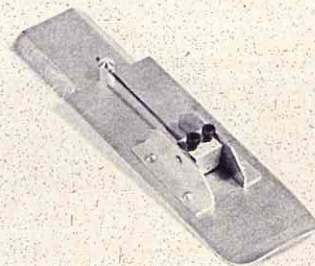
press or know someone who does. Follow the plans for the location and size of each hole but, again, remember that the axle hole must agree with the diameter of your axles. The 1/16" diameter hole in this block must be a press fit for the 1/16" diameter spring wire. In the event that this hole comes out a little too large, you can prick punch the

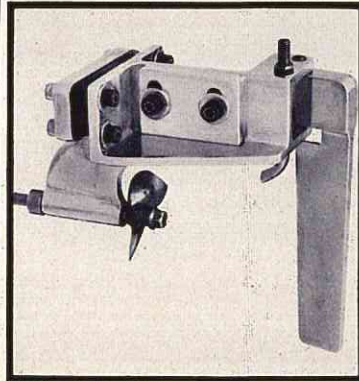
outside of the block, thereby pushing the metal into the 1/16" hole, making it a little tighter, or the 1/16" diameter wire can be bent slightly. However, the former method is recommended.

Assemble the spring wire to the block at this time. I did it by placing this wire in a vise and hammering the block down onto it with a plastic hammer. Remove the brackets from the skiis and countersink the bottoms of the holes so that, when assembled, the rivets or screw heads, are perfectly flush with the bottom surface of the skiis. Deburr all parts and rub with steel wool or very fine emery cloth. The entire skiis can now be assembled. Use two 6-32 Allen cap screws for each block so that they can be well tightened on to the axles. The skiis can now be painted, or MonoKoted, or just left plain.

To mount the skiis on your ship use wheel collets.

These skiis were used on my "G-Ray" with total success. The plane handled exactly the same as with wheels. If anyone makes and uses a pair of these skiis, I'm sure they will be very pleased. Incidentally, my "G-Ray" will turn on the snow and make a full 180° turn within the average width of a road where I fly. □





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FLIGHT TRAINING SEMINAR

from page 42/39

members of the Champaign County Radio Control Club. This unit will also enable you to see just what "torque" reaction is on a helicopter. It will also give you a chance to learn the correction factors necessary to combat the torque while applying power to lift-off. This, as with the training pole, can all be accomplished while your chopper is safely tied to the training wheel. Unlike the pole, however, the unit is portable and can be transported to any place where you desire to run your helicopter. It will not provide the tilt on the cyclic controls, as with the pole, but will allow you to trim your helicopter for torque reaction. As with the training pole, this training wheel can also be a valuable aid to the veteran pilot for checking out trim conditions and sensitivity of tail rotor controls on a new helicopter by having everything set for near neutral position on the transmitter before that first lift-off. You can really appreciate the trainer if you have ever set you tail rotor blades in too flat or too high a pitch and tried to lift-off only to have

to page 92

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Now available from RCM Products is the finest quality Nichrome wire for foam wing cutters. Available in packaged 5 foot lengths for \$2.00, this is the finest material of its kind available. It is designed for extremely precise and smooth cutting of foam wing cores, and can be used with any commercial or home-built foam wing cutter.

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FLIGHT TRAINING SEMINAR

from page 90/39

the bird start spinning around like a top, right when you are not prepared for it!

The necessary materials to make the training wheel are readily available to anyone. They consist of two 2" x 4" x 36" pieces of white pine; one 1" x 10" x 36" length of white pine; a used 24" or 26" front bicycle wheel; and two 12" elastic carrier straps from a bike shop. To assemble the training wheel, nail the 1" x 10" x 36" center board to the two 2" x 4" x 36" strips

as shown in the sketch. Drill a hole in the center of the 1" x 10" x 36" (3/8" diameter) and start assembly by inserting one end of the wheel spindle, or bolt, through a large flat washer, then through the 1" x 10" x 36" board, followed on the bottom of the board with another flat washer then the nut. Tighten this nut very firmly so the wheel cannot work loose during use. A 26" front bike wheel will generally accept most chopper skids. **Visually center the main rotor shaft directly over the center of the bike wheel**, strap the skids to the wheel with the two elastic straps, check everything for balance and you are ready to go.

The same mounting procedure holds true for using the helicopter training pole. Whether you use the pole or the wheel, the Center of Gravity of the helicopter should be located as close as possible to the center mounting hole on either the training pole or training wheel. If this is not done, the helicopter will be off center and will have a tendency to lean in one direction or the other from its own weight. Be sure to tighten the wing bolts down tightly on the training pole so that your helicopter will have no tendency to come loose when full throttle is applied.

While you are building the helicopter
to page 94



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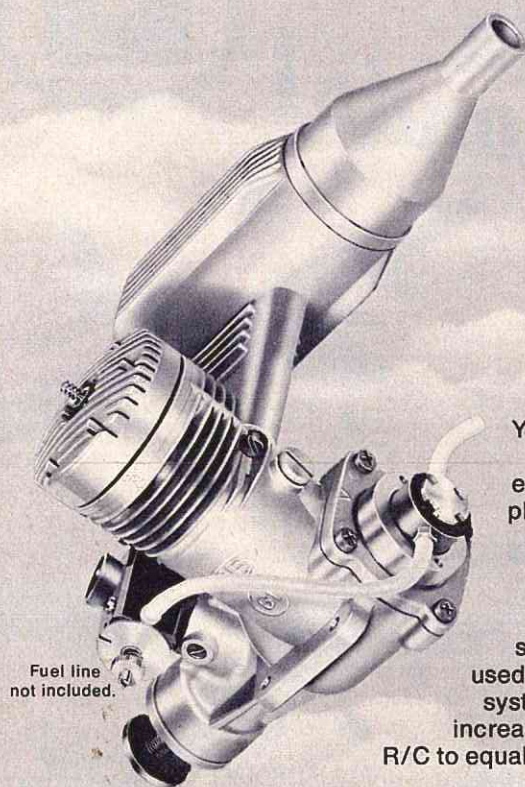
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Special Edition Plans

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FLIGHT TRAINING SEMINAR

from page 92/39

training pole and wheel, start construction of the RCM helicopter training table presented in RCM a few months ago. Next month we will show you how to set up a daily program of using your training pole, or wheel, for a few minutes each day to learn the torque reaction of your machine and to get it properly trimmed out, combined with a 1/2 hour indoor session of training your reflexes on the helicopter table with regards to the cyclic controls. This will be followed in a future article by helping you through your first free flights using your training fuselage or, in the case of the Du-Bro Shark, the training platform and outriggers. All of this may sound like a great deal of unnecessary work, but we assure you it isn't. It has proven quite successful and the minimum amount of time and money involved in constructing the various items will more than pay for themselves by reducing repair time and replacement parts cost, not to mention the rapid increase in proficiency you will develop as compared to simply taking your machine out, lifting-off, and seeing what happens.

Stick with us and you will be surprised at the results. □

SUN RAY

from page 31/25

help bend it around. Pin and glue into place. Repeat for the other side. Let dry. Trim off excess sheet flush at bulkhead #3A and Former F4.

Cut out the tail surfaces — vertical fin and rudder from 1/4" balsa, and stab and elevators from 3/8". Sand the leading and trailing edges to contour.

Epoxy the four hardwood wing blocks into place; exact position is not critical. Drill two 1/4" holes in the 1/4" plywood plate to accept the upper wing dowels. Pin foam tape in the saddle and fit the upper wing to the saddle and the dowel plate. Epoxy the dowel plate into fuselage. Fit the lower wing to the saddle (with tape in). Mark and drill bulkhead #2 for the lower wing dowels, checking that the lower wing outer panels are parallel with the upper wing.

