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FEATURING

1982 TOURNAMENT OF CHAMPIONS

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RCM MODELER

VOLUME 20 NUMBER 2 USPS 509190 ISSN 0033-6866 FEBRUARY 1983

THIS MONTH'S COVER

comes to us from Osaka City, Japan. Miss Sachko Takamatsu is displaying the outstanding 1/4 Scale Christen Eagle, kitted by Pilot of Japan and distributed by Hobby Shack in the U.S. Incidentally, Sachko is the daughter of Pilot President, Mr. Takamatsu.

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FROM THE SHOP

Don Dewey

HELP! We are swamped! For years we have taken a great deal of pride in answering letters from our readers. The last two years have brought a tremendous increase in our mail from modelers requesting assistance on technical questions, research, sources of materials, etc. This situation has created quite a serious problem for our editorial staff members who are qualified to provide the appropriate answers. It is simply a matter of available time, therefore, we are compelled to revise our policy on this subject.

The following procedure must be followed for a personal response from our editorial department. State the question clearly and briefly so the answer can be handwritten in the margin, on bottom of page, or on reverse side of page. Enclose a Self Addressed Stamped Envelope (SASE) with your letter. This is much faster for our staff than in working up a formal reply. We are happy to help you if you will help us. The punch line is SASE, no SASE, no answer.

This procedure only applies to our editorial department, not our business office. Letters to our monthly columinsts in which a personal answer is desired must include a SASE, otherwise the request will be answered in their columns if considered to be of general interest. We regret having to adopt this policy but our first priority is to get each issue of RCM published on schedule which limits the time available for other services. Thanks for your cooperation.

★

We received the following letter from Jim Moynihan, Aerolite Products, Inc., 1325 Millersport Hwy., Buffalo, New York 14221:

Dear Don:

In going through the November 1982 issue we noticed an article by Gene Stottrup on How to Make Fiberglass Molds and Parts. I am sure he didn't mean to be misleading but in the article he mentioned using a release agent called MS-122 and gave the readers the name and address of the manufacturer. They will only sell to bonafide industrial corporations and the cost of the material is $5.50 per 16 oz. can in minimum quantities of four cans per product.

The purpose of this letter is to advise you and the modeling fraternity that we do carry MS-122 release agent in stock. It is possible for the modelers to buy from us at $5.50 per can plus $3.00 shipping and handling charges which apply to any of our products.

The article is very good and we enjoyed it very much and wanted to bring this fact to your attention. Of course, we also carry various Kevlar and Carbon Fiber tapes and fabrics.

Very truly yours,
James A. Moynihan Sr. P.E.
Aerolite Products Inc.

FCC Approves New R/C Channels

After four years of concentrated effort on the part of AMA and the R/C Frequency Committee, the FCC has approved their proposal for new R/C channels. The actual vote took place November 4, 1982, at a FCC Commissioners' hearing in Washington, D.C. The process of obtaining these new channels was certainly a difficult and painstaking experience, but in the long run was worth it considering the ultimate result.

The new FCC R/C rule became effective prior to January 1, 1983. The AMA received almost everything the FCC proposed in its April 1 Notice of Proposed Rule Making (NPRM). Noteworthy is that we will be permitted the use of "any type" modulation (AM, FM, or whatever evolves in the future) provided that it meets the necessary FCC type acceptance approval.

The AMA HQ staff is distributing a new Frequency Identification and Control System plan which will help you understand the exact nature of the new channels. Along with that, a four-color pair of summary charts has been released containing all the basic information on both the aircraft (72 MHz) and the non-aircraft (75 MHz) channels suitable as an easy reference document.

Our readers may obtain this material by sending a written request and enclosing a legal size Self Addressed Stamped Envelope (SASE) to Academy of Model Aeronautics, 815 Fifteenth St., N.W. Washington, D.C. 20005. Phone (202) 347-2951.

The next step is to implement the AMA plan for gradual transition to the new frequencies. The plan has been carefully worked out to permit the old and new 72 MHz frequencies to co-exist for the next five years. Any attempt to try to introduce more new frequencies sooner could be disastrous. It's necessary, therefore, for those concerned to read and discuss the FCC Report and order carefully: The FCC is authorizing more frequencies than can practically be used at this time. They have given us enough for many years down the road if we use them right.

One important caution: on page 8, item 24 of the FCC Report and Order, it is implied that frequency changing is possible as had been originally proposed by the Academy. That's not quite so. AMA had asked for the ability to change frequency modules **or crystals,** but when the NPRM came out this was not included. The Report and Order reference (R/C Rule 38c) permits "removing and inserting a plug-in module that is part of a type accepted R/C transmitter," but it does not refer to crystal changing by itself.

The AMA's legal counsel's interpretation is that frequency changing by crystal swapping alone is only permissible if it involves a unique crystal configuration which is not interchangeable between manufacturers because it is common only to the specific transmitter design which a manufacturer has gotten type

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SUNDAY FLIER

Ken Willard

Photo 1.

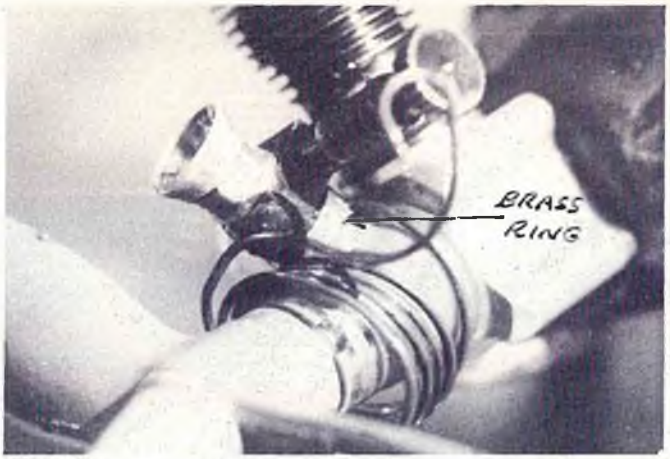

Photo 2.

Happy New Year! As I write this column, it's the first week in November, but due to lead time, by the time you get this issue it will be early in January 1983, so get ready for a great year of flying and lying!

All you Sunday fliers have been very responsive to my pleas for interesting letters and stuff, for which I want to thank you, and hope that in the coming months you will continue to write and send photos of your projects. Remember, this is **your** column; I'm only supposed to be the editor, occasionally putting something in that's controversial so we can have discussions with each other on why airplanes do what they do instead of what we want them to do.

But first things first, for 1983. Recently I was forcibly reminded that once again, it's time for the bi-annual Dum-dum contest. Read this touchingly appealing bit of poetic lament from Mike Mintz, in far off Singapore:

From One Sunday Flier To Another

Ken,
When I was young and foolish
I did some crazy things,
Some I don't remember
But some a bell can ring.
But one I always think of
And blush with special shame
Concerns my J3 Piper Cub
And my subsequent ill-fame.
I wrote to you about it,
Bared my soul and all,
You printed an acknowledgement
That really made sure all
My friends would write and tell me
How crazy I had been . . .
But the prize that you had promised
Was never to be seen.
Now I can take a ribbing
Be laughed at by my friends,
But it makes it so much easier
If there's a goodie at the end!
So, come on, hide my blushes,
Send it off to me right now
So I can flaunt it to my buddies
And wipe the furrows from my brow.
Ta,
Mike (Chief Dummy) Mintz

At first, when I received Mike's letter, I had a great tinge of remorse. Mike, you may recall, won the last Dum-dum contest --- but he never received his prize. On checking this out, I felt better. Seems that we did send him his prize, but for reasons that only the post office can explain (which they couldn't) he never did receive the promised goodie. Well, we have done the best we could --- we sent him a copy of the Illustrated Plans Guide as he requested. Perhaps the mail service will come through this time. Sure hope so. Let us know, Mike.

Anyway, as I said, it's time for another Dum-dum contest. And, just to prove that I am the most qualified judge there is to determine the winner, let me relate this unbelievable, but true evidence that even Dum-dums have a patron saint who watches, winces, and forgives.

Photo 3.

Chief Dum-Dum Stikes Again!
Or, "The Raisers of the Lost R/C"

Last month I regaled you with a description of the fascinating seaplane fly-in at Clear Lake. What I didn't tell you about (I used "lack of space" as an excuse to myself) was the **dumb** thing that I did. So here it is.

The full scale seaplane activities were to start at noon on Saturday. During the morning, the Clear Lake Renegades set up a static show and R/C flying demonstration. As part of the show, I flew my little Poolboy flying boat --- twenty inch span, eight ounces weight, powered by a Cox .010 engine --- you know the one; the tiny jewel-like engine that swings a 3" propeller at 27,000 rpms. They don't make them anymore, so if you have one, treat it like the jewel it is. And I was trying to do just that, but my ego got the better of me. Not at first, but later on. The flight on Saturday morning was excellent; the Poolboy took off, flew around, did a few maneuvers, and then when the engine quit, I carefully positioned it so that when time to land came, it would touch down and coast back to the dock. As luck (and it **was** luck) would have it, the touch down was perfect, except for a slight bounce. Now came the unusual part. On the bounce, the

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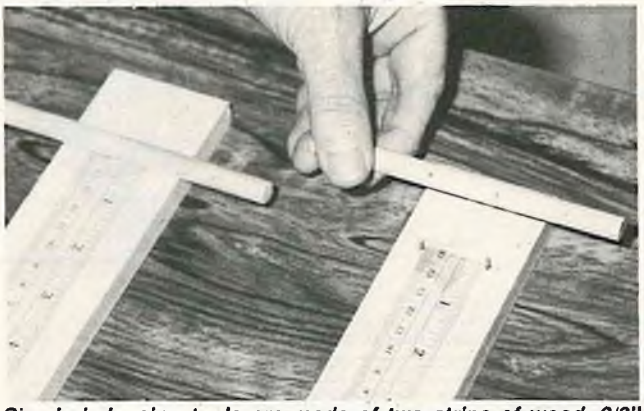
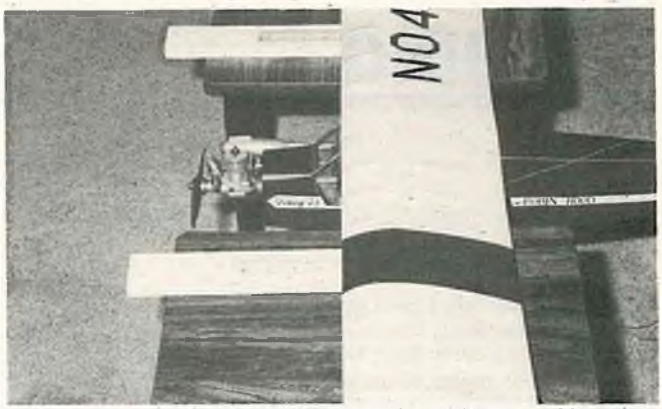
HERE'S HOW

By Jerry Smith



Simple balancing tools are made of two strips of wood, 3/8" dowel and two cheap plastic rulers. The headless nails keep the dowel in place and allow it to tip slightly for dihedral in wing. Note holes in dowel.



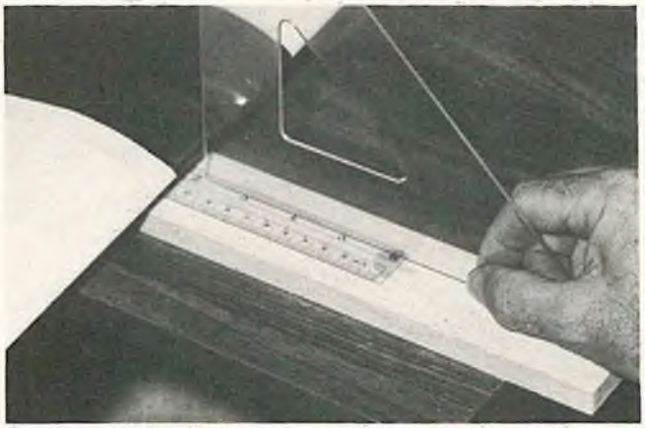
Place the aircraft on the balancing tools as shown, making sure they are in line. Balance aircraft by sighting in a level position. Low wing airplanes can be turned upside down.

How important is it to balance your airplane on the specified Center of Gravity? (CG). Well, if you're not interested in picking up all those little pieces at the flying field, you might pay more attention to proper balance. Balancing an airplane is not a difficult feat. The balance point is generally specified on the plans or in the instruction booklet in a kit, as a target mark on the side view. Sometimes a dimension will accompany the special target locating it exactly. I personally like this latter way of locating the CG. There is no question to how far it is from the leading edge of the wing.

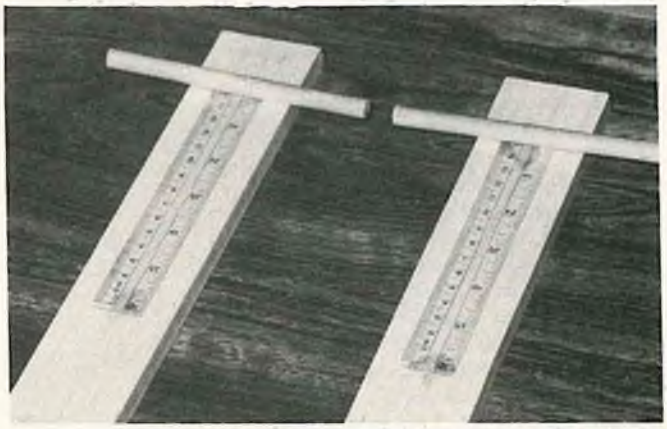
Because you built the airplane to the plans with exact care doesn't mean that when you have it completed it will be perfectly balanced and ready to fly. Undoubtedly a lot of beginners get into trouble because of this very reason. If the CG is too far aft, the airplane becomes unstable and will stall and snap before you know what has happened. On the other hand, if the CG is too far forward, the airplane may never get off the ground or you may not have enough elevator control to hold it in level flight. Either case, put this situation in the hands of a beginner and it will certainly cause disaster. Some pilots like to move the CG aft in order to make snap-roll and spin maneuvers easier to perform. Unless you are a skilled pilot, stick with the CG location recommended on your plans.

There are many variables in weight that take place during the building process. Heavy wood in the wrong place, too much glue used; too much finish on the rear and tail surfaces, servos and battery located improperly; these are some of the things that can cause your airplane **not** to balance when first completed. This is when you should get serious and take some extra time to properly balance your model. Before flying — ya' hear?

I have a good friend who is crazy about aerodynamic numbers. He certainly is a whiz when it comes to calculating just about anything you want to know with regard to aircraft flight. One of the interesting things that came out in discussion one day was; airplanes with full symmetrical wings have a different CG balance range than airplanes with a flat bottom wing. This is due to the fact that the center of pressure on the full symmetrical wing does not change with angle of attack — whereas the flat bottom wing center of pressure does change with angle of attack. A good CG range for the symmetrical wing is 26-30% of the cord while the flat bottom wing is 29-33%. You will find a difference of roughly 4% between the two wings. The semi-symmetrical wing, of course, should fall somewhere between, 28-31%. Kind of interesting, huh? My friend knows what he is talking about. So take heed. □



With a straight-edge against the leading edge of the wing, read off the distance from the balance point. Both sides should read the same. Divide the number on the ruler by the wing chord to get the percentage of CG with respect to the chord.