With both wings in place and aligned, drill and tap the hardwood wing blocks for 1/4" — 20 nylon bolts. Glue the stab on with the wings in place and align with the upper wing. Let the glue dry. Then glue the vertical fin. Let dry. Add the fairings behind the turtle deck, glued to the fin. Notch the fuselage for the plywood tail wheel support and glue into place.

Cut out the fuselage at the engine compartment to fit your engine. After completing all cut-outs, give the engine and

to page 96

first ED ELLIS then JOHN ROTH won NATS RC scale with COVERITE



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The Integra is a unique airplane in many respects. It was designed specifically for retractable gear (fixed gear is supplied with kit); total accessibility to equipment (including fuel tank) from inside fuselage; exceptional slow flight characteristics due to the hybrid wing design; quick construction techniques for fast building; extensive instruction manual to cover all aspects of building and finishing. Doubly important, it combines contest proven performance together with docile handling characteristics which make it ideal for the average Sunday flier. To sum it up, a completely engineered airplane.



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Weight: 7-1/4 lbs.
(with retracts)

Price \$67.50

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SUN RAY

from page 94/25

tank compartment a liberal coating of slow drying epoxy. Bolt in the engine mount and the engine. I used a Kraft glass filled nylon engine mount. Glue the 1/16" plywood nose ring to fit the 2 3/4" spinner, and final sand the fuselage contours to match.

With the upper wing in place, make the upper wing canopy platform from 1/4" balsa and fit into place. Drill two holes through it into the wing top sheeting. Line up the blind nuts in the small 3/16" x 3/8" balsa cross block shown on the plan and glue this to the wing. Make the enclosure from a solid balsa block, or if clear plastic, cut out the rear portion of a Sig WW II #11 or #13 canopy. Fit and glue the enclosure to the platform, sanding all parts to match the fuselage front and turtle deck. Mark and glue in the rear canopy 1/4" locating dowel to fit a matching hole in bulkhead #3A. The remaining things need to be scheduled with your finish method. Install the tail wheel assembly. Cap the rudder bottom with the plywood plate and plastic tubing for the tail wheel wire. Sand the entire airplane and hinge all surfaces.

Finish

A beautiful, reasonably fast and lightweight finish used on the Sun Ray was to MonoKote the wings, then spray paint the fuselage and tail surfaces with K & B Superpoxy of matching color. The fuselage was prepared by smoothing out most nicks and hollows with Hobbypoxy "Stuff" and block sanding, then covering the whole thing with silkspan and one coat of Aerogloss dope. Wait 48 hours, sand lightly and apply about 8 coats of Superpoxy Primer, block sanding and filling (if necessary) after 3 coats and the last coat. Finally, spray with K & B Superpoxy.

Flight Characteristics

See that the plane balances as shown on the plan. This is important since balance is rather critical for outside maneuvers. Start the take-off run full throttle with up elevator to keep the tail wheel on the ground. After gaining a little speed, immediately go to neutral elevator, to let the tail come up and level the airplane. Allow plenty of time to gain flying speed, then ease her off with slight up elevator.

You'll find the Sun Ray an exceptionally easy airplane to fly, very steady and stable, but with plenty of control effectiveness for any maneuver in the book, and "then some."

If the plane is rolled to the right and a little left rudder is given, easy knife edge flight is obtained. A little more rudder will cause the airplane to climb out in a knife edge position. Keep feeding rudder, and she will complete the 270° knife edge loop.

You'll be pleasantly surprised at the relatively high flying speed for a biplane.

to page 98

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CENTURION II

Span 100 inches
Area 618 sq. inches
Flight Weight .. 28 ounces
Airfoil Undercambered

\$49.50

Calif.
Res. add
6% tax

Don Dewey's forecast that the Centurion II may be the ultimate in 100" sailplanes is certainly becoming true. Due to its ease of construction, rugged design and forgiving flight characteristics, this plane has accomplished something more important than winning many local and national competition trophies. It has interested new modelers in R/C soaring. Welcome and good flying from Soarcraft.

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Span 119 inches
Area 842 Sq. inches
Flight Weight .. 52 ounces
Airfoil Flat Bottom

LIBELLE \$69.95

SKYLIFT SUPER DUTY CHUTE \$9.95 STD. DUTY CHUTE \$6.95

SUN RAY

from page 96/25

Axial rolls are true, with only a little elevator trim required, and can be made at a very high rate if desired.

Try a long slow roll to run the length of the field. She will track beautifully, and easily maintain altitude with just a small amount of rudder and elevator trim applied successively as she rolls.

Now cothing in to land, chop the throttle, approach and she will slow down nicely. Set

her down on two wheels with the tail still just off the ground, which seems to be the most satisfactory. Taxi her in, and you'll realize what a really great flight you've just had.

BF-109E

from page 23/19

With the wing at this stage, let's go back to the fuselage and add the wing fillets. Take two pieces of Saran Wrap, 3" wide, and tape them across the wing chord so that,

when the wing is installed in the saddle, there is about 2" sticking out each side of the fuselage. Screw the wing in place. Using masking tape, outline the edge of the fillet that will fall on the wing. Make the triangular pieces that go behind the wing per plans, and epoxy them in place. Mix up a putty of polyester resin and "micro balloons." Apply to the fuselage and wing until you get the desired shape. When the putty gets to a jelly state, peel off the masking tape, leaving the fillet outline. When completely set, remove the wing and finish sand the fillets. Re-prime and wet sand this area.

to page 100

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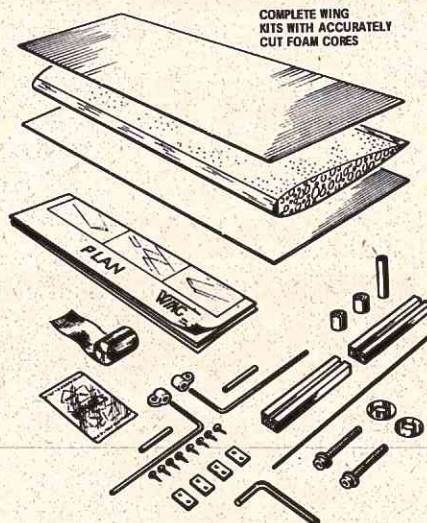
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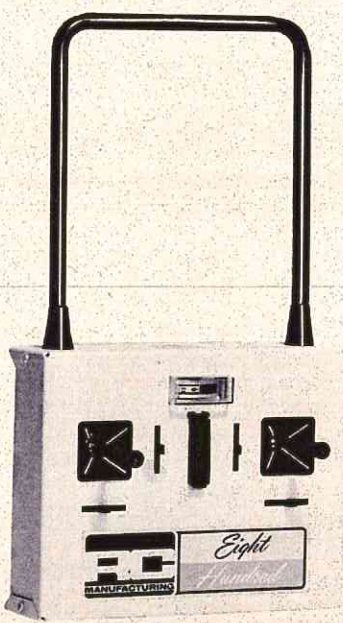
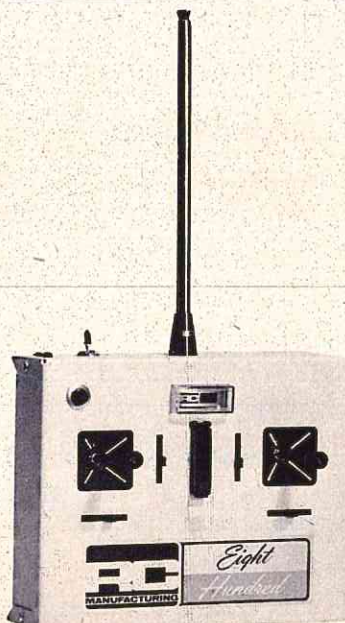
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BF-109E

from page 98/19

BF-109E

Designed By: Carl Longfellow

TYPE AIRCRAFT

Sport or Stand-Off Scale

WINGSPAN

54 Inches

WING CHORD

11 5/8" Center - 6" At Tip

TOTAL WING AREA

482 Square Inches

WING LOCATION

Low Wing

AIRFOIL

NACA 2415

WING PLANFORM

Double Taper

DIHEDRAL, EACH TIP

3 Degrees

O.A. FUSELAGE LENGTH

43 Inches

RADIO COMPARTMENT AREA

(L) 11 1/2" X (W) 3 1/2" X (H) 3"

STABILIZER SPAN

19 3/4 Inches

STABILIZER CHORD (incl. elev.)

4 3/4 Inches (Average)

STABILIZER AREA

93 3/4 Square Inches

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Lower Portion Of Vertical Fin

VERTICAL FIN HEIGHT

5 Inches

VERTICAL FIN WIDTH (incl. rudder)

6 Inches (Average)

REC. ENGINE SIZE

.40-.50 Cubic Inch

FUEL TANK SIZE

6-8 Ounces

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rudder, Elevator, Ailerons, Throttle

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa and Ply

Wing Foam Core, hardwood spar,
& cardboard sheeting

Empennage Balsa

Weight Ready-To-Fly 80 Ounces

Wing Loading 24 Oz./Sq. Ft.

Now for the spinner. I used a standard 2 3/4" "Tatone" one with those "unsightly screws." Mount the spinner on a piece of 1/4" diameter threaded rod about 3" long. Chuck the whole assembly in a drill press or a securely anchored hand drill. With the assembly turning, use a razor saw to cut off the front part to about a 1 3/4" diameter. Cut a disc of this diameter from some scrap ABS plastic and bond it to the front end of the spinner with 5 minute epoxy. (Roughen up both the spinner and the ABS to assure a good bond.) After the epoxy sets well, spin the assembly again and, using a small file, to page 102

DAMN CHEAP NOSEGEAR!

I should've bought...

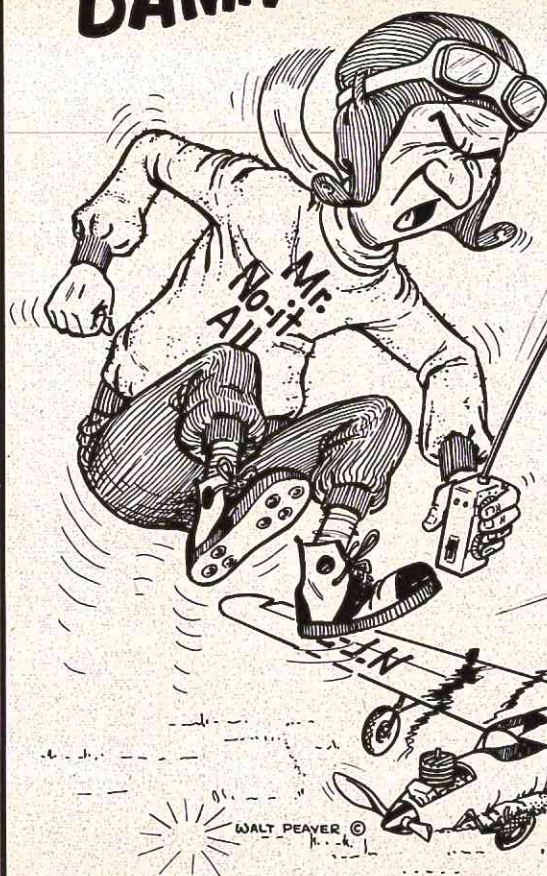
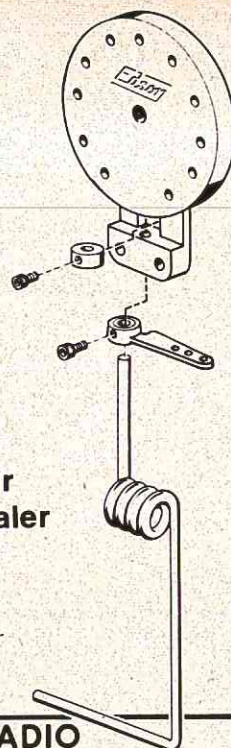
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BF-109E

from page 100/19

or sandpaper, shape the newly bonded disc to the contour of the spinner. Finish sand the whole thing, and paint it with dope. This seems to hold up very well, even to the abuse of a starter.

Now I believe we're down to the final finish. I mixed 50% acrylic lacquer (color) and 50% clear butyrate dope. This method gives an unlimited number of colors to choose from. Thin for spraying with butyrate thinner, and have at it. After the colors are down and dry, shoot the whole bird with two coats of clear dope, and that's

it. If you desire a "flat" finish, do not apply the two coats of clear dope. Instead, spray with one coat of "Flecto-varathane" liquid plastic, #91 satin finish.

FLYING

Flying this bird is very easy. While taxiing, hold a little up elevator. For take-off, hold a light pressure on right rudder, and advance the throttle slowly. Don't slam it forward. In about 20 feet her tail will come off, and if she veers a little to the right, don't jerk left, but just release the right rudder pressure. Work the rudder and throttle gently, and this "tail dragger" will handle very nicely. Add a little up elevator, and you're airborne. From this point on, I'm sure almost everybody out there in R/C land

flies as good or better than I can, so have at it. Assuming you have balanced the plane per the plans, you will find it has a very shallow glide angle. You might find yourself wishing you had an extra channel to deploy an anchor!

Good luck and lots of good flying. □

CUNNINGHAM ON RC

from page 16

work surface, I installed two more shelves about 8" apart, running the full length of the work surface. This gives you a really good building area for almost all normal size aircraft, and plenty of storage space for all of the small tools that you will need. It all fits into a space 2½ feet wide by 6 feet 8 inches long by less than 4 feet high. If you like to sit down while you work, purchase an unfinished bar type stool — it works well and can be stored under the table. This entire work area can be built for less than ten bucks, and about two hours work.

Now, for the real kicker. Suppose that you have the space in your bedroom, or den, and just suppose that your wife has given you the go ahead to occupy this space. So, what can you do to keep her happy with the looks of your work area while you are at work, or when she has the girls in for bridge? Well, make another trip to the

to page 104

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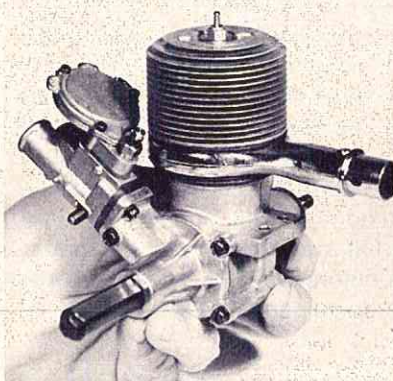
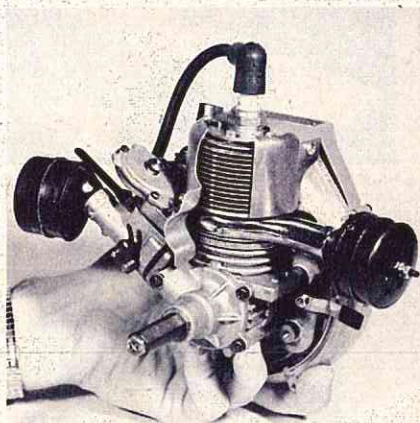
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CUNNINGHAM ON RC

from page 102/16

lumber yard or building materials store, and pick up some solid shutters, about five or six feet high. Again, see if you can find some defective ones — they're a lot cheaper. Get several sets of shutter hinges, then build yourself a screen, much like the old time screens that the saloon ladies dressed behind in the old western movies. You can decorate the screen, or stain it, or better yet, let your wife decorate it. Now, when you want to hide your workshop, simply place the screen around it, and no one will know that you have the usual model builders mess behind it. Probably for a total outlay of twenty five bucks, or less, you will have a super bedroom work shop, and a happy wife — a tough combination to beat! You might even decorate the outside of the screen with pictures of your kids, or your wife's art work. An easy way to put a finish on the screen is to use contact paper from the hardware store.