Simple balancing tools made quickly and easily. These little beauties will tell you when the balance point (CG) is with respect to the wing chord.

SOARING

Al Doig

This month I started out to whine about the high cost of contest entry fees. But, when I got it down on paper, it sounded kind of dumb, so I wadded it up and made a basket and started over. The thing that started me on that path was adding up my entry fees for the year and finding that I had spent $135.00 on contest fees. I guess if I added up the green fees for golf, I'd find it not so bad after all. Anyway — it does seem a bit much to lay out $15.00 for a two day contest. With the economy as it is, a bunch of guys really can't afford that much. Maybe we ought to back up to plaques and ribbons instead of the expensive trophies. What do you do with them anyway? The big guys must have a whole garage full of them. Oh well, I seem to have gotten one foot back on the soap box after all.

★

I received a letter from Jack Cash, Jr., of Walkersville, Maryland. Jack has made some worthwhile modifications and additions to his Sagitta 600 that he would like to pass on.

1. Addition of a releasable towhook: *Rocket, Sailplane Specialties, and Fourmost towhooks were all tried and all had interference problems with the servos, bulkheads, or both. The Fourmost towhook was chosen because of its compact design and because it required the smallest servo throw to release. The accompanying sketch (Fig. 1) shows the modifications made to both the model and towhook. I will only add that the plywood support rails should be epoxied to the fuselage bottom and bulkhead. Do not substitute materials or skip the step altogether, since these parts become vital to the model. I would not be surprised to see a towhook and fuselage bottom, minus the rest of the plane, going up the winch line if this recommendation is not followed.*

2. Extended stabilizer bearing tube: *As with all models which use a full flying stabilizer and a short bearing tube, the Sagitta's stabilizer wobbles quite a bit. This is due to the difference between the bearing tube inside diameter and the music wire outside diameter. Two things can be done to eliminate the wobble; reduce*

FIGURE 1
MODIFICATIONS TO SAGITTA 600 TO ADD RELEASABLE TOW HOOK

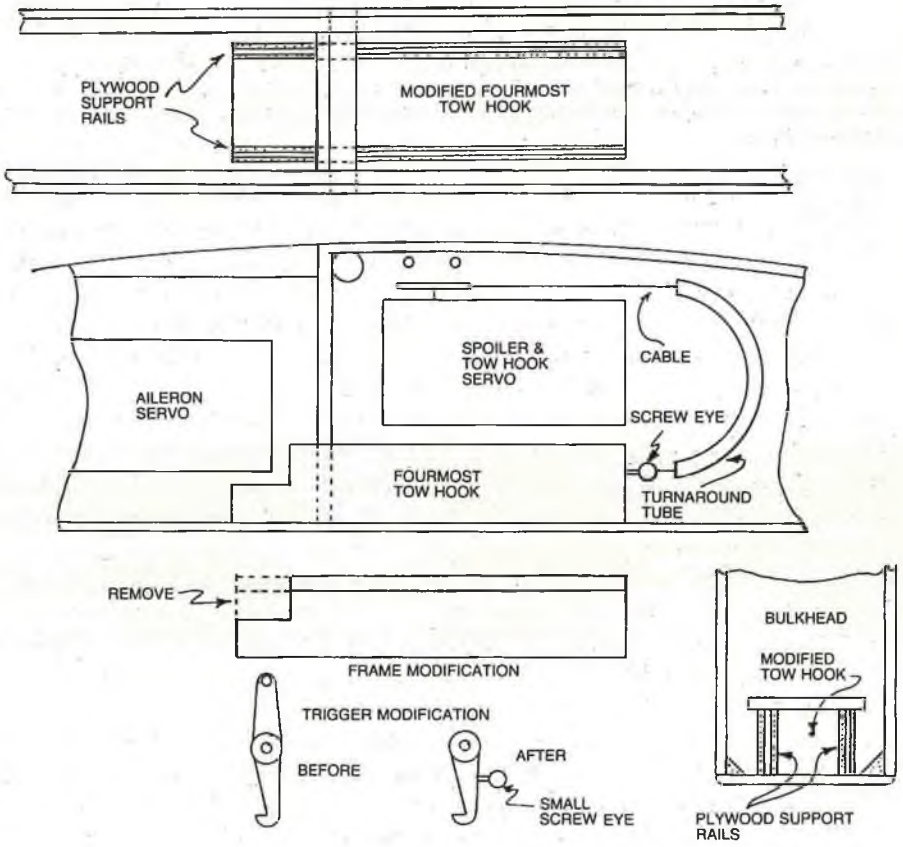
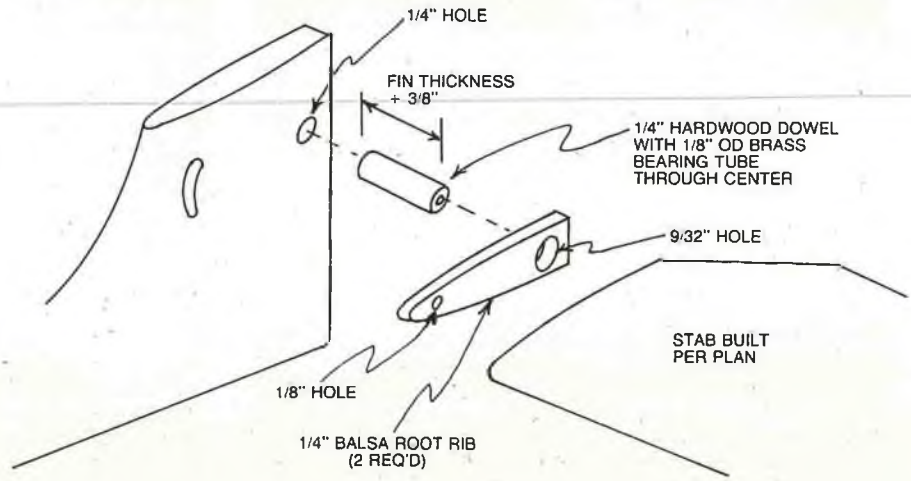


FIGURE 2
SAGITTA 600 MODIFICATION TO PREVENT STAB WOBBLE



the difference in the diameters, or increase the length of the bearing tube. Since music wire and brass tubing come in standard diameters, it is not practical to try and reduce the difference in their diameters. Extending the bearing tube is practical and relatively simple. The accompanying sketch (Fig. 2) shows the technique used. I will only add that drilling a 1/8" hole through the center of a 1/4" dowel is best done with the aid of a drill press and a sharp bit. This idea is not my own. At a recent fun-fly I saw a Sagitta 900 with a similiar modification which I copied. (I do not know the origin of the modification.)

★

From "Hear Ye," newsletter of the Valley Forge Signal Seekers, another idea. Jeff Troy, who writes the "Morning Lift" column credits Carl Foltz of the Lancaster Area Soaring Society with a good idea for closing those spoilers. Fig. 3 is self-explanatory, I think.

★

Another idea comes from Leonard Keer of Gilcrest, Colorado. Leonard thought the Olympic II could use a bit of a face lift. He says, "I used the stock fuselage sides, but cut the hatch area down a bit for the canopy. The wing was lowered one inch, using the wing plug-in and spoiler hook-up as in the Sagitta. A top block was added where the wing should have been, which locks the canopy in place. Of course it flies just like an Oly."

★

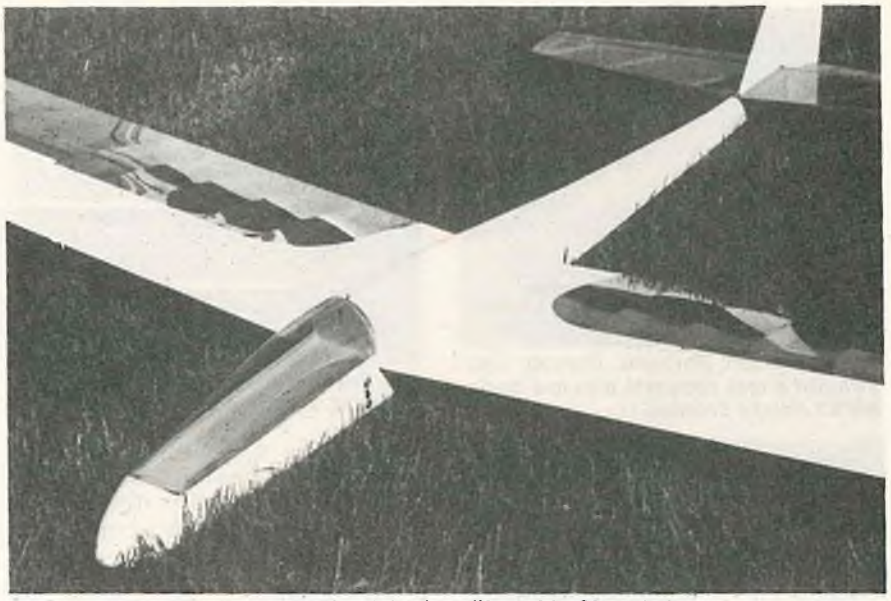
I've had several inquiries as to where one can have foam wing cores custom cut. I suggest you write to Eastern Soaring Supplies, P.O. Box 437, Lemont, Pennsylvania 16851. They not only have a number of airfoil sections available, but will custom cut from your sections.

★

Had a nice letter from Lee Lippert of the Twin Cities Radio Controllers. Lee sent an account of their Third Annual Summer Soaring Weekend with some good pictures. Seems as though whilst Saturday was a good day, they were blown away on Sunday. I've read of more contests which were preceded by a week of perfect weather which were either rained, or blown out. Oh well, there's always next year.

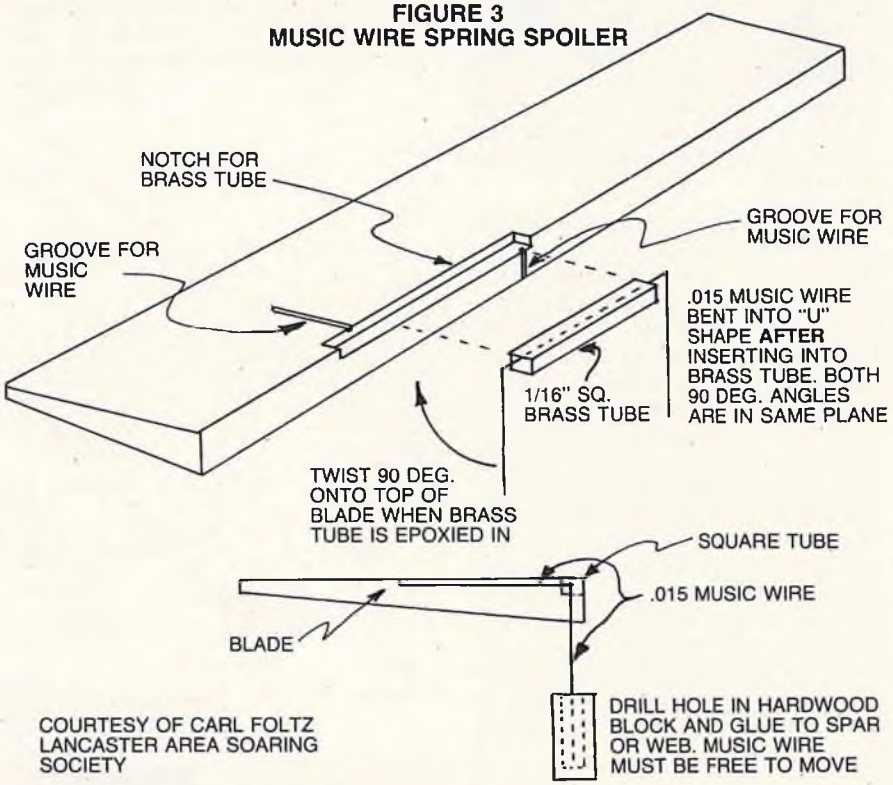
★

I was priviledged to attend the 1982 Northwest Soaring Society Tournament in Richland Washington. I've never been in Eastern Washington State before. It is indeed different from the Western Coastal section. It is quite arid and looks much like California. I'm not going to report on the contest other than to say that it was won by Erik Eiche from Vancouver, British Columbia. All the

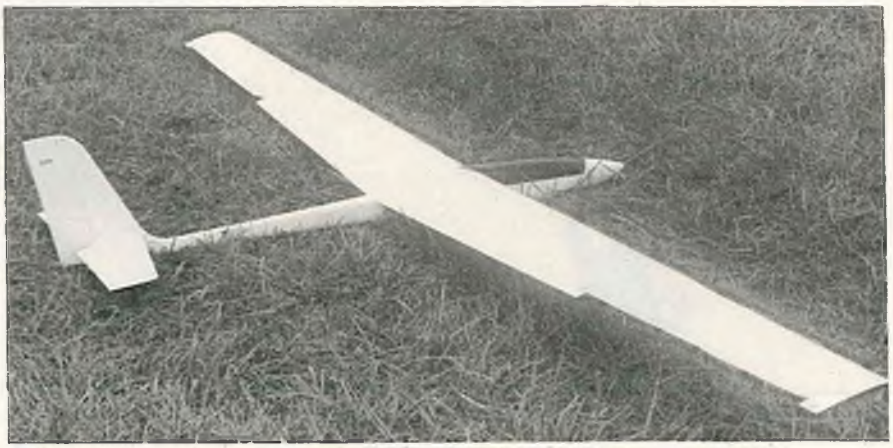


Leonard Keer, Gilcrest, Colorado, did a face lift on his Olympic II.

FIGURE 3
MUSIC WIRE SPRING SPOILER



COURTESY OF CARL FOLTZ
LANCASTER AREA SOARING
SOCIETY



Dodgson Designs' new "Windsong." 134" Eppler 214 aileron air brakes.

Dave Johnson, Portland, Oregon, was awarded a rock complete with tow hook. NWSS Annual Champs.

The Pacific Northwest is big on aileron sailplanes. NWSS Annual Championship, Richland, Washington.

Erik Eiche, Vancouver, B.C. winner NWSS Champs receives award from CD Roy Anderson — Erik beat everyone with his Gentle Lady.