★ ★

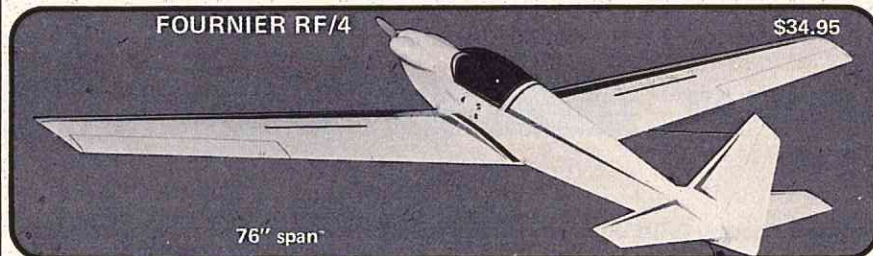
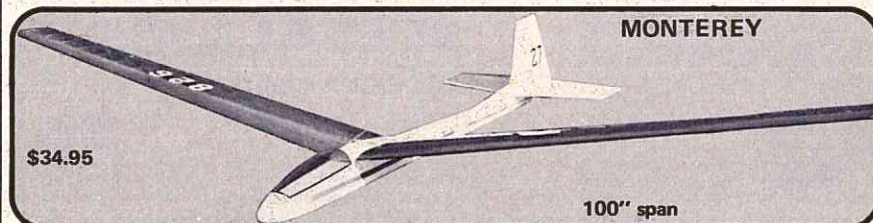
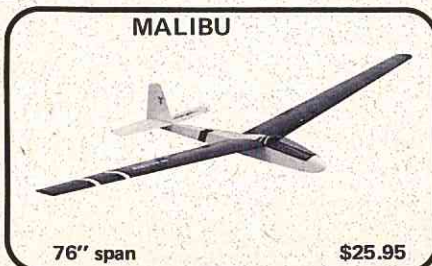
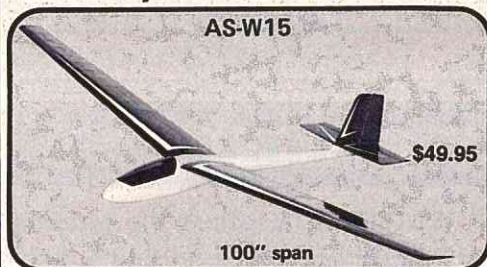
This Winter, like every other one, has been a good time to get your building projects completed, or to start on the new project that will get completed only when the weather is again asking you to come outside and play. Here, then, are a couple of building tips passed along by friends. First, if you have ever suffered through the agony of split balsa parts due to forcing a pin into hardwood, try another method. Bill Slater advises that you get several old used files from a surplus store and use these heavy files to hold the balsa parts in place while the glue is drying. If you can't locate any old heavy files, then try some pieces of scrap steel or, if that fails, try a brick or a concrete block — or lean on it for a while. But, Bill likes the files — try it.

Another thought from the fertile (?) mind (?) of old Gate Mouth, Helmer Johnson, is to pre-bend cap strips that you are gluing to the top surface of ribs on a wing. You can pre-bend the cap strips by pulling them over the edge of your building table, rolling them with a rolling pin or, sometimes, simply by flexing them. In any case, if you pre-bend them you will find that they go on the ribs much easier, and will stay in place without excessive pinning, or mashing them in place with Bill's files.

How about hinges? These worry me a lot, and the main worry that I have is that your hinges may not be as safe as you think that they are, and just might let go at just the wrong time. Always be sure, when installing hinges, that they are really installed well. The 'hidden hinge' method of punching holes into the hinges, squirting epoxy or silicone rubber into the hinge slot, and then cramming the hinge into the slot is a beautiful method of installing the hinge, but are you sure that you really have the hinges installed so that the adhesive will

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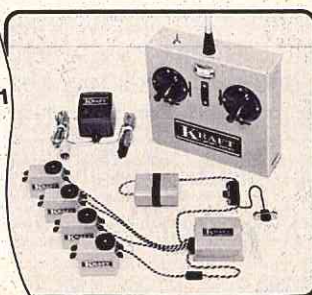
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CUNNINGHAM ON RC

from page 104/16

keep them from pulling out? I have lost two airplanes over the years due to elevator hinges parting company from the surface, and this is a pretty stupid way to lose an aircraft. One was due to using silicone rubber to hold the hinges in place in a foam stabilizer, and the other was using hot melt glue to hold the hinges in place in a wood stab. After a year of sitting on the shelf, the first flight showed me the error of my ways. Ever since I have been in the habit of pinning hinges with either straight pins or pieces of round toothpicks. It may not look quite as lovely as the hidden jobs, but to this ham handed builder, it is a little bit safer.

☆ ☆

This next item is not a building tip, but rather a warning to all of you who are getting into R/C flying for the first time this year. The warning just may be of value to some of you 'older beginners' too. This warning is about propellers. The most dangerous piece of your aircraft, both to you and to nearby spectators are the whirling blades of the prop. Even at idle speeds of two to three thousand rpm they can be very dangerous. The first danger is to your fingers and hands. If you are new at cranking glow engines, then go out and buy yourself an electric starter or at least a 'chicken stick'. This will save you a few badly banged fingers, or badly sliced fingers from the back side of a plastic prop.

Next, when you have your engine started, be doggone careful of how you reach around to tweak the needle valve. If you're not careful you can stick your hand right into the prop, or, if you reach around the prop, you can get a nasty slash on the wrist. Always try to adjust the needle from a position behind the propeller. Also, be careful that you are holding the aircraft tightly so that it cannot escape from you while you are adjusting the needle valve. If you have a beginning helper, such as a youngster holding your airplane for you, keep your left hand on the airplane too so that a sudden release by the holder won't let the aircraft jump into you.

Now, for props themselves. If you are a new pilot you will quickly find out that props are a major expense to your flying. You may be tempted to switch from wood props to plastic after a few wooden ones are broken. Plastics are great as long as you do not use them on .60 size engines, or high revving racing type engines. Plastic blades have been known to sling off while running and the natural target for that flying blade is right into your face if you are leaning over the arc of the running propeller. Plastic props are just fine for almost any non-racing type engine from .40 on down. If the directions on the prop call for boiling it to stress relieve it, by all means take the time to do so.