Northwest big guns were on hand with the largest collection of sleek aileron ships I've ever seen (I counted 21 with ailerons). What do you think Erik won with? A Gentle Lady! This Gentle Lady was unusual in that it was equipped with "Directional Counter Acting Anti Negative Lift Reversers." This somewhat obscure name was coined by Erik to describe a turning assist device used while landing. I took a neat picture of this mechanism but opened the camera before the roll was completely rewound, thereby losing the first five pictures, including the one of the Gentle Lady. I am gradually, one by one, making all possible photographic mistakes. Anyway — I've made a drawing, as nearly as I can remember, of the lash-up (Fig. 4). The way this thing works is that when the spoilers are up, they are connected to the rudder. When the rudder is turned, the opposite spoiler is lowered by an amount proportional to the amount of rudder. This increases the lift and lowers the drag on that wing, enhancing the roll in the direction of the rudder. It sure worked, as Erik snuggled right up to the spot on every

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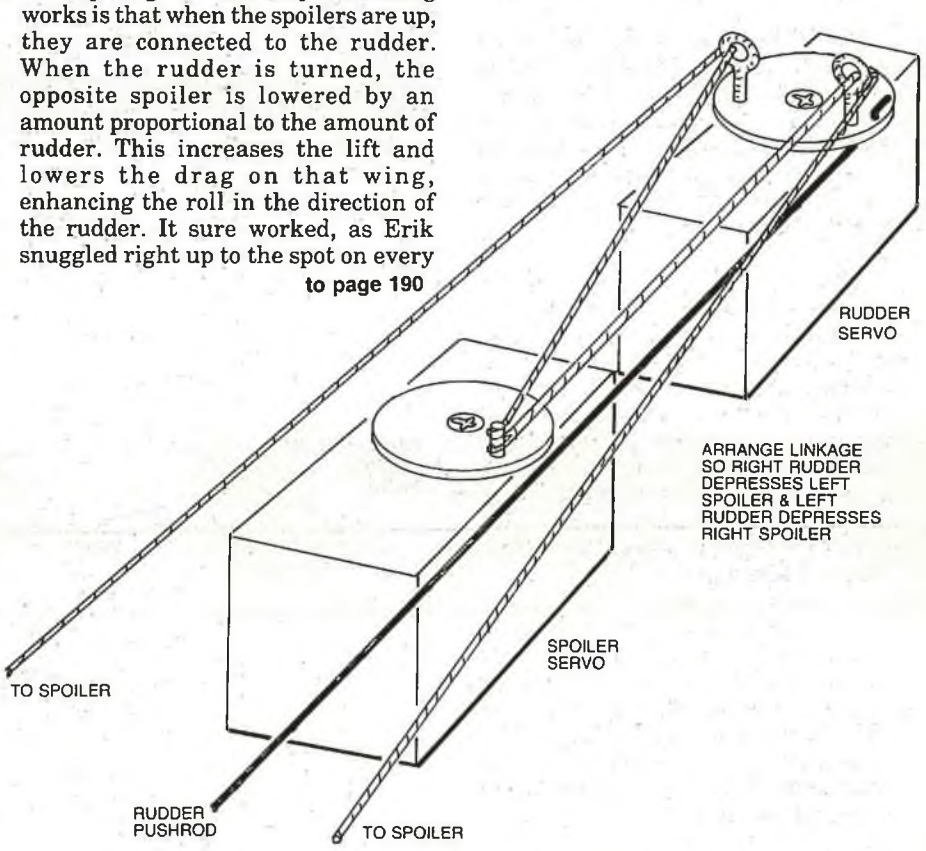

FIGURE 4
ERIK EICHE'S DIRECTIONAL COUNTER-ACTING ANTI NEGATIVE LIFT REVERSERS

Steve Bowman, Minnesota Summer Soaring Weekend Grand Champion, launches his Sagitta.

Bob Sealy, Minnesota Summer Soaring Weekend Scale winner with his immaculate Libelle.

ENGINE CLINIC

Clarence Lee

While attending a local model boat meet this past weekend at Legg Lake here in Southern California, I had a long talk with John Brodbeck, Sr., who heads the K & B operation. It has been rumored for some time now that K & B would be producing a production run of Cox "Conquest" .15 engines. This was confirmed by John Brodbeck and the engines are scheduled for release about the same time this column appears. If not, then shortly after. This will be good news for the Quarter Midget Pylon fliers and others looking for an American made .15 displacement size engine that will be competitive with the Rossi .15 and other foreign imports. In years past, when produced by Cox, the Conquest .15 could give the Rossi .15 some serious competition and the new production run produced by K & B should be even better. Some of the shortcomings of the older engine have been corrected which include a new piston material, stronger rod, and modification to the port timing. The result should be a really potent .15 size engine.

Those of you with the older Cox-produced Conquest .15 will be glad to know that the parts for the new engine can be used in the old one and can be ordered through K & B's Customer Service Department which is headed by Bobby Tom. The new engine will have a slightly longer rod which means the sleeve will, in turn, have to be raised in the old engine, but K & B will have shims available for doing this. If the sleeve is not raised, the port timing would be critically affected.

Many of you are probably wondering why K & B would now be producing the Cox .15. Both K & B Manufacturing and Cox Hobbies are divisions of Leisure Dynamics. Although the 1/2A size engines will still be produced at the Cox plant it was felt that production of the Conquest .15 could be handled more effectively at the K & B plant.

Model boaters will also be happy to hear that K & B's new .67 marine engine should be in production by the time you read this column. Although prototype engines have been running for several years, K & B did not want to start production until they were sure they could produce an engine equal to or better than the Rossi, OPS,

K & B/Cox Conquest .15. Available in R/C Sport, Free Flight, U-Control and 1/4 Midget versions.

etc. Although the basic engine design was resolved some time ago a decision on the exact bore/stroke ratio has held up the start of production. For those of you who do not believe that bore/stroke ratio play a large part in the power output of an engine, you should have been around during testing of K & B's prototype .67's. The shorter stroke/larger bore engines worked best in the hydroplane type models due to the prop running high in the water, but did not work as well in the deep vee and monoplane type boats where the propeller runs deeper in the water. The longer stroke/smaller bore engines, on the other hand, worked best in the deep vee and monoplane boats but not as well in the hydros. So a lot of testing and experimentation has been going on this past year before finalizing on the bore/stroke ratio that will be used in the production engine. Six more prototypes were finished this past month and, if all goes as expected, will be the production version. The long stroke engine when propped accordingly now seems to work very well in all types of boat hulls. In fact, times in excess of 90 mph have been clocked several times which exceeds the world record.

K & B will also be introducing an aircraft version .61 but this will not be until after the release of the marine .67. By the time K & B releases their new Schnuerle port .67 marine and .61 aircraft engines they will have been one of the most tested designs of any model engine, having been under development for almost eight years now.

★

Dear Mr. Lee:

A careful check of Volumes I and II of the R/C Engine publications fails to provide an answer and, hence, this letter.

It is noted, generally, that model engines are normally mounted with the shaft in a horizontal plane, thus providing adequate lubrication to the shaft bearings. However, recently, we suddenly became aware of the fact that with many of the engines installed in model helicopters, the shaft is in a vertical plane and, hence, the question: how does the front bearing receive its lubrication?

In many of the chopper engine installations, the cooling fan is usually mounted on the shaft right next to the front bearing and, with the cooling shroud installed, it is almost impossible to oil the front bearing from this position. However, hundreds of hours of engine operations without lubricating the front bearing have been experienced with no adverse effects to date. In fact, conversations with other chopper pilots indicates no bearing problems from this vertical installation.

As a matter of curiosity, an explanation of this peculiar phenomenon is kindly requested, together with recommendations for

proper maintenance should you deem this necessary.

Thank you for you kind consideration and assistance regarding the above matter. Your publications, Volume I and II, as well as your monthly column are read with interest and provide an unending education in model engines.

Yours truly,
William T. Kawai
Japan

You do not have to worry about the front bearing receiving lubrication when mounted on its back for helicopter operation as it is crankcase pressure that forces fuel to and, in many cases, out the front bearing. Although an engine mounted on its back will run a little dryer than one mounting in the horizontal plane, lubrication is still not a problem as you have found out. If someone should ever have trouble with the front bearing running dry on a helicopter engine, loosening the fit of the crankshaft in the housing at the seal area just behind the bearing will increase lubrication. This can be done with a dowel and #400 grit wet or dry emory paper. Be careful, however, as it only takes a few ten thousandth to go from too dry to slobbering wet.

Sir;

Enclosed you will find a SASE in hopes that you will please answer my questions concerning the O.S. Max FS .60 R/C 4-cycle engine. I am in the process of building my first scale aircraft, a Jemco P-47 Thunderbolt. I would like to power it with a .60, and I heard how great the "four cycles" sound. I heard that the four cycle .60's do not have near the power as the regular .60's. I would like to know if this is so. Also, normally, how much trouble are they as compared to a regular .60. I am now flying a O.S. Max .40 which just runs and runs with no trouble at all. Because of this I was considering a O.S. Max .60. Some fellow modelers seem to spend more time tinkering with needle valves than flying. I don't want to carry a feeler gauge in my pocket all the time — if you get my point. I do not consider myself an "engine person"; in other words, I have never had an engine apart. I would appreciate your advice on this subject.

Thank you for your cooperation in this matter. I would appreciate this information very much.

Sincerely yours,
James J. Preston
Willow Grove, Pennsylvania

I do not believe the O.S. four stroke would be a very good choice of engines to power a P-47. The P-47 has to move fast to fly properly and usually takes quite a bit of power to do so. This requires a higher rpm engine. The four stroke engines for their displacement develop about 2/3 the power of a two stroke of the same displacement. In other words, the O.S. .60 four stroke develops the power of an equivelant .45 two stroke. Four stroke engines do have better low end lugging power and are at their best turning large props at lower rpm. Whereas a two stroke engine lugging a large prop would have a tendency to overheat, the four stroke will run considerably cooler. The four stroke engines are at their best in slow flying models where a larger prop turning at a lower rpm can be utilized. Your P-47 will require a fairly large diameter prop due to the size of the cowl but it will have to, in turn, be on a two stroke engine that will let it turn up.

As far as sound — the four strokes do have a distinctive sound but it would not be the type of sound associated with a P-47. More like an old "Jenny." The valves on four strokes do not require too much maintenance. They usually have to be adjusted after the first hour or so of running and from then on they hold their setting. Of course fellows who fly from dirt fields, etc., are going to have to adjust the valves more often due to wear.

Dear Mr. Lee,

I had a lot of trouble getting a new Enya .09 started so, being a novice, I brought it to the field where a couple of club members got it started with a Sullivan Hi-Tork starter. I bought the same starter and proceeded to break the engine in on the bench. I got it going a few times but on one attempt, it encountered resistance and swung the engine around, off-center. It seized up and I removed the shaft to find that it had bent slightly. A friend turned it down on a lathe and I reinstalled it and got it going. I see others using these starters on small engines although I have been advised, by one who I consider to be an expert, not to do so.

I have been warned about hydraulic lock and a few other hazards associated with using a high torque starter for a small engine. I also know that an engine expert never needs a starter, but for people like me, what further advice can you give on the use of electric starters on .049 and .09 engines? They seem to be quite hard to start by hand. Are there perhaps prop spinners or other gadgets or techniques which can help avoid damage to engines?

What do you think of the idea of running an electric starter on a new engine with the glow plug removed to start breaking it in?

Sincerely,
James W. Cooley
Yorktown Hts., New York

The Sullivan Hi Tork starter is a pretty large starter for an .09 size engine. It can be used but you have to be very careful about applying too much muscle which you must have done. A better choice would have been one of the Astro Flite, or similar, starters intended for the small bore engines. Also, electric starters are intended to be used with a spinner or spinner nut. You should never try to use one just by pushing it against the prop nut or prop. It is very difficult to center and you usually end up

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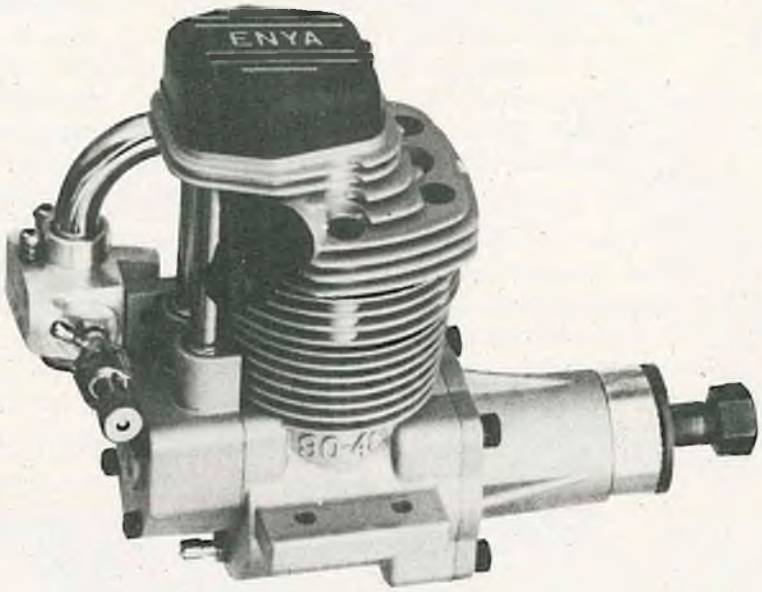
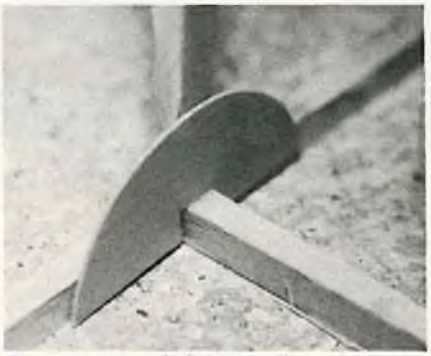


The new Enya .90 four cycle was seen at the Circus Circus Tournament of Champions.

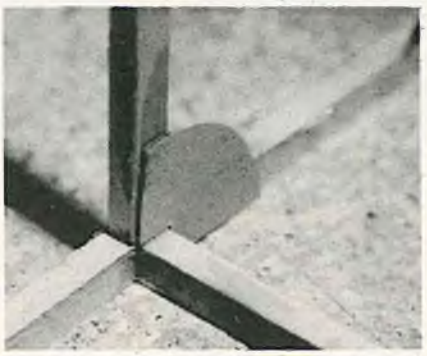
BIG IS BEAUTIFUL

Dick Phillips

Bare bones fuselage framing butt joint. Glued area is minimal and joint is quite weak.



Square slotted 1/32" plywood gusset assures a good joint between fuselage longeron and vertical member but neglects any strengthening of fuselage cross member.



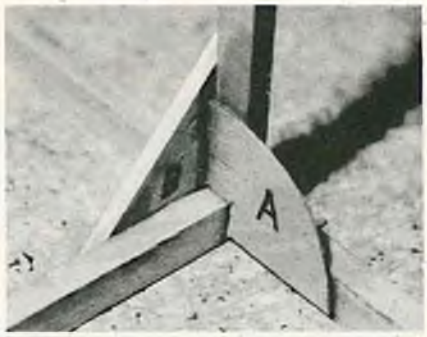
Quarter circle of 1/32" ply still makes good bond between longeron and vertical member adding significantly to the glued area and the rigidity of the joint.

This month, let's talk about joints. (No, no, Algernon, not the type of joints you go to Saturday night and wake up ill Sunday morning!) The types of joints we make when building our large models and how to make them very strong indeed.

In conventional stick construction, especially in a fuselage, we will make a number of joints where a fuselage upright butts onto the fuselage longeron. The surface area of this joint is .0625 square inches in quarter square stock and .0961 in 5/16 square. That's not a lot of glued area considering the strain we may put on the fuselage in flight (or in landing!). We could increase the area and the weight of the finished model by going to larger dimension material, but if the material we are using is strong enough for the job, then the answer would be to increase the strength at the joint without increasing the weight appreciably.

We can do this in a number of different ways, drilling a small hole through to longeron into the cross piece or upright and inserting a glue soaked round toothpick will increase the strength of the joint, but has the danger inherent of weakening the longeron itself (more on this technique later).

Addition of triangular Lite-Ply gusset ties vertical and cross member together and strengthens the cross section preventing it moving out of square. Fit should be as close as possible for good gluing and for greater strength.



Finished joint is now solidly connected in all directions and very much stronger than original butt joint and less likely to deform or come apart. Part A is 1/32" plywood and part B is 1/8" lite ply.

I have mentioned gussets in previous columns but the procedure has been refined a bit to combine the best of a couple of different methods. Gussets may even be added to an existing structure after completion by notching the gusset to clear the cross piece of the vertical member and they will increase the strength

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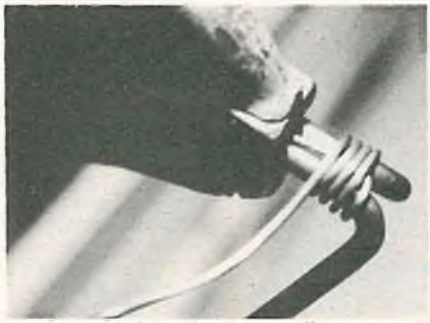
Three part wing tip corner is tied together after gluing by drilling into joint with a slightly undersized drill and driving glue coated cocktail toothpicks through joint. Penetration is indicated by half toothpick lying on top of material.

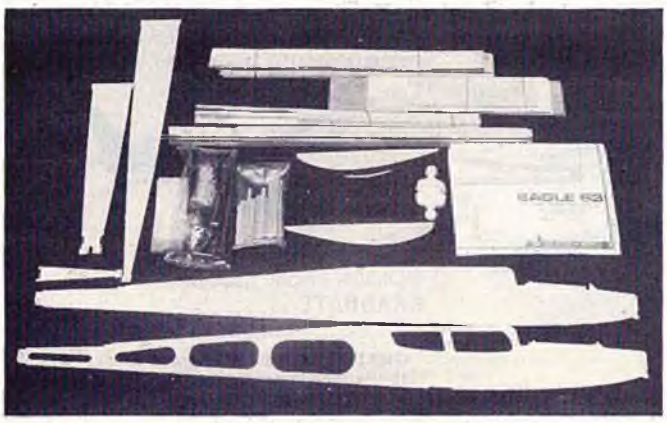


Vice grips hold wires in place while being wrapped with steel wire (not piano wire). Note that end of wire is wrapped under turns of wire holding parts together.

Joint after soldering with solder with melting temperature of 275-300°C. Joint is much stronger than copper wire and ordinary solder joint and heat required will not affect temper of the wire.

RCM PRODUCT REVIEW

Carl Goldberg Models EAGLE 63



SPECIFICATIONS

Name	EAGLE 63
Aircraft Type	R/C Sports Trainer
Manufactured By	Carl Goldberg Models 4734 W. Chicago Ave. Chicago, Illinois 60651
Mfg. Suggested Retail Price	$59.95
Available From	Both Mfg. & Retail
Wingspan	63 Inches
Wing Chord	11¾ Inches
Total Wing Area	715 Sq. In.
Fuselage Length	49 Inches
Stabilizer Span:	24 Inches
Total Stab Area:	168 Sq. In.
Recommended Engine Range	.29-.49
Recommend Fuel Tank Size	8 Ounce
Recommended No. of Channels	3 or 4
Rec. Control Functions	Rudder, Elev., Throt., Ail.
Basic Materials Used In Construction:	
Fuselage	Ply
Wing	Balsa, Ply & Spruce
Tail Surfaces	Balsa
Building Instructions	Yes
Instruction Manual	Yes (32 Pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Kraft Gold Spectrum Six
Engine Make & Displacement	K & B .40
Tank Size Used	Sullivan 8 oz. Slant
Weight, Ready to Fly:	76 oz.
Wing Loading:	15.3 oz./sq. ft.

SUMMARY

WE LIKED THE:
Design of the ply fuselage, parts fit, and plans layout.
WE DIDN'T LIKE THE:
Nothing applicable.

Having built and flown the smaller Goldberg Eaglet 50, we looked forward with great anticipation to the arrival of the Eagle 63 kit. The Eagle 63 is a .40 size sport plane which is based on the Eaglet; it is an easy kit to build and goes together surprisingly fast.

The first thing we did upon arrival of the kit (and we recommend you do the same) was to remove the plans, lay them out flat so everything may be seen, then read and study the 32 page book of instructions. We read, checked it out on the plans, and made sure we completely understood each step. Sometimes it is difficult to follow the reasoning for the chronology of the step but believe you me, there is always a good reason.

Before you go any further, take the instructions and drop by the hobby shop and pick up the items you need for the kit. On the cover of the instruction book is a list of additional items needed, a list of optional parts, and necessary tools and supplies. Most of the latter you probably already have around the shop.

Next, turn to page 4 and open the kit. Examine each piece and locate the picture of it in the instructions. Identify each piece, its function, and quantity. Every part has a die stamped number or letter, darken these letters or numbers with a soft pencil or fine felt tip pen; this makes it easier to find later. All strip woods are pictured at the bottom of page 4 for identification.

While you are at it, check out the other features of the kit. All balsa and ply die-cut sheets are rubberbanded together to keep fall-out to a minimum. The spars and balsa strips are also rubberbanded to minimize warping. The hardware and plastic parts are bagged in plastic. The hardware in this kit is extensive, everything right down to the smallest sheet metal screw is present. Plastic horns, front landing gear block, aileron fittings, hinges, and other plastic parts are here in quantity. We had to buy wheels, fuel tank, and covering material — that is about it.

The die-cutting is outstanding and only once did we find it necessary to use an X-Acto knife to remove a wing rib from its sheet. All the other parts, both ply and balsa, separated cleanly and easily. Be sure to save the ply scraps surrounding the fuselage sides, they will come in handy later.

Construction:

The large 42" x 50" shaded plans are exceptionally complete. All the open spaces are filled with boxed hints, instructions, and cautions. Three different engine installations and two types of servo layouts are detailed.

One feature we especially liked is having the wing drawn upside-down so we may build it with the excess plans rolled at the back of the workbench. The stab, fin and rudder, are similarly drawn at the side of the plans. With this arrangement, you never have to work over one drawing to get to another. They are an excellent set of plans.

Also included is a most complete 32 page instruction book. There is either a picture or isometric drawing for every step. There is a place with each step so you may check it off when you have finished the task.

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CUNNINGHAM ON R/C

Chuck Cunningham

Norman Stirling's self designed Star Fire 40 size aircraft with retracts and WW II paint job.

Star Fire waiting for dawn patrol.

Norm's Star Fire with Max .40, flies like a dream. Sister ship called Sky Fire.

I like to design, build and fly larger R/C models. Most readers of this column have figured that out over the years. I'm not in favor of the really large R/C models — the hundred pounders — but I really do enjoy just about any aircraft that has a wingspan of at least six feet or more. They suit me better. With the advent of chain saw engines, R/C flying has moved into a direction that I really think is super --- models that generally look like a full size aircraft, and that fly at a reasonable speed. But, why haven't the radio manufacturers kept up with this movement? It's not exactly new; heck, in 1983 I will be hosting the Sixth Annual Southwestern Jumbo Fly-In. Sure, larger servos are on the market, and have been for several years. Sure, larger battery packs are on the market, and have been for several years. But, have you tried to purchase a complete radio system designed for the larger aircraft, e.g., those carrying .90 and larger engines? Don't try it, it isn't possible. Check any ad or catalog that you want. If you purchase a transmitter, receiver, five servos and a heavy duty battery pack separately, it costs you an arm and a leg. The only way to go is to purchase a standard radio set, then add in the extra servos and larger battery. You have a whopping investment in radio equipment. It is always much less expensive to purchase a complete set, but you simply can't do it.

One of the biggest problems in flying larger aircraft is battery packs. By now you know that you need a pack that is much larger than the standard 500 mA battery pack that is supplied with normal radio equipment. A 1200 mA pack is better; an 1800 mA pack is better still. Okay, no problem — order a larger pack from any of several sources, equip it with a plug that is compatible with your equipment and you're in business. Like heck you are. How are you going to charge that battery pack? Stick it on your regular equipment charger? These charge at a rate of 50 mA, or ten percent of the rated size of the normal battery pack. You need to charge a 1200 mA pack at 120 mA for a minimum of ten hours to bring it up to full charge; an 1800 mA pack at 180 mA for ten hours. If you're charging your 1200 mA pack on the standard charger, then in ten hours you have stacked up a winning 500 mA, or just a bit over a third of the battery's capacity. You never can get it charged. You need a separate charger to punch up the larger packs.

How many fliers have gone to a two day fly-in, even with larger battery packs, flown up a storm on Saturday, charged overnight at the motel, then gone out on Sunday and dorked the pride and joy, never knowing why? If it's a fly-in with very limited flying, this doesn't happen, but one where there is lots of flying will sure show up this problem. The battery in your radio system is one of the best friends that you will ever have, but at the same time it has the potential for being your worst enemy.

This is why I'm jumping up and down to have a system designed for larger birds. The current transmitters and receivers are super, so are the larger servos, and larger packs, but put them all together so that you have a **system.** Provide five large servos with a Y connector for the ailerons; provide at least a 1200 mA battery pack (I'd rather have an 1800 mA pack); and provide a dual charger that will charge the transmitter at its regular rate and the receiver pack the way that it should be charged. Flying the normal large model, weighing from 15 to 25 lbs. can be done very nicely on this type system without any problems. How about someone in radio land listening?

Speaking of larger models, another revolution that is moving into the R/C scene is the growing use of four stroke engines. I don't have one yet, but several of my friends are flying them. I feel reasonably certain that they are flying them because they make almost no noise in the air. The sound of a four

stroke both at idle and full bore is simply pleasing to the ear. We have become so accustomed to the blast of the standard glo engine over the years, that when a quiet, humming engine comes along it takes a couple of minutes to really realize just how pretty it does sound. The four strokers don't put out the rpm that a standard glow engine does, and this is causing a slight problem. Again, I have to pass along what I see and hear from others because I don't have one yet. Some modelers put the same size four stroke engine in the size aircraft designed for that displacement engine. They use the same type of prop that was used on the normal glo engine. The combination doesn't work. The four stroker works away like mad, rocker arms and valves moving up and down, soft sounds coming out of the exhaust, and the prop turning at 6500 rpm to 7000 rpm and the aircraft is just barely flying. I had this experience last weekend. A friend of mine built a 60 Turbulent, equipped it with a .60 four stroke swinging a 13/5 Zinger prop, and I made the test flights. It was pretty close to disaster. The aircraft simply was not moving fast enough to fly well. It looked nice and sure sounded nice in the air, but it wasn't flying well.

I was talking on the phone to my good friend Gene Wallock (He is the balsa cutting genius responsible for making the kits of my designs). Gene used a .60 four stroke in his 7' x 10 lb. Pietenpol Air Camper (RCM plan #869). Gene says those engines are designed to turn at 6500 to 7000 rpm and to move a large prop with lots of blade area. He said that he found that the best prop on his 60 was a 16/6 Y & O prop. This prop has lots of blade area. That four stroke engine can handle a larger prop with more blade area. The Zinger line of props is super on engines that are turning at a high rate of speed, but they are thin bladed, designed to be turned fast, thus generating their desired thrust. If you have been having problems getting the needed amount of power from your four stroke engine, try a wide blade Y & O prop. As a rule of thumb on prop size, go to about twenty five percent larger diameter than you would use on a standard glo engine, don't go less than a 6 pitch, and try a wide bladed prop. Perhaps, then, you will have beautiful sound as well as beautiful flying. Don't expect to go like a bat out of heck, four strokers just aren't designed for the high speeds of the two cycle engines.

★

You know, one of my biggest drawbacks to the total enjoyment of R/C building and flying is that I have to work for a living. All of us are pretty much in the same fix when it comes to having to work --- sure does cut into the R/C time, doesn't it? I have an extra problem though. A lot of readers think that I, and several other of the long time columnists, live and work at the RCM office in sunny Southern California. Many believe that my only occupation is at RCM and that I'm sitting behind a desk, dreaming up new ideas and waiting for letters to come in with tons of questions to answer. I wish that I had the time to answer everyone who writes in. I enjoy reading about your activities, and I enjoy getting pictures that can be added to this column. If you have a question that can be answered quickly and simply on the back of the piece of paper that you used for your letter, and if you enclosed a self addressed stamped envelope (SASE) then I'll do my best to answer. But, I don't work at the RCM office. I live in Fort Worth, Texas, am the Vice President of a steel fabricating company, also am in business with one of my daughters, own and operate Sky Master Industries, write this column each month, design and build R/C models, draw plans for what suites me, try to keep the grass mowed, act as a father to my three children and a husband to my wife, play with my dogs, clean out my workshop once in a while, and then try to answer letters. If a short answer will do the job, okay, but if you want a long detailed answer on a whole bunch of things, then, quite simply, I don't have the time to do it. Sorry, but those are the facts of life.

★

Yesterday I was working with some two by fours, cutting them into 3" long pieces. In working with these pieces of wood, gleaned from some dusty corner of my garage, I realized that the grain pattern in this particular piece of wood wasn't worth a hoot. It was just a standard fir 2 x 4 that would work well as an 8' wall stud, but when cut into small pieces, didn't work well with nails. I predrilled holes so the nails were less apt to split the wood, but the grain was still a problem. The problem confronts us in model building but we often overlook it. Balsa wood is such a wonderful substance that we really don't worry too much about wood grain, until something fails. Balsa density ranges from about two pounds per cubic foot up to twelve pounds per cubic foot, which is one heck of a range. Most of our material runs in the 4 to 6 lb. range. Most balsa has straight long grain, but every now and then you may find a piece of wood with the grain running other than parallel to the length of the piece. If you're scratch-building models, then you need to learn how to pick out material from the balsa racks. If you're a kit builder, then you need to learn how to inspect the wood that comes in the kit to be sure that the wood used for a structural component will be strong enough to do the job that it was designed for. Most builders of larger models are building from scratch and using pine and other woods for the main structural members. Just because the piece of wood that you choose is stronger than balsa doesn't mean that at some point the grain will not decide to wander from the straight and narrow and suddenly you find that the piece really is cross grained. The grain of the blocks cut from the 2 x 4 was so heavy and pronounced that a nail driven through it caused the block to fracture along the grain line. Check your balsa wood and check the sheet wood that the ribs are made from. Nothing is worse than to have

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Lake flying sometimes makes for tree lined approaches. Good airplanes are a must.

Chuck's Powerhouse making take-off run. January column devoted to seaplanes.

A new standard for the Clamp-on Class!