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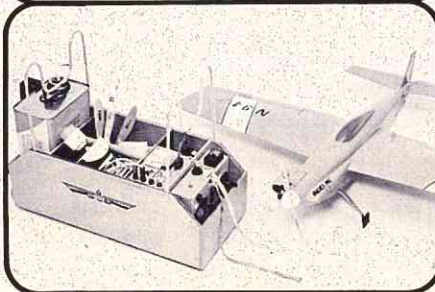
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RADIO SPECTRUM

from page 12

can cause personal injury and/or loss of an expensive airplane. No explanation required.

(2) **Mission Success:** Whether we're in the finals of the World Championship or have just driven to our favorite slope for a relaxed afternoon of soaring, a malfunction that prevents us from meeting our objective will make us unhappy, to say the least.

(3) **Unscheduled Maintenance:** If we're right in the middle of our flying season and our system fails, requiring a trip to the factory, it not only costs us for the repairs, but our system is unavailable to us, which also causes gloom.

Okay, reliability is important. Can anyone do something about it? The answer is yes. According to the literature it is a quantitative characteristic that is predictable in design, measurable in test, controllable in production, and sustainable in the field. The design establishes the "inherent" reliability potential of a system. Subsequent life cycle activities can only degrade reliability below this inherent level. In order to achieve and sustain acceptable levels of operational reliability, positive action must be taken throughout a system life cycle.

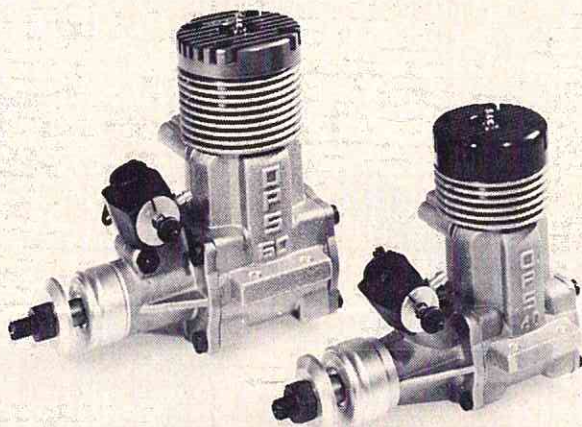
Let's define the term "reliability." It is the probability that a hardware item (i.e. system, component) will satisfy its performance requirements for a specified time interval under operational conditions. The definition stresses four elements; probability, performance requirements, time, and use conditions.

Probability is the likelihood that an event will, or will not, occur. It is a quantitative term expressed as a value between 0 and 1 or as a percentage. Performance requirements define what is considered to be satisfactory operation. Time is a measure of the period during which we can expect satisfactory performance. Operational conditions represent the environmental conditions under which we expect the item to function. We would like the probability to be 1 (100%) that our system would meet all its requirements, all of the time, under all environments.

Let's take a closer look at that word, probability. It implies that the result of an action is not known for sure but is predictable based upon the results of similar actions. If you've thrown the switch on your transmitter 500 times and it always came on, there is a high probability it will come on the next time. However, if you take your new plane out and miss the spin the first time you try it, you cannot conclude that the probability of spinning that airplane is low. Even if all systems built by one manufacturer are built exactly alike they

to page 116

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from page 10

The Husky Jr. was manufactured by a gentleman named Homer Conklin in Seattle Washington. The name "Husky" coming from the University of Washington Huskies which was nearby. The first Huskies were made in 1937 and production continued through 1947. Any of the pre-WW II Huskies are considered prized collector's items today — one of the few engines that I do not have in my own collection.

Both the McCoy and Dooling, up to a couple of years ago, were the equal of any of our present R/C engines. However being designed as racing engines with large ports and advanced timing did not convert too well to R/C use. The McCoy could be converted with the installation of a carburetor and exhaust baffle and would perform quite well. The Dooling, being of large bore and very short stroke, was intended to develop its horsepower at a high rpm with a flywheel or small prop and did not lend itself to R/C use. However with the recurrence of tethered line car racing the Dooling has again been the number one engine up until just this past year where the piped OPS engines seem to have finally unseated the King of racing engines. The Dooling was probably one of the finest engines ever made.

As for the Muff-L-Aire's running hot, many fellows have complained of this, but this is only a matter of negligence on the part of the operator. You have to clean the carbon and varnish build-up from between the plates occasionally.

I guess the single versus the double blade prop controversy goes back to the very first wind-up rubber models. There are arguments for and against both. I ran single blade props myself when active in U-Control speed following WW II. Several top speed fliers had good success using them but the two blade props seem to always come out working the best. Single blade props can cause the nose of the airplane to gyrate which is their main shortcoming, and this, in turn, can result in a loss of efficiency.

Dear Mr. Lee,

I just paid \$13.75 for a gallon of model airplane fuel. My wife fainted when she found out about it. I would have caught her but my knees were still rubbery.

Desperation has joggled my memory. I recall reading an article on using a white gas/motor oil mixture as a substitute for the methanol castor fuels.

I am hoping that you were the author of that article. If not, then I feel sure that you know about this gas/oil fuel. As I remember it, fuel consumption was greatly reduced. This came from a leaner mixture of fuel-air (right?). Power was significantly reduced but I can't remember how much.

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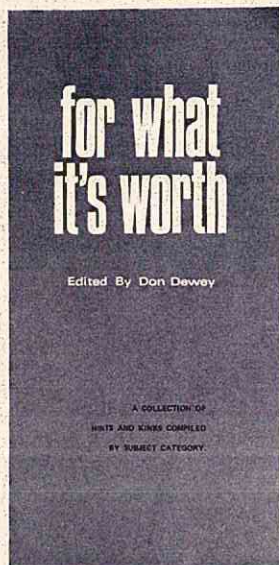


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RADIO SPECTRUM

from page 112/12

will not have the same mean time between failures (mtbf). Some will fail more often than others and some will indeed be 'lemons.' Even if you had a number of systems with the same mtbf the time to the first failure would not be the same for all those systems. In order to establish a probability of success you must have a large sample of data on a large sample of systems. Therefore you cannot conclude that Brand X is bad based on a limited evaluation of one Brand X system.

I don't think we have to go into performance requirements any further except to remember that we are not only considering catastrophic failures but also those that keep us from completing our mission. A servo that won't neutralize, or that changes throw, might be a good example of this type of failure.

We do, however, have to discuss the element of time as it applies to reliability. Consideration is given to three discrete periods in a system life. These are shown in Figure 1. When someone describes a system's reliability he is assuming that the "age" of the equipment is between Tb and Tw, that is, it has gone through burn in, but is not worn out.

The last element, the use conditions, is probably the largest contributor to the variations in reliability for a given brand of radio. We have some extreme environmental conditions in our model airplanes and the modeler can do a lot to minimize failures due to these environments and thereby head off a lot of failures.

Getting back to Mr. Recesso, and armed with all this knowledge we can suggest the following as possible reasons for his problems:

(1) The systems he bought may have been poorly designed and may not have high inherent reliability. This is probably not the case if the manufacturer is still in business.

(2) The system may have been poorly constructed when compared to the systems which established the inherent reliability. Often a manufacturer will establish a reputation for a reliable product and then relax quality control when he expands into full production. Once again he probably won't stay in business long.

(3) The systems may have been in that category that are considered 'lemons.' The chances of getting lemons three times in a row are highly unlikely.

(4) Mr. Recesso may have performance standards that are unreasonable. This is probably not the case because the problems he described were real, such as glitches, interaction, batteries dead and servos not working.

(5) His systems may not have been burned in properly or they may be worn out.

(6) He may be expecting a mean time

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RADIO SPECTRUM

from page 116/12

between failure that is unreasonable. He indicates that he thinks one trip to the factory every six months is too many.

(7) He may be using the equipment in an unreasonable manner. His installations may be bad, he may not be caring for his batteries, or he might not be keeping the equipment clean. There is some evidence in his letter that he doesn't use the equipment regularly. My experience is that you've got to be very careful of batteries and servo motors after they've been sitting around.

(8) He may not really be complaining about reliability at all, but is upset over poor performance, bad service, and excessive service charges.

We must also recognize that reliability is a relative thing. There is no question that systems being produced today are more reliable than those produced a few years ago. They are also very reliable when compared to other equipment of the same complexity that has to operate in the same

environment. We should not speak about a system being reliable, or not reliable, but we should relate a particular system's reliability to something else for which we have a feel. After Joe has flown, or attempted, 500 flights and has experienced a much higher failure rate than his buddies with the same equipment, he may conclude that his system is less reliable than their's, but he should not conclude that the brand is unreliable. If many people are having similar problems with that brand compared to other brands, then it could be called unreliable.

In future issues we will try to establish a feel for what might be considered good reliability. We can go through a sample reliability prediction and you can then see if your equipment is better or worse than what might be predicted. We will also try to give you hints on how to maintain the inherent or potential reliability the manufacturer has designed in.

RCM Dual Charger Vs. Flite Life

Scott Orten of Grafton, Wisconsin, built an RCM Dual Charger and went along in blissful ignorance until he bought a Flite Life discharger. The Flite Life showed his

batteries were weak so he replaced them. He found the new batteries weren't much better. About this time he decided to try the manufacturer's built-in charger and what do you know, he got twice the capacity. Scott says "How come?"

Well I'm afraid the score is Flite Life 1, RCM Dual Charger 0. There are a couple of things wrong with the RCM Dual Charger. It has a fixed output voltage that is too low to insure even a .1C charge rate at all temperatures. You may recall we mentioned that the voltage of the cells is a function of temperature. Fig. 2 shows this relationship.

You can see that if the charger is set at 1.35 volts per cell you can't charge the battery at all at low temperatures because the battery voltage is higher than the charger voltage. The second important characteristic of the cells that wasn't considered in the design of this charger is the fact that charge rates below .1C are not effective in utilizing the full capacity of the cell even if the charge time is abnormally long. This is illustrated in Figure 3. You can see that if you charge at 20ma (.025C) you never will get the full capacity. My advice on the RCM Dual Charger is to crank up the



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output voltage and set the current limit to give a continuous .1C charge rate.

We'll try to come up with some ideas on how you might modify it to outperform the built-in charger, but for now be satisfied to make it equal the built-in charger. In the future we'll do our best to head off publication of any circuits of questionable worth.

Bob Aberle of Hauppauge, New York, whose name you've seen from time to time as a contributor to various periodicals, sent us a nice letter with some good suggestions. He recognized the need for a voltmeter on the Flite Life and recommended installation of a connector so you could plug in your own voltmeter. What he would really like to

see however, is a construction article on an integrated unit that would include the features of Flite Life, and expanded scale voltmeter and a battery charger. I will be glad to publish circuits for these items but I do not have time to prepare construction articles. I think most guys who can build their own equipment can work from a schematic. If you can't, you're probably better off buying ready built equipment. I know Bridi Hobbies plans to market this type of battery charger/test equipment with a modular approach. That is, you can buy one or more modules and eventually build up to a completely integrated system. Perhaps Ace or Royal will make parts kits available for those who want to do their own

thing.

Bob sent a copy of page 50 of the March 1972 RCM that showed a modification of Darrell Yonker's battery tester, which performs a function similar to Flite Life except that it is set up to test one cell at a time. For the purist, this is the best way to do it, but it means bringing out a wire from each cell of your pack. Of course the circuit could be modified to trip at 4.4 volts, and test the whole pack at one time. I didn't find the original article on Darrell's tester but there must have been a mistake in the schematic. The March 1972 article said that the circuit continued to discharge after the Schmitt triggered. I have Darrell's original

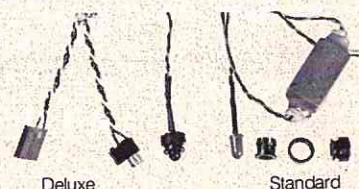
to page 122

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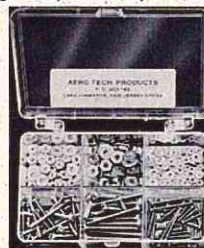


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RADIO SPECTRUM

from page 120/12

schematic and it clearly shows a relay contact in series with the battery which will cut the current to zero when the relay drops out, similar to the March 1972 modification. Darrell's circuit was better from a cost standpoint because he simply used a second set of contacts on relay (A), thereby eliminating relay (B).

We've had a couple of inputs from modelers regarding the connection of the Flite Life to the Blue Max transmitter. (I'm beginning to think we should have named this column "Flite Life.") Rather than describe the various configurations I think it should be adequate to say that no matter what kind of system you've got you must connect directly to the battery without any other components which cause a voltage drop in series. Switches and connectors are all right.

Another question asked, is can it be used on 12 volt transmitters? The answer is yes, but it requires modification.

Keep those cards and letters coming but please save your self addressed envelopes, stamps, and dollar bills. I can't answer the letters on an individual basis. I also recommend you write directly to the manufacturer if you have a specific question about his equipment. You will get a much quicker answer because we have long lead times and limited space.

ENGINE CLINIC

from page 115/10

I would like to know what the formula for this fuel is and if it is hazardous, unhealthy, illegal, high in cholesterol and just might ruin a perfectly good engine if used.

Not only am I a Cheapskate, I am a desperate one. I would appreciate any help that you might be able to give me.

Thank you very much.

*Respectfully yours,
Robert A. Burton*

Many fellows are facing the same dilemma as you Bob, but going to a gasoline/motor oil mix is not the answer. Although a 3-to-1 mix of white gas and SAE 70 motor oil (usually Valvoline) was the standard fuel mix back in the ignition days it just isn't suitable as a glow fuel. In the ignition days engines seldom exceeded 7,000-8,000 rpm. When they did start to develop engines that would turn faster the change to methanol alcohol/castor was also made. A glow engine can be made to run on a gasoline/motor oil mix with the addition of a small percentage of nitro propane, however the power is down, the engine runs hotter, etc. Some time back during the fuel

to page 124

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ENGINE CLINIC

from page 122/10

crisis methanol also became in short supply so fuel manufacturers started looking for substitutes. Several were found but costs remained pretty much the same if not higher than methanol. As I have mentioned many

times in past columns, the use of a gasoline base fuel is not going to save as much as you might think. Alcohol runs 90 cents to about \$1.20 a gallon depending on the source and part of the country where you live. Gasoline is around 60 cents. If you are going to use gasoline then one of the synthetic oils would work much better than automotive motor oil and this you use in either a gasoline or alcohol mix. Same for the nitro — with

alcohol fuel you use nitro methane and with gasoline fuel, nitro propane. Costs are about the same. So the only savings is in the difference in costs of gasoline and alcohol — 30 cents - 60 cents a gallon. It is true that the gasoline mix would give better economy, but at the loss in performance. The gasoline mix, due to its leaner running characteristics, also means hotter running

to page 127

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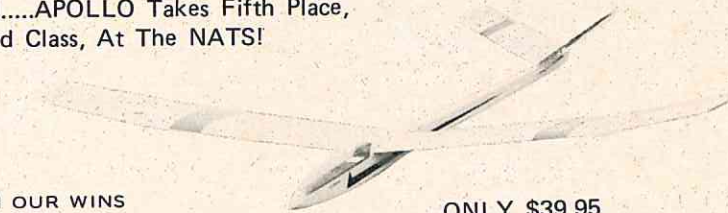
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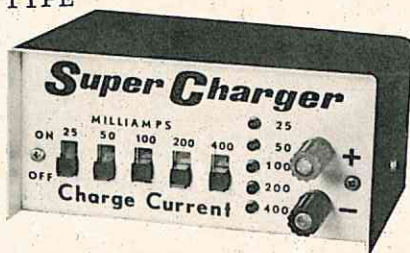
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ENGINE CLINIC

from page 124/10

and increased wear. You are better off sticking with the alcohol/castor or synthetic mix.