The Hotshot 45 by Dumas

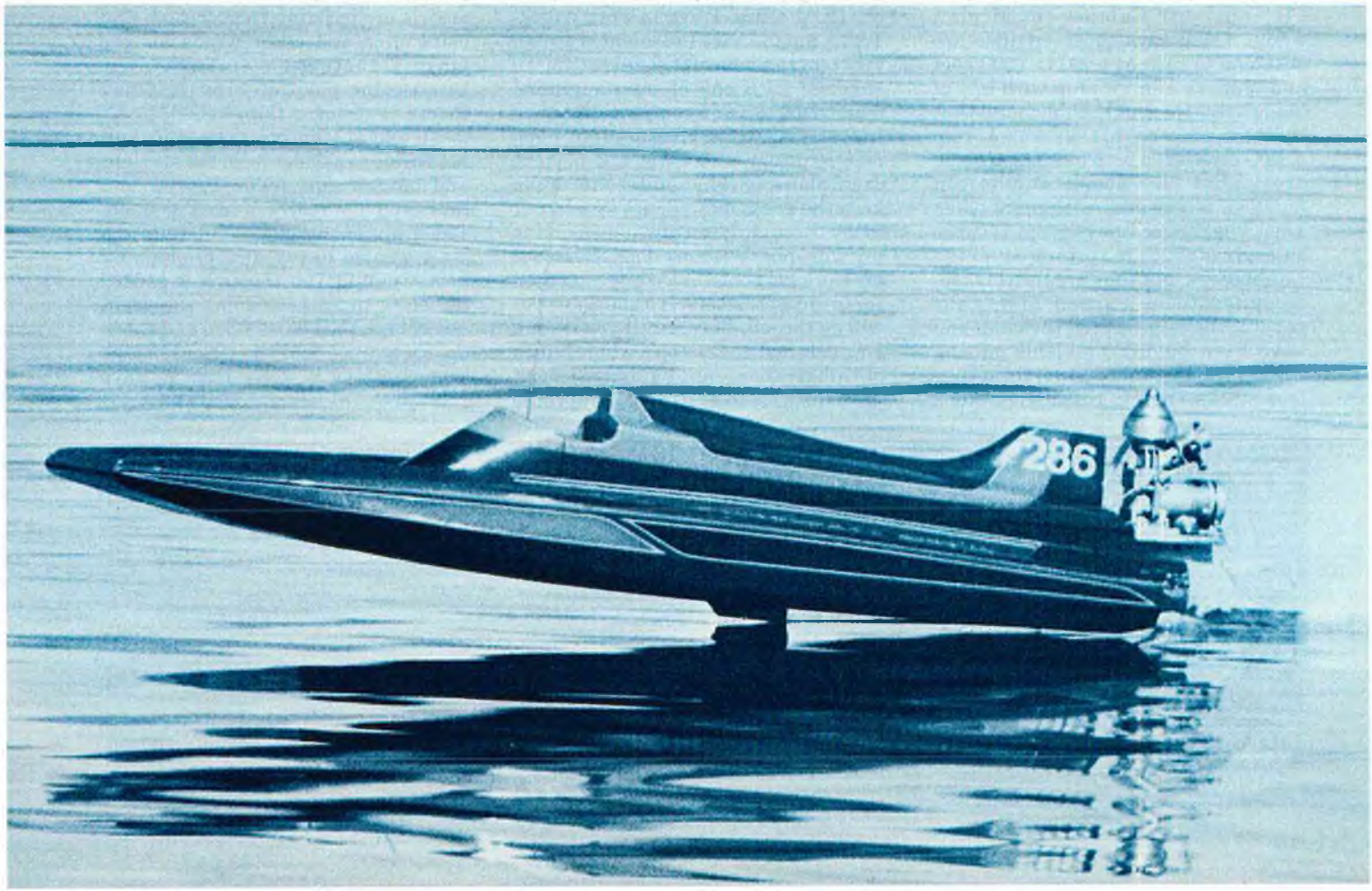
Designed by Jerry Dunlap... debugged on the racing circuit. The new Dumas Hotshot 45 has proved itself a top performer for the new 7.5 outboard class even before Dumas kitted it! Built of cleanly diecut plywood, the rugged and beautiful Hotshot 45 is at home on the racecourse or just running around on your local pond. Length 35½", Beam 15". Ask your hobby dealer for kit No. 1318, the great new Hotshot 45 outboard tunnel hull!

Dumas also offers the Hotshot 45 in Fiberglass, Kit No. 1319, the Hotshot, a wood tunnel hull, Kit No. 1311 and the Hotshot 21, Kit No. 1313, a fiberglass tunnel hull for fun or racing in the 3.5 outboard class.

See your local hobby dealer, or send $1.00 for a complete Dumas Catalog. Dumas Products Inc., 909-G E. 17th Street, Tucson, Arizona 85719.

dumas® boats

The Model Boat People®

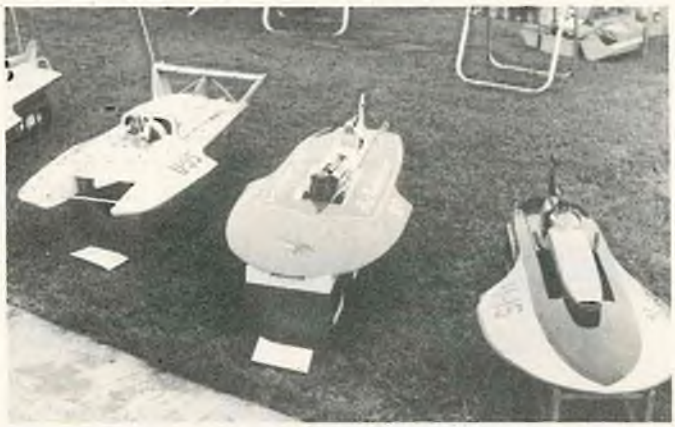


POWER BOATING

Howard Power

Unlimited model hydro concours line-up.

The old and new designs were represented in San Diego.



The U-95 Turbine boat sits next to Miss Bud and my Gypsy.

Eddie Patten's Miss Cott Beverages flat out.

Terry Holland's U-71 Atlas Van Lines running strong.

On the weekend of September 17th this year, the Circus-Circus Thunderboat Regatta was held on Mission Bay in San Diego, California. This is an annual gathering of the "big boys" in unlimited hydroplane racing. In conjunction with this full size race, the San Diego Argonauts Model Boat Club and the Southern California Scale Thunderboat Association presented the Bill Muncey Classic model boat race. Commodore Woody Woodhouse, Avis Nystrom, Ira Cotton, Pal Jennings, and others too numerous to name, made this year's race one of the most successful Scale hydro races we have had the pleasure of attending. Approximately fifty 1/8 Scale models of past and present unlimited hydros arrived on Saturday to race on the confines of the San Diego model yacht pond.

For those of you who are a bit unfamiliar with these models, let me quickly describe their specifications. Most boats are over 40" in length with a beam of approximately 18". These scale models are usually constructed from scratch with a wooden framework or are molded from fiberglass and weigh approximately 15 to 20 pounds. Most of these boats are capable of 50 to 55 mph chute speeds when powered by a hot 11cc marine racing engine. All boats are to a scale of 1½" to the foot of full scale boat dimensions within a ± 10% deviation. The boats must have a dummy engine or cowling, be painted to a scale paint scheme and be complete with cockpit, windshield and driver.

The first three photos show a small portion of the pre-race lineup for the concours judging. The black and white photos don't do justice to the beauty and workmanship of virtually all the entries. The boats run as good as they look. Photo 4 shows a closeup shot of Eddie Patten's Miss Cott Beverages U-76 and Photo 5 shows Terry Holland's Atlas Van Lines U-71 rounding the right turn buoys (beach balls) before accelerating down the front straight. The boats really duplicate the running characteristics of the real boats including the prop roostertail and turn fin spray patterns. This is evident when you look at Photo 6 which shows Jack Bishop's Miss Bud U-12 leading Frank Canning's Miss Bardal around the right hand turn. After three rounds of qualifying on the salt water San Diego pond, the main event started with all five boats hitting the start together. Dick Barlag's Detroit Radiographics took the lead with Darryl Smith's

Jack Bishop's U-12 Miss Bud leading the way.

U-13 Gilmore Special getting a new Rolls Royce Merlin.

Valvoline second. Valvoline made several attempts but just couldn't get past the inside line taken by Radiographics. Leonard Feeback's "Oh Boy Oberto" and Terry Holland's "Atlas Van Lines" were the first two race victims which left Cathy Galbraith's "Candyman" in third place until she blew off the water in a series of spectacular flips and recovered! By the third lap Radiographics lost her rudder and hit the beach giving Valvoline the first place trophy. After the final heat the racers cleaned up their boats and headed for the Bay where the big boats were qualifying all day.

Since the model boat race was held in conjunction with the full size regatta, the entry fee gave each participant credentials which allowed not only entry into the races but seemingly unlimited freedom to photograph and even touch the big boats in the pit area. Wow, what a modeler's dream! This was my first chance to see the big boats in action and I wasn't disappointed. Pit crews and even drivers bent over backward to politely answer all the dumb questions asked. It was quite an unforgettable show. Photo 7 shows a view of the pit area. An overhead crane is being used to change the Rolls Royce Merlin engine in the U-13 Gilmore Special (formerly the Circus-Circus display boat).

Most of the boats are powered by World War II fighter plane engines. The faster boats use Rolls Royce Griffon or Merlin engines but several of the older boats use the Allison. These 3000 horsepower engines push the 6000 pound hulls to speeds just under 200 mph. The engines operate at a max rpm of about 4000, are supercharged, and have nitrous oxide injection for stupendous acceleration out of the corners. Conversations with an engine builder revealed that each engine is rebuilt after its third run because of the stress experienced when operated on the nitrous oxide. And I thought model boat racing engines are short lived! The 13" diameter and about 23" pitch

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U-14 Miss O'Neil & Knudson on the crane before a run.

Aronow Unlimited U-19.

Aronow tunnel hull in its cradle.

Aronow U-19 rear view.

Aronow Unlimited running with U-2 Squire Shop in an early heat.

U-1 Miss Bud at rest before a heat.

propeller is turned approximately 12,000 rpm through a 3 to 1 step-up gear box. The boats are approximately 30' long with a beam of about 14'.

A couple of unusual boats were raced in San Diego. Unfortunately, the gas turbine powered Pay-N-Pak hydro did not appear. Miss O'Neil & Knudsen U-14 was powered by twin Ford overhead cam automotive engines. These engines put out 1600 horsepower and were fuel injected and turbocharged. Photo 8 shows the boat being lifted into the water before a heat. Sharp eyed readers can see a very large prop mounted very shallow in a slot cut into the stern of the very thin hull. This set-up made the boat very exciting when it was launched. Everyone on the dock received a big bath from the prop blast even before the boat was on the step. Also evident are the twin powerplants and a rudder assembly design that could have come off of many model hydros.

Also racing in San Diego was the first and only tunnel hull design for the unlimited circuit. The Aronow Unlimited U-19 shown on the crane in Photo 9 is powered by two Keith Black Chrysler automobile engines. Designer Gary Garbrecht and builder Bill Seebold first raced the boat in 1980 and evidently still don't have all the bugs out. Photos 10 and 11 show front and rear views of this unusual unlimited boat that is equipped with twin surface drive outdrive assemblies. The boat seemed to fly down the straights very well but apparently had great difficulty in the turns. A very peculiar situation for a tunnel hull design that usually shines in the corners.

Photo 13 shows the 1981 National Champion U-1 Miss Budweiser at rest at the dock. This photo clearly shows the size of these boats. Miss Bud had an uncharacteristic tendency to stop during racing and managed to finish only one heat during the weekend. This was the first race for the bud team after the untimely racing death of Dean Chenowith in Miss Bud. Rookie driver Jim Kropfeld must really be excited about getting the Miss Bud ride. The boat features a cockpit and engine offset to the left to aid in turning to the left. It is powered by a 2,239 cubic inch Rolls Royce Griffon engine which is the largest piston engine presently used in unlimited racing. The hull is also the largest and heaviest boat competing. These features make it one of the most stable running boats in the class. Photo 14 shows Miss Bud U-1 running in the mill with U-96 Miss KYYX. The mill is very interesting since there seem to be no rules! Boats can cut anywhere on the course as long as they don't hit something or each other. They even cut from the front straight to the back straight which in model boat racing is not permitted. U-96 Miss KYYX was driven by the first woman to qualify for unlimited racing in modern times. The boat is the old 1978 Squire Shop hull that Skip Hanauer drove to third in the National standings. Sponson modifications were made last winter and the boat seemed to be competitive with Brenda Jones driving.

The race was won by Atlas Van Lines U-00 driven by Skip Hanauer. This boat has many innovative design features which I'm sure will be incorporated into future unlimited hulls. It is powered by a Rolls Royce Merlin engine but may be converted to the bigger Griffon for 1983. This hull uses a sponson design and a deeply recessed bow that is very close to an outrigger. This reduces bow lift and subsequent blow-overs. Next month I will have more pictures of this boat and Miss Bud. We will, at that time, try to investigate some of the design features of these state of the art boats.

★

A couple of new items are being made available to boaters by Al Berry's RCB Products (Rt. 5, Box 45-A, Chickasha, Oklahoma 73018). The first item is a replacement starter cone rubber for the popular Sullivan Heavy Duty Starter. Its two-sided design gives you two ends to wear out and the rubber formulation is much better than that which comes with the original equipment. These cones have a stock number SCR-1 and cost $2.95 each. The second item is a new silicon-like fuel tubing that reduces its size when stretched. This opaque orange colored tubing can be shrunk to fit the ends of fuel and water fittings so that they do not vibrate loose. Tests that I have conducted show that the stuff really works but I have detected some swelling when high nitro fuel is used. The tubing comes in two sizes: medium (stock number FTM-1 and 95¢ per 3' package), and small (FTS and 95¢ per 3' package). If you don't mind not seeing your fuel run to your engine this tubing works well. The third item is a special space age tuned pipe coupler. This coupler is actually **guaranteed** to last **six months** or a replacement will be supplied upon receipt of your dated sales slip! I have

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U-96 Miss KYYX and U-1 Miss Bud in the mill.

Now, a moderately priced, .21 powered jet,

KIT FEATURES
- *10 oz. epoxy glass fuselage*
- *Precut balsa & plywood parts*
- *Decals & documentation for 4 different versions*
- *Full size drawings*
- *Photo-illustrated construction manual*
- *Scale detail parts including cockpit*
- *Landing gear struts & drop tanks*
- *New Metalkote covering for fiberglas fuselage (sample included)*

SPECIFICATIONS
- Wing span 42 in.
- Wing area 418 sq. in.
- Weight 4¼ to 5 lbs.
- Wing loading 23.4 to 27.5 oz./ft.²
- Fuselage length 43 in.
- Thrust to weight ratio .73
- Power req'd. — .21 eng. & fan unit

F-86 Sabre

$179.95
Kit No. K-19

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- *Photo illustrated instructions*
- *Precut balsa and Plywood parts*
- *Documentation*
- *Preformed landing gear*
- *3 piece wing for easy transportation in compact cars*

SPECIFICATIONS
- Wing Span — 84-1/2 in.
- Wing Area — 1,267 sq. in.
- Weight — 10 to 11 lbs.
- Wing Loading — 19 oz./sq. ft.
- Fuselage Length — 51-5/8 in.
- Power Required — .60 cycle or 4 cycle engine

NEW!

Photo of actual model

Pietenpol Aircamper
1/4 SCALE "PETE"

Kit No. K-22 $199.95

Featured in July 82 issue of R.C.M.

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Almost sort of genuine stand way off scale of

THE REAL THING

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KIT FEATURES
- *All balsa and plywood construction*
- *Full size plans*
- *Photo illustrated instructions*
- *Precut balsa and plywood parts*
- *4 to 6 hours assembly time*

SPECIFICATIONS
- Wing span — 44.5"
- Wing area — 324 sq. in.
- Weight — 40 oz.
- Wing loading — 17.7 oz./sq. ft.
- Power Req. — .09-.11

Kit No. K-23
$27.95

As featured in the Nov. 82 issue of R.C.M.

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SCALE VIEWS

Col. John deVries

Did you ever browse through a model railroad hobby shop? Or, visit a Radio Shack store? Or, consider building your wife a miniature doll house? Rather some weird questions with which to begin a column about **scale model airplanes,** I must admit. But that's what we're going to recommend you do this month. In fact, I'm going to suggest that you check the tools and materials available at several kinds of stores — all of them providing things for the handicraft type of person. You'll be pleasantly surprised at what you find that has direct application to R/C model building!

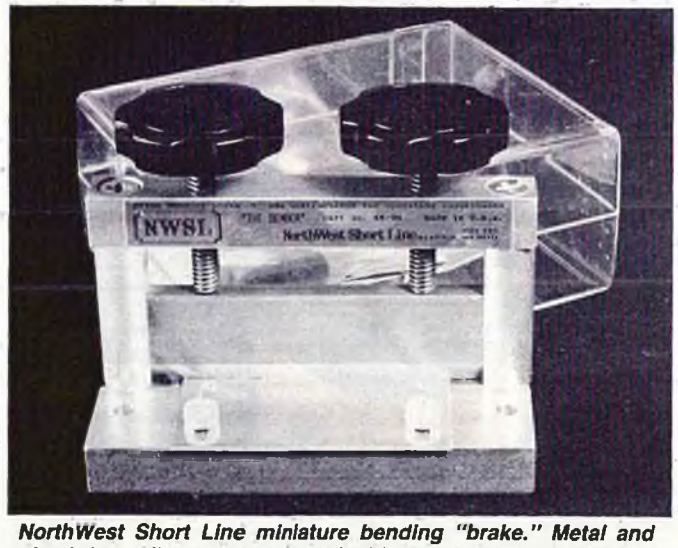
Probably the greatest collection of true "scale nuts" in the U.S. of A. are those enthusiasts who engage in the model railroad hobby. They combine the skills of the jeweler with the precision of the surgeon. Even the assembly of the simplest locomotive kit demands attention to scale that parallels directly, the finesse we require when we prepare an F4C R/C model for scale competition! And, I think you'll find that there are a host of specialized tools and materials that the railroaders use that we can adopt and adapt to our purposes.

For example: we frequently use sheet brass or aluminum lithographic plates to produce cowlings, canopy frameworks and landing gear covers. To form the thin metal, we may use a vise or pliers — or, try to bend things with our bare hands. But, the model railroader, who has to do precisely the same forming operations, may purchase a simple device called "The Bender." This tool is a miniature metal-forming "Brake," that accepts material up to 3" wide. It has two forming blades, one of steel, the other of plastic. The first will give you precisely controlled bends in the heavier metals; the other will permit bending the softer metals without marring their surface. For about twenty-five bucks, **we** can acquire the same tool — and produce a precisely bent windshield framework for our Waco Cabin ship that'll fit our R/C model exactly!

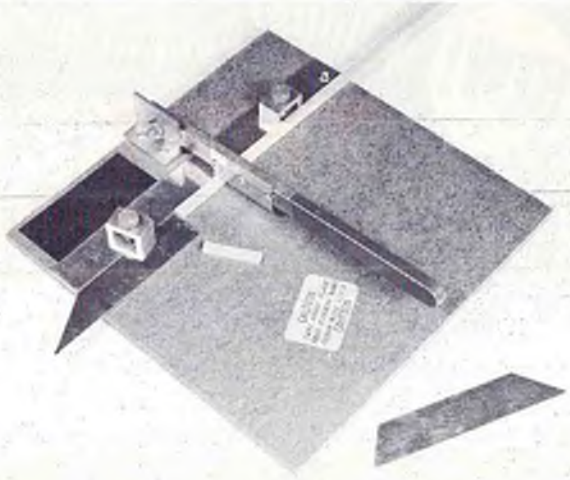
Or: when it comes to rivet detail on our scale models, most of us will fall back on the tried and true technique of "dotting" our ships with daubs of white glue from a hypodermic needle. That's okay on wooden surfaces, but on metal the first brush with a piece of sandpaper and the rivets are **gone!** Some of us may use our wife's tracing wheel on the reverse side of metal cowlings, to produce rivet-like projections. But, finding the proper sized tracing wheel is almost an impossible task. The rivet problem is also common to the model railroader, but **his** hobby shop carries a device called "The Riveter." This tool can produce **eleven** different rivet sizes in thin sheet metal — and space them precisely in **straight lines.** With a bit of adaptation and ingenuity, the same tool can be used to produce "engine turning," that distinctive set of swirls that are seen on the cowling of the Spirits of St. Louis and other aircraft of the Golden Age. The Riveter would be used in conjunction with a drill press for this application and a simple pencil eraser would produce the swirls.

One of our big problems, particularly now that we use the super-glues, is to get precisely fitting parts. For the thicker wood pieces, most of us use miniature miter boxes and stiff-backed razor saws. But, for the thinner woods, both balsa and plywood, we're inclined to attack things with the trusty #11 blade. We often end up with gaps where there should be a close, smooth fit between parts. Our browsing through the model railroad shop might uncover a device called "The Cutter." This tool, using standard stiff-backed razor blades, will produce square or mitered cuts in balsa strips that defy the super-glues! And, if your "thing" is the larger sized R/C models, "The Cutter" will turn out 1/64th plywood reinforcing gussets as fast as you can work the lever.

All the tools we've discussed so far are the products of a company in Seattle, Washington. NorthWest Short Line (Box 423, Seattle, Washington 98111) manufactures these and other excellent tools that have direct application to our scale

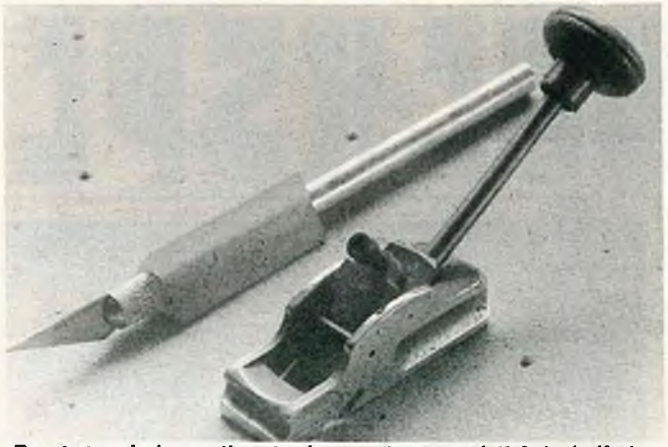


NorthWest Short Line miniature bending "brake." Metal and plastic jaws allow precise bends in thin metal and sheet plastic --- for "sanitary" R/C scale models!



The "Chopper," another NorthWest Short Line product intended for the model railroader --- but, with direct application to model airplanes. Device cuts strip wood precisely for dead-on accurate construction — good joints for the new fast glues!

Radio Shack's Mini Drill --- that's a 6" ruler in the photo. Finger notches steady the tiny drill for drilling servo mounting holes in hardwood, pilot holes for engine mounting blind nuts. Gears appear to be nylon.



Brookstone's brass thumb plane, with a No. 1 X-Acto knife to show scale. Tiny plane is perfect for rounding leading edges. Plastic pencil holder on X-Acto, found in a stationery store, is great to keep it from rolling off the workbench!

model building techniques. A stamped, self-addressed envelope will bring you their catalog if your local model railroad hobby shop doesn't carry their line.

Of course, a scale model airplaner may find himself, from time to time, in a Radio Shack. There are a lot of electronic bits and pieces they carry that we can use. But, the last time I dropped in to our local 'Shack (to get a new multi-tester) I was most pleasantly surprised. There, on the rack, were a bunch of Mini-Drills (Cat. No. 64-2097) — for less than three bucks apiece! Had to have one! The little jewel is made of nylon; takes up only a couple/three square inches on the workbench; includes two drill bits in its tiny handle — and is ideal for drilling all of those small holes with a minimum of fuss and effort. It fits where a standard sized drill won't!

Don't know how things are around **your** house, but my wife views my model making purchases from a dual perspective. If I'm bringing home a new kit, engine or radio, things may get a little tense for a while. But if the box that's delivered to the house by UPS contains tools for the shop, the atmosphere is CAVU (Ceiling And Visibility, Unlimited). Part of this may be attributed to the fact that **tools** may also be used when I build miniature furniture or additions to **her** beautiful "1 inch to the foot" doll house. Of greater interest, however, is what's available at **her** hobby shop when we visit it together. I've found: tiny, sharp scissors and tin snips (for trimming Coverite and aluminum sheet parts); thin, flat copper foil and battery boxes (used by doll house builders to light their miniature lamps and chandeliers — by model builders to wire navigation lights); and small screws, pins and bolts (for model construction — rivets and cowl bolts). Over in the corner of **her** hobby shop I've found a box of Midwest hardwoods, in blocks, strips and sheets. A lot of us use Midwest **balsa,** but I've found that their maple, cherry and basswood are invaluable for scale R/C model purposes. I kind of wish that Midwest would provide bass strips in longer lengths (than the present 12" and 24") because they're ideal for laminating curved model surfaces, like wing tips and rudders. Like the model railroad hobby shops, my bride's doll store carries Northeast woods. Their routed basswood "shapes," like "I"-beams, are great as stab spars. And, their "timbers" are great servo-mounting rails, particularly in the Half-A scale models.

Although I've been concentrating on hobby tools from sources other than the usual model airplane shops, it might pay to examine that wall with all of the **model boat parts** hanging from peg-board fixtures. A couple of years ago, I had a design problem that wouldn't quit. I wanted to make the horizontal stabilizer of my Quarter Scale Ryan B-5 adjustable. In other words, I planned on adjusting the stab incidence in flight, for trim purposes, just like the prototype. With over 400 squares of stabilizer area, I needed a **strong** hinging system. What I found was a couple of model boat steering arms. They look like our usual nosewheel steering arms except that they were metal and were drilled for 3/16ths wire. By imbedding a piece of music wire in the Ryan's stabilizer spar and using the boat steering arms attached to the fuselage structure, I had a variable incidence system that was super strong and smooth to operate. The weak point of the design was the servo attachment mechanism. So, I decided to retain the variable incidence feature, but make it ground adjustable, only. There are a number of other boat "bits and pieces" that adapt readily to model airplane scale construction. If you're interested in engine extension shafts and universal joints — the "boat wall" will provide 'em. If you'd like to build a P-39 or P-63 with the engine mounted mid-fuselage, a boat-type engine mount may be the way to go. For scale seaplanes and amphibians, waterproof radio boxes may easily be fitted, although they're manufactured for scale sailboats!

While you're looking around, don't neglect the parts that are put out for the R/C car enthusiasts. Within our enclosed cowlings, one of our biggest problems is keeping our engines **cool.** The car people solve the problem with heat-sinks or engine heads with extended cooling fins. We can use 'em! On the same subject — you can emulate Jim Meister (the original "Jemco") and use liquid cooling for your R/C engine (with a radiator and water-jacket). It isn't beyond consideration to use R/C car **gears** to construct home-built prop-speed reducers — and turn a bigger propeller on your scale model airplane.

Unless you live in the vicinity of Peterborough, New Hampshire, you can't really drop in on Brookstone's. But the mail order outfit carries some scale model making tools that make our work so much easier. Like: "shavehooks" — the absolutely best tool for hollowing out carved balsa fuselages and cowls I've ever found. My tool box also contains Brookstone's miniature brass thumb-plane (for leading edge forming), a set of surgeons' scalpels (for **very** fine cutting) and a bunch of riffling files (bent-tip files for getting into very close quarters). Case you're interested in these and other purpose designed model making tools, Brookstone's address is: 127 Vose Farm Road, Peterborough, New Hampshire 03458. They'll send you a free catalog that'll drive you out of your model building gourd!

I have to admit, some of the ideas in this column are "far out." Conversely,

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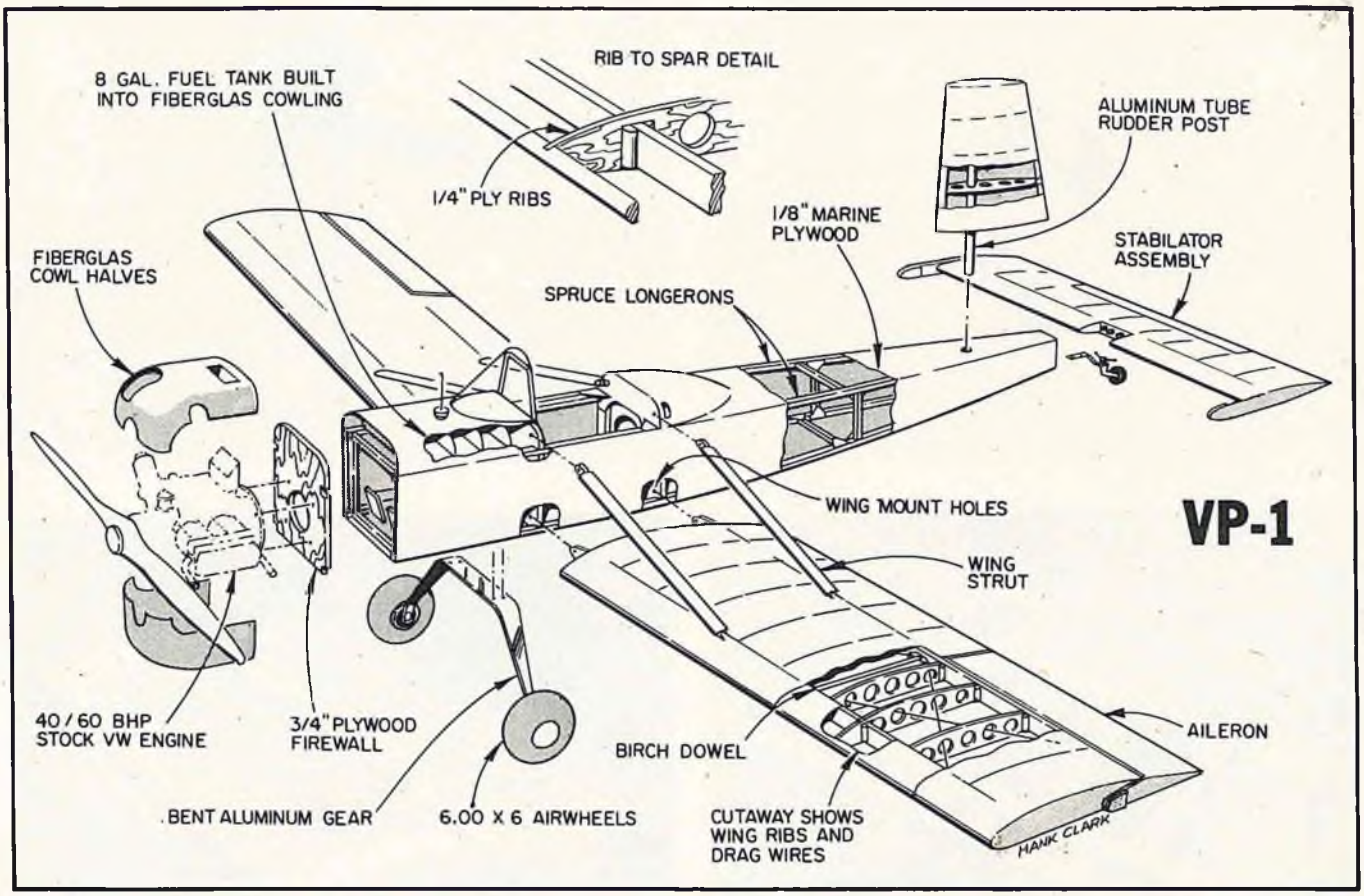
VOLKSPLANE VP-1

Miss Ethne Jean "E.J." McGeehe, a former student of Pauls, shows off the Volksplane.

Try this One Quarter Scale version of the ever popular single place homebuilt.

By Paul F. Denson

The prototype VP-1 was designed in 1966 and built during the following two years by its designer William S. Evans. It was test flown early in 1969 by our modeling friend the "Old Professor," Walt Mooney. Since that time many VP-1's have been home-built all over the country. Stock 'Bug' engines of the 1500 to 2100cc range were used. In 1970 a larger 2-place version, the VP-2 was designed using the 1834 to 2100cc V.W. engines. If you have an interest in the full size or would like a scale reference, a modest fee sent to Evans Aircraft Co., Box 744, La Jolla, California 92037, will bring you a booklet full of pictures and drawings. It is full of information and



specifications regarding the two planes.

We do not remember when the inclination to build a R/C version of the VP-1 finally took hold. We have six or seven magazines all of which contain articles on the VP-1, either full size or models. Most of these magazines are turning yellow so we finally hauled out the butcher paper and tried the VP-1 Quarter Scale.

The original plan was to use an O.S. .60 4-cycle as the power plant but we also wanted to make it as near scale as possible. The weight began building up and at the last moment we switched to a K & B .61. The R/C prototype was flown on both the K & B .61 and an Enya .60. Full throttle was used only on take-off and 1/4 to 1/3 throttle was enough to keep it putting around the sky.

From what we can see of the full scale plane, Evans used modeling technique on a grand scale so all we did was to divide everything by four and use the same technique on a less grand scale. His fuselage was a long 4 stringer box covered with ply; so is ours. He used wing ribs slid on spars; so did we. The only place he departed from modeling technique was to add drag wires and compression struts. They look great and are fun to build, so we did too. The full moving rudder and stabilizer posed quite a problem, but by remembering a few things from mechanics in Physics 101 we were able to keep the movement within reason.

So to construction. This will not be a step by step article — if you need that, you shouldn't be building this plane. It is designed for builders with a fair amount of experience.

The majority of fittings in the wing and on the struts are sold by Proctor Enterprises. You should have his catalog when you start to build so you can see just exactly what each part called out on the plans looks like. You should be able to get all these fittings at your hobby shop.

Much of the wood used in the plane was cut at home. Straight grained soft white pine 1" x 4" x 6' was selected at

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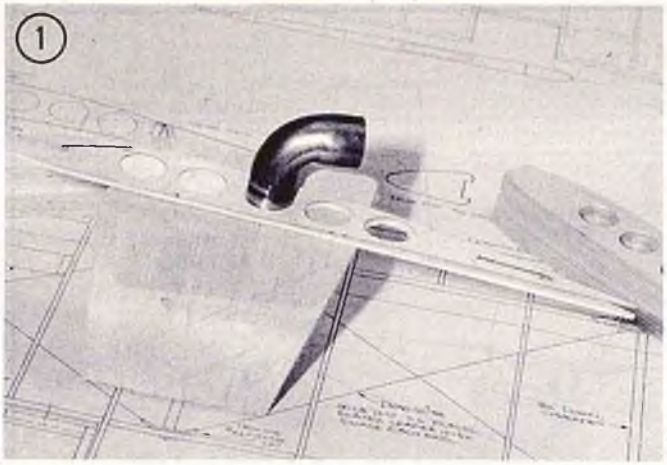
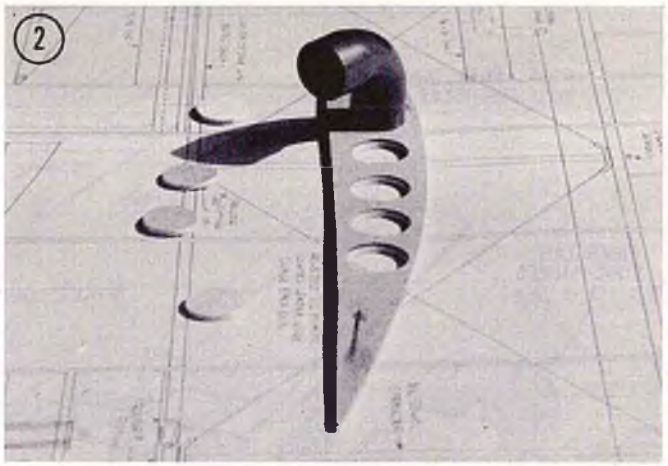
VOLKSPLANE VP-1
Designed By: Paul F. Denson

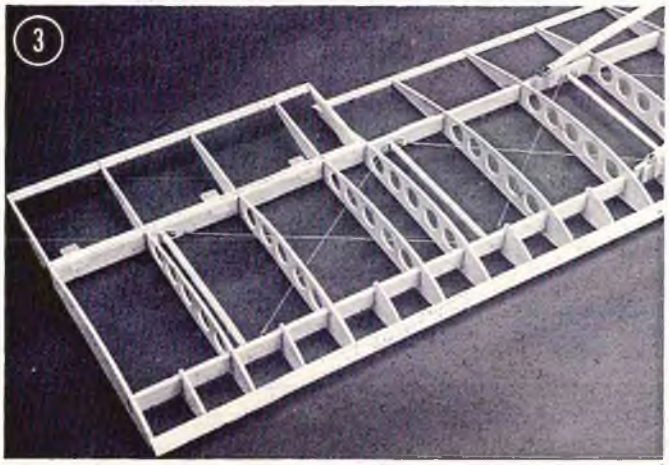
TYPE AIRCRAFT
Stand-Off Sport Scale
WINGSPAN
72 Inches
WING CHORD
12"
TOTAL WING AREA
864 Sq. In.
WING LOCATION
Low Wing
AIRFOIL
NACA 4412
WING PLANFORM
Constant Chord

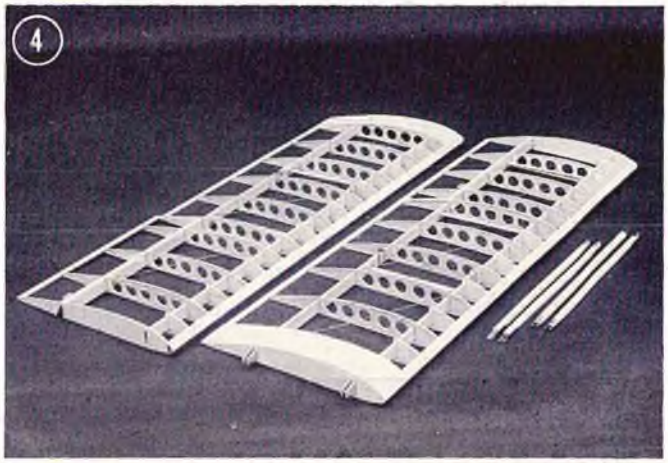
DIHEDRAL EACH TIP
3 Inches
O.A. FUSELAGE LENGTH
55 Inches
RADIO COMPARTMENT SIZE
(L)12" x (W)5" x (H)4"
STABILIZER SPAN
24 Inches
STABILIZER CHORD (incl. elev.)
7"
STABILIZER AREA
168 Square Inches
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
10 Inches

VERT. FIN WIDTH (incl. rud)
7" (Avg.)
REC. ENGINE SIZE
.60-.61 cu. in.
FUEL TANK SIZE
10-12 Ounces
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Ail., Throt.,
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Spruce, Balsa & Ply
Wing ..... Balsa & Ply, Spruce
Empennage ..... Balsa & Spruce
Wt. Ready To Fly ..... 132 Oz.
Wing Loading ..... 22 Oz./Sq. Ft

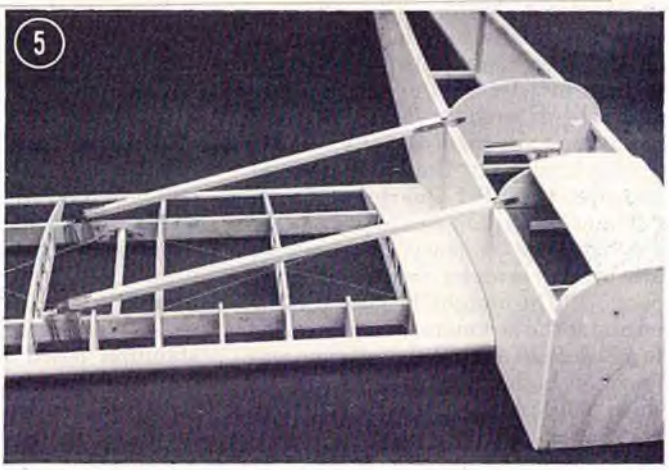


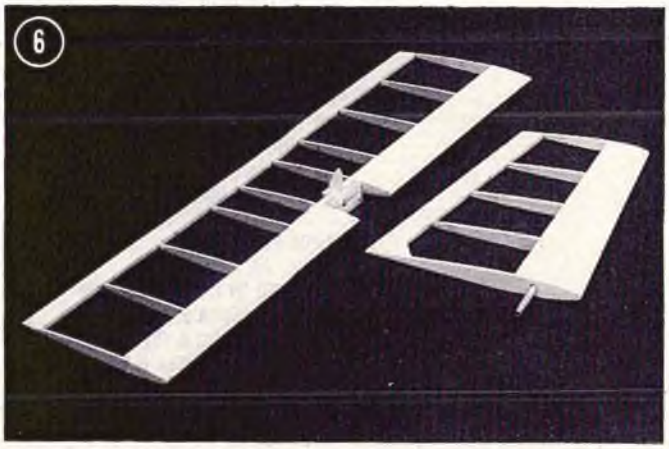


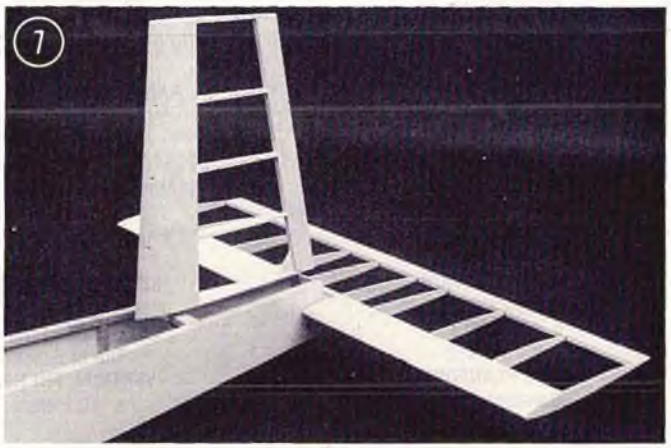


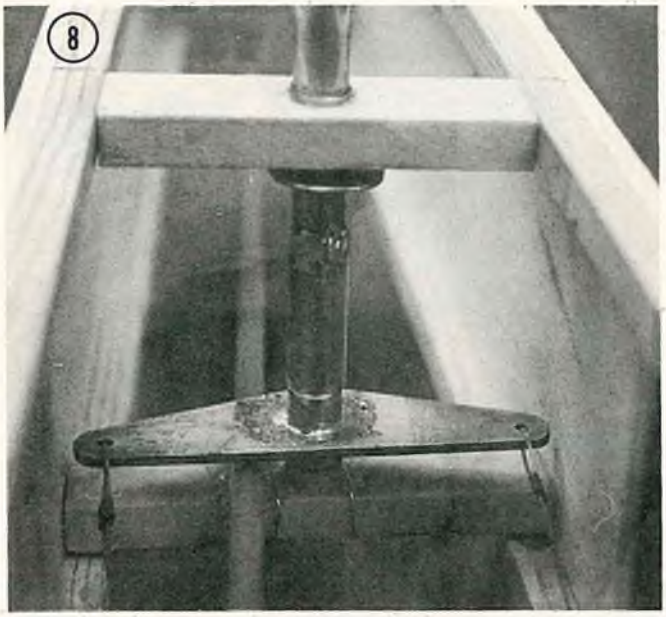


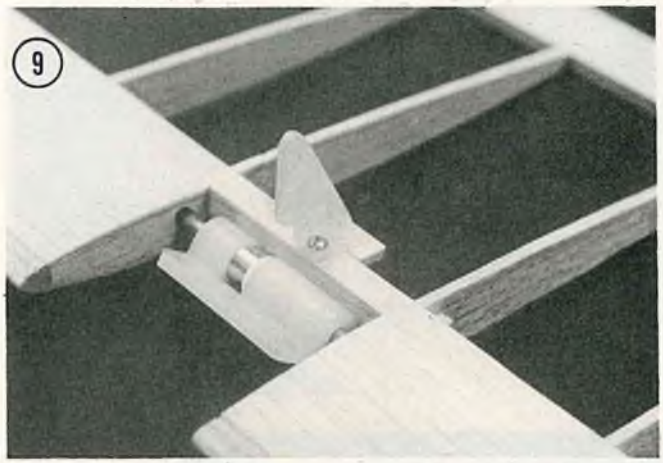
(1) Plummers copper elbow hole cutter. Note block of balsa, using end grain, gives cleaner cut. (2) Hole cutter, completed rib with ply template used as guide. (3) Right wing panel showing internal details, aileron shown in the up position. (4) Both wing panels complete with struts. (5) Right wing in place with struts attached. (6) Completed tail assembly ready to attach to fuselage. (7) Tail group in place on fuselage to complete control linkage hook-up. Rudder is by cable.

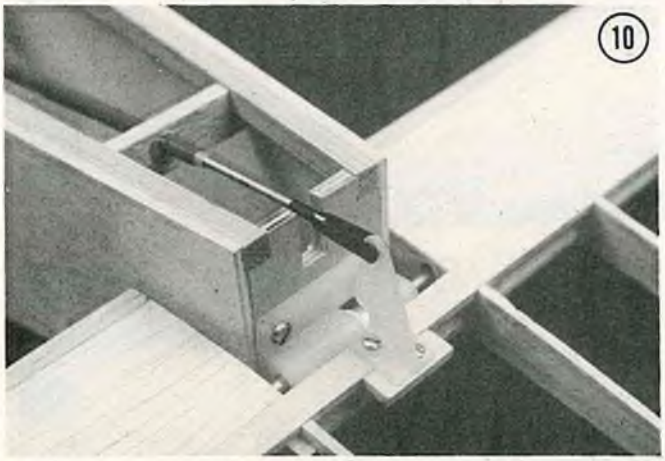


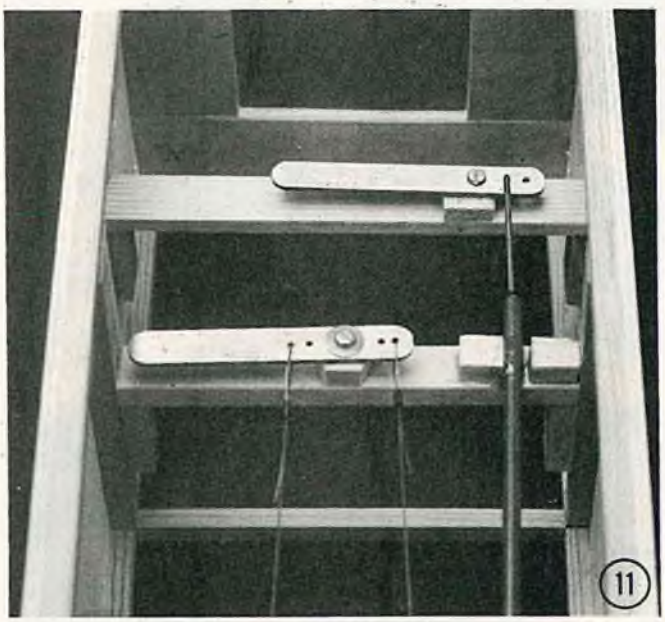


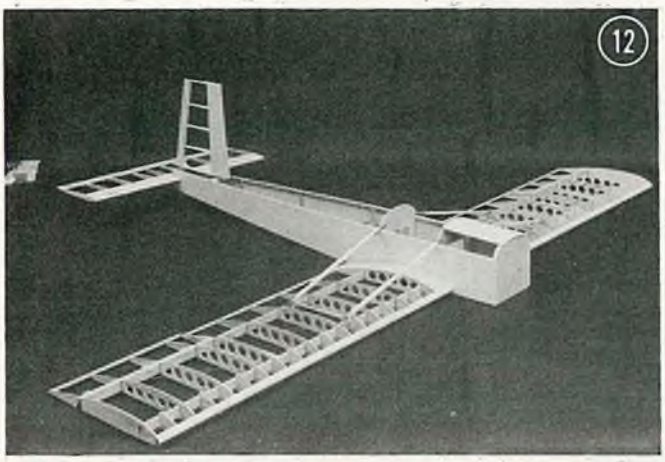




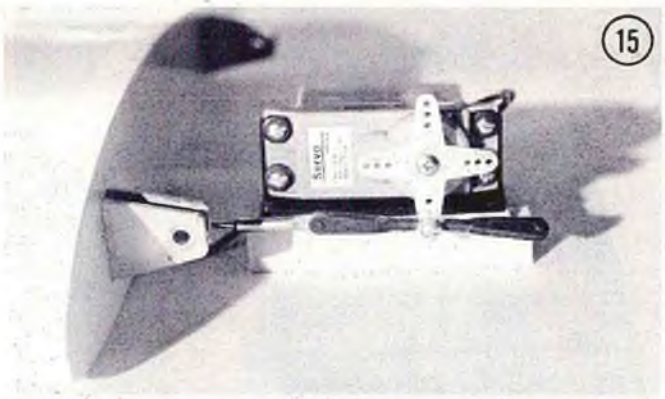


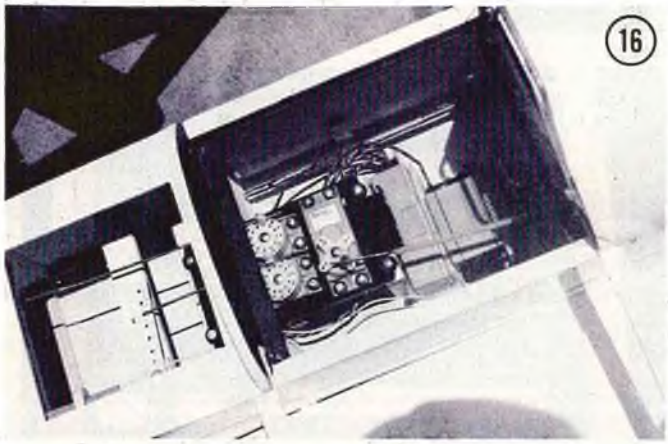


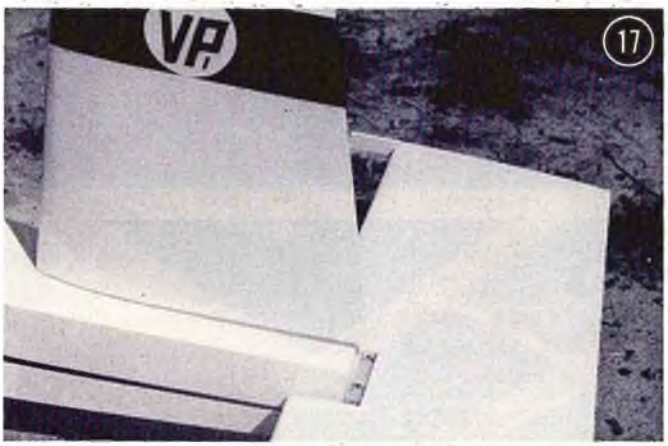




(8) Rudder post shown inside of fuselage. Rudder sits on post and is cable controlled. (9) Nose wheel bearing is used to connect elevator to rear of fuselage. (10) Bottom view of fuselage showing elevator attached to rear of fuselage. Very neat arrangement. (11) Tail surface bellcranks. Top one is elevator and lower is rudder. (12) We all do some bench flying while building. Is that why it takes so long sometimes? (13) Spring loaded pin to secure wing panel to fuselage.

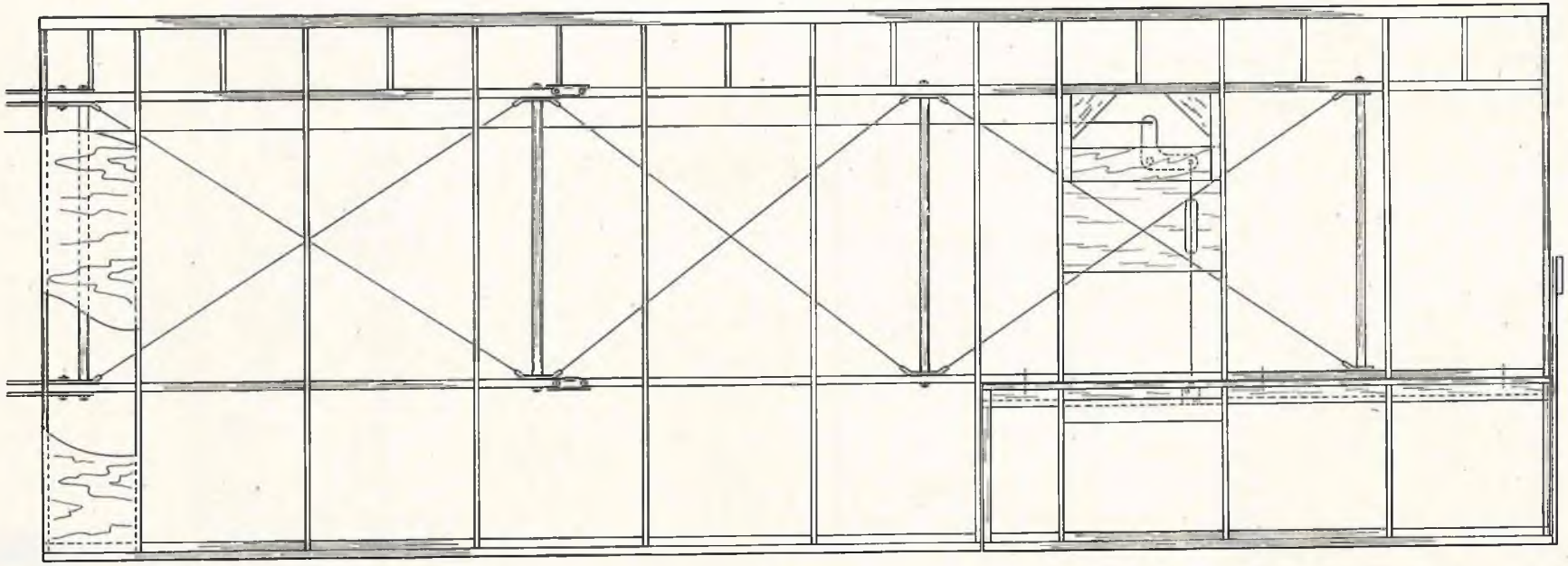


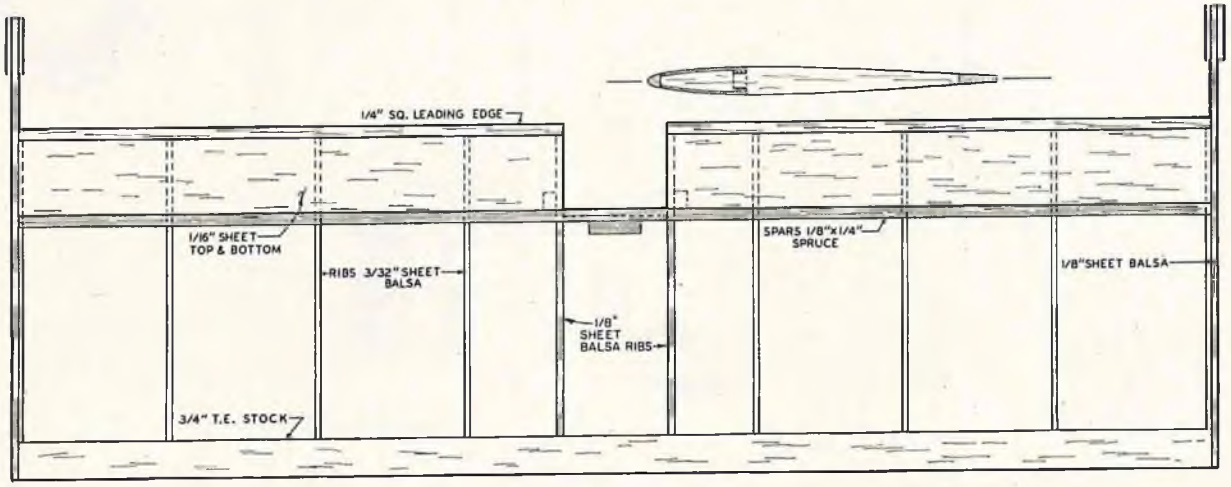




(14) Tatone muffler blows exhaust out the cowl opening in bottom. Note crossed L/G brace wires. (15) Designers method of attaching servo to aileron pushrods. (16) Cockpit floor and rear turtle deck removed to show radio installation. Note left wing securing pin. (17) Finished and covered tail section. Very clean installation. (18) Close-up of cockpit area. Builder can go as far as they want. Full size is very simple. (19) Close-up of dummy VW engine. Adds much realism to model. (20) Completed model makes a beautiful One Quarter Scale model. (21) The Quarter Scale Walt Mooney is out for 1/4 of a sandwich. No need to look for him Paul.

FULL SIZE PLANS AVAILABLE — SEE PAGE 204





VOLKSPLANE VP1

1/4 SCALE

RC DESIGN BY	PLANS BY
PAUL F. DENSON	PAUL F. DENSON

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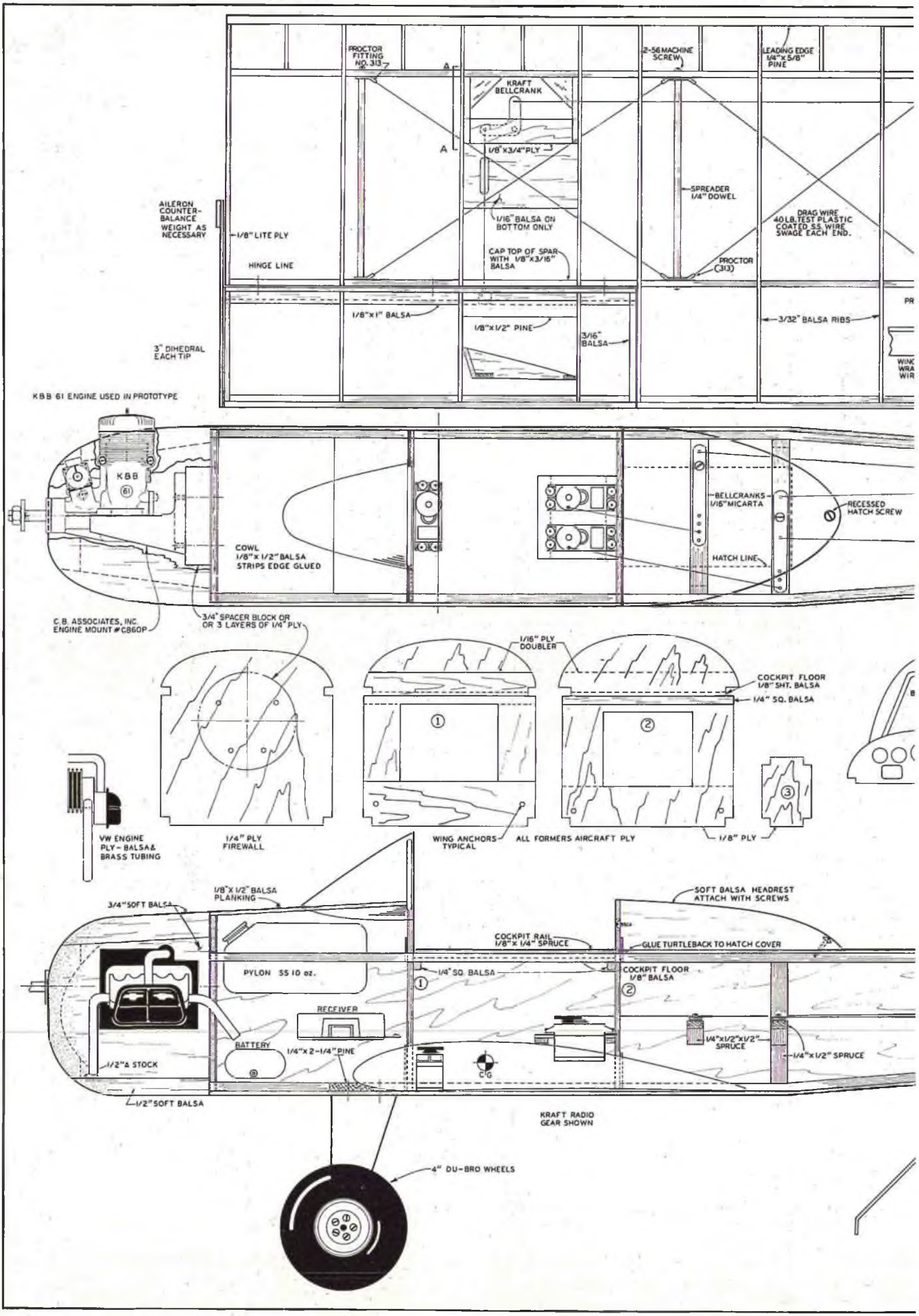