Now as far as lowering your fuel costs, you can save considerably by mixing your own fuel or by buying the commercial fuel in larger quantities. Most all of your commercial fuel manufacturers will sell their fuel in 55 gallon drums. A group of fliers, or a club, can save considerably by purchasing a drum, which would be my

recommendation to cut fuel costs.

Dear Sir:

My S.T. G15 - front rotor, side exhaust runs well at the top end and also idles well, but at idle, runs sloppy dripping wet. Any attempt to lean out the idle needle causes the engine to start a screaming high speed run even though the barrel is almost completely closed. Also at high speed the idle needle creeps quite rapidly. I have not been able to correct or improve these conditions, so I ordered and installed a Tarno carb. The Tarno fits the opening smoothly and snug, but does not bottom far enough to compress the gasket. Using the Tarno gasket plus the original S.T. gasket results in a slight

compression. I have not yet tried running the engine with the Tarno because I suspect the engine so equipped would be disallowed for Q.M. racing, and I feel that I should try to correct the S.T. carburetion with original carb.

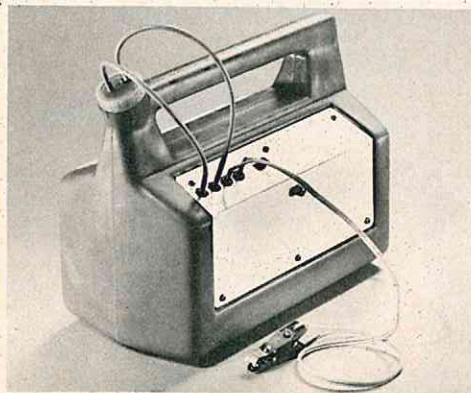
The Tarno carb appears exceptionally large for the .15, somewhat like "the tail wagging the dog."

I am now thinking that I may try to use the Tarno on one of my Enya .29 engines. If it is adaptable, will it have enough capacity for a .29?

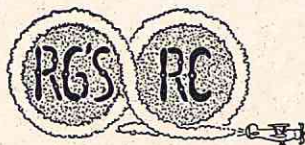
Any suggestions will be gratefully received.

Very truly yours,
Charles Woodmansee

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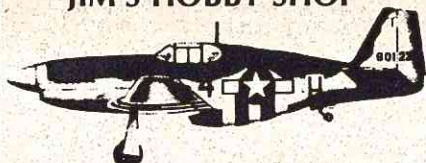
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If you are having trouble with the needle creeping at high speed it is due to excessive vibration. Better check the balance of both your propeller and spinner. If you have ever bounced the nose of the airplane off of the ground there is a possibility that you may have bent the crankshaft so also check this for run out. Vibration may have worn the carburetor barrel so that you now have an air leak which would result in the difficulty in getting a setting. All engines idle a little sloppy, racing engines more than sport engines. This is due to the late closing of the intake timing. With late closing timing you are going to get considerable blow back through the carburetor at idle. There is a possibility that the exhaust baffle may be too tight. A tight baffle will cause considerable blow back at the carburetor. Try loosening the baffle slightly and see if this helps the problem. You do not want it too loose, however, as it will then lose its ability to keep the plug hot.

The .15 size Tarno would work okay on the Enya .29 but you would realize a slight power loss due to the small venturi size. If you do intend to use it on the .29 I would recommend drilling the venturi out to the same size as the stock Enya .29 carburetor.

Dear Mr. Lee,

I can adjust the Perry carb on my Veco .19 so that I get a good idle without loading up and a good high speed setting. However, as I am flying, if I put the throttle in its middle range, the engine loads up like crazy. It sputters for one or two seconds when I go back to high. I am using Duke's fuel, TF 8/6 nylon prop, no muffler or exhaust baffle, and a KH mount. The plug is long with idle bar. The CL of the carb is about 1/8" below the top of the 4 oz. KH tank. The tank cannot go higher and still be inside my Flee Fli plus ten.

I had a similar problem (loading at mid-range) with the Perry carb on my OS .40. Putting muffler pressure on the tank solved it. Are these carbs tuned to work best with muffler pressure?

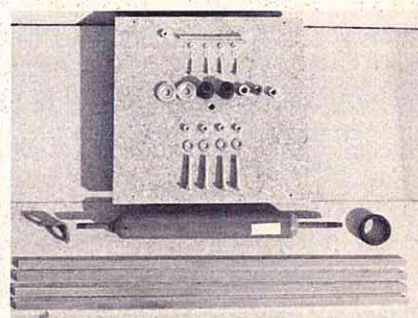
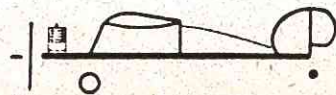
Thanks for your great column.

Jeffrey D. Ives
Rome, New York 13440

Jeffrey, the main function of the exhaust baffle is to keep the glow plug hot for good idle and acceleration. By removing the baffle and not using a muffler you can expect nothing but acceleration problems. That is why the engine came with a baffle to begin with. If the baffle was not necessary the engine would have come without one. If the baffle is removed then a muffler should be used as it creates slight back pressure and heat to keep the plug hot. Put the baffle back on the engine!

I would guess that the use of muffler pressure helped your OS .40 due to the slight pressure helping to bring the fuel to the carburetor which allowed you to lean the needle in a little farther. This, in turn, leaned the mid-range slightly as well. No internal changes are necessary in a

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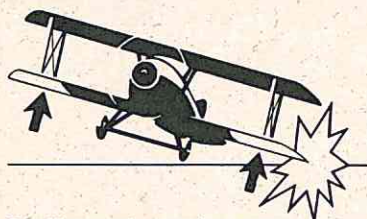
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carburetor, Perry or otherwise, for muffler pressure as it is very small. The venturi of a carburetor can be enlarged slightly if muffler pressure is going to be used but this is rather difficult to do with the Perry due to the pressed-in spray bar tube.

Dear Mr. Lee,

I am writing concerning a problem I am having with a Fox .25 RC. It runs great at full throttle and idles well but will not run at mid-range. It makes the transition from low to high throttle fine, even after idling for more than a minute. At mid-throttle it seems to lean out after about 15 or 20 seconds running. If given full throttle when it starts to die it quits completely. If idled when it starts to die it will continue running and can then be given full throttle.

The engine was broken in, per your recommendations, has good compression and has had about two gallons of fuel run through it. I might add, that it did not have this problem when it was new and it seemed to develop slowly. I have disassembled the engine and cleaned all of the varnish off the piston, etc. I run it with a Fox muffler and swing a 10/4 prop. I tried a 9/6 and it does the same thing. I have adjusted the idle mixture leaner and richer and no change. I have run the full throttle mixture rich and lean and the condition remains. I have checked the tank position and its centerline is slightly below the needle valve assembly. I use a fuel filter in the fuel line and it is clean. I have not disassembled the Fox carburetor but have checked it and it seems to be clean.

Any help will be appreciated.

Thank you,
Jim Polozeck

Sounds as if the exhaust baffle is choking off the engine at mid-range. When you were cleaning the engine did you clean the inside of the exhaust stack and baffle as well? I'll bet you didn't and this is your problem. The use of a muffler has created enough carbon and varnish to effect the fit of the baffle. If a baffle is too tight it will keep the engine from bypassing fuel into the combustion chamber and die lean even though excess fuel will be spraying from the carburetor, leading you to think the engine is idling too rich. A tight baffle will let the engine idle okay as the rpm is low. As the engine speed is increased the pressure builds up and the baffle restriction is too much. Also be sure to check the relationship between the opening of the carburetor and the baffle. Possibly the linkage has gotten bent so that the baffle is remaining closed longer than it should. With the carburetor opened slightly the baffle should be straight up and down.

With in-flight mixture control becoming more popular fellows have been looking for easy ways to accomplish this. Both Perry and Kavan market mixture controls for their carburetors. However fellows using Webras, Enyas, H.P.'s, etc., have to fabricate their own. V.A Bird from Calgary Canada sent in a simple set up that can easily be made that works very well. □

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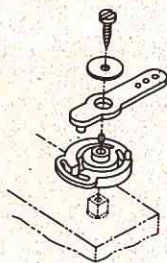
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OPEN LETTER

from page 6

solution does not add to progress for the general welfare but simply multiplies the original problem.

The model press has made great contributions to the entire sport and hobby of model aviation in current years and for many years before I was ever involved as a magazine editor. And I would defend with every possible resource at my disposal the right of that press to freedom of speech. But, every freedom must always be balanced with responsibility. Criticism, when justified, is always a necessary part of freedom of the press but it must **always** be tempered with a positive approach towards solving the problem that prompted the criticism. For wherever there is a problem, there are people involved — human beings with feelings just like our own and those human beings, when criticized constructively, will respond with a positive reaction if that criticism is tempered with sympathy and understanding.

These are the ingredients to freedom of speech and freedom of the press. Without them, we have only a negative mockery of the responsibilities attendant to them.

The power of the written word is a tremendous force and can be used for positive constructive criticism and action or, alternately, for negativism and destruction. If we believe in the latter, there is no place for us in the public arena. A loss of respect for the model press on behalf of its readers would destroy the main line of communication in this sport and hobby and, without that line of communication, model aviation would be short lived, indeed.

Let's begin to live up to our responsibilities. We have filled a great many pages over the years with words about breaking down the "toy airplane" image. Unless we begin to act like adults, approaching our problems, responsibilities, and our criticisms, with a positive approach towards building a better future for model aviation, that future will be in serious jeopardy.

Let us, each one of us, learn to adjust to what is; and not keep trying to adjust everything else to our own desires.

Let us learn to enjoy what is right and just and, to believe that, as we give to the world, so the world will give to us. □

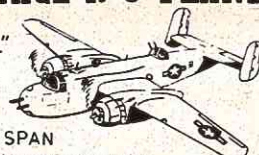
FROM THE SHOP

from page 2

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bonded together, who's to haggle price! Like everything else, DMF should be only used with adequate ventilation and avoid prolong contact with the skin. Somewhat safer, but at two to three times the cost is DiMethyl Sulfoxide.

Our thanks to Dave for bringing this to our attention. By the way, if you use an agent such as Pro-Tek on your hands — a material that is used by industrial workers and available at outlets such as Sears and most hardware stores — you'll find that you have an invisible glove that will in no way inhibit your working, but will certainly prevent this type of adhesive from sticking to your hands as well as protecting your skin from the drying effects of dope thinner, alcohol, and the like.

★

Bob Beecroft, president of the San Diego Orbiters FFMAC forwarded the following and most welcome letter:

Dear Don:

*I just thought that you might be interested to know that not all your readers are RC flyers. I'm a dyed in the wool, hardcore free flyer, and I buy your fine publication with great regularity at my local hobby dealers. What does a free flyer find in an "all RC" magazine? More of the FF fraternity should open their eyes to your magazine (and not automatically skip over everything that is not labeled in block letters **Free Flight**). This month's RCM (December) has for the free flyer, articles of interest from page 2 on. Your column has a note about the new cyanoacrylate solvent now available. Clarence Lee always has valuable tips. Very interesting reading in Sunday Flyer, especially about prop efficiency and the speed of models. "Scrape the Weight Off" is a valuable tip for all of us. (I use glass on all my power FF models, to strengthen and fuel proof the front ends, and don't need any extra weight.)*

Baby Ace is interesting reading and would make a great FF scale. And the article on the Gee Bee and a Visit With The General is one no one interested in aviation should miss.

Articles on sailing are always of interest and value to the FF'er, as are articles on construction tips and airfoils like in Platt's column this month.

*I've extolled the virtues of your mag to my club members at various times in our newsletter, El Torbellino, perhaps to no avail. Too many people read **Radio Control** modeler, and don't bother to open the mag. More people should open their eyes and read radio control **Modeler**.*

Thanks for your time, and for the good magazine.

Bob Beecroft

Thanks for your kind comments Bob — we never really thought of other than RC'ers reading the magazine, but we certainly appreciate what you had to say and will keep this in mind in future articles.

★

See you next month.

POXY POINTERS

Hi, paint freaks,

One day not too long ago while I was standing outside the hobby shop with my nose pressed to the glass, recalling the good old days when I could afford to buy balsa, this nut I know rushed up behind me, grabbed me by the throat and wailed, "John, John, the entire universe cries out to know if there is any way to make Hobbypoxy White Undercoater dry faster and sand easier!" He tends toward exaggeration. He also tends toward impatience. It's for this guy that ARFs were created ... but if he has to spend more than 30 minutes assembling one he calls it scratch building. However, as he was about to modify the hobbyshop window with my nose, I figured it would be best to humor him. So I went back to the dungeon to see what I could come up with.

One of the things I came up with was the suspicion that very few builders have enough time on any given evening to do more than give a model a proper and careful sanding, wipe off the dust, and apply a coat of Undercoater. So even if the material cured in four hours, the average guy would be up until the end of the Late Late Show before he could sand it. What I'm saying is, most people's daily schedules force them to wait at least 24 hours between coats ... so what difference does it make whether the material cures in four hours or twelve? And since two coats will give you a smooth surface, it'll be only two nights anyway. Is that so terrible? Would it be better to use a material that cures faster and requires four coats for the same results?

Another thing I came up with is the fact that under normal conditions Hobbypoxy White Undercoater isn't going to cure in less than eight hours. Oh sure, you could play around with heat lamps, or heat the material before application, and you might cut an hour or two off the time, but for the average guy with a brush and a tin can the cure time is going to be about eight hours.

Wait! Before you grab my throat again! I did discover a way to make White Undercoater even easier to sand ... and save a little money too. The Boss might fire me for this, but here goes: You can mix two parts of White Undercoater to one part H-02 (Gloss) or H-06 (Quick Spray) Hardener. That's right, two to one. **NOTICE!** Do not use H-05 Flat Hardener with White Undercoater! Not even if it's a dark and stormy night and you're out of H-02 and H-06 and the Nationals is a week away. Flat Hardener will cure okay, but the film strength will be below standard.

The two-to-one mix will cure in about the same time, film strength will be about the same, but sanding will be easier than with the normal one-to-one mix. Whichever you use, you'll have the strongest epoxy base coat you can get.

See you next month,

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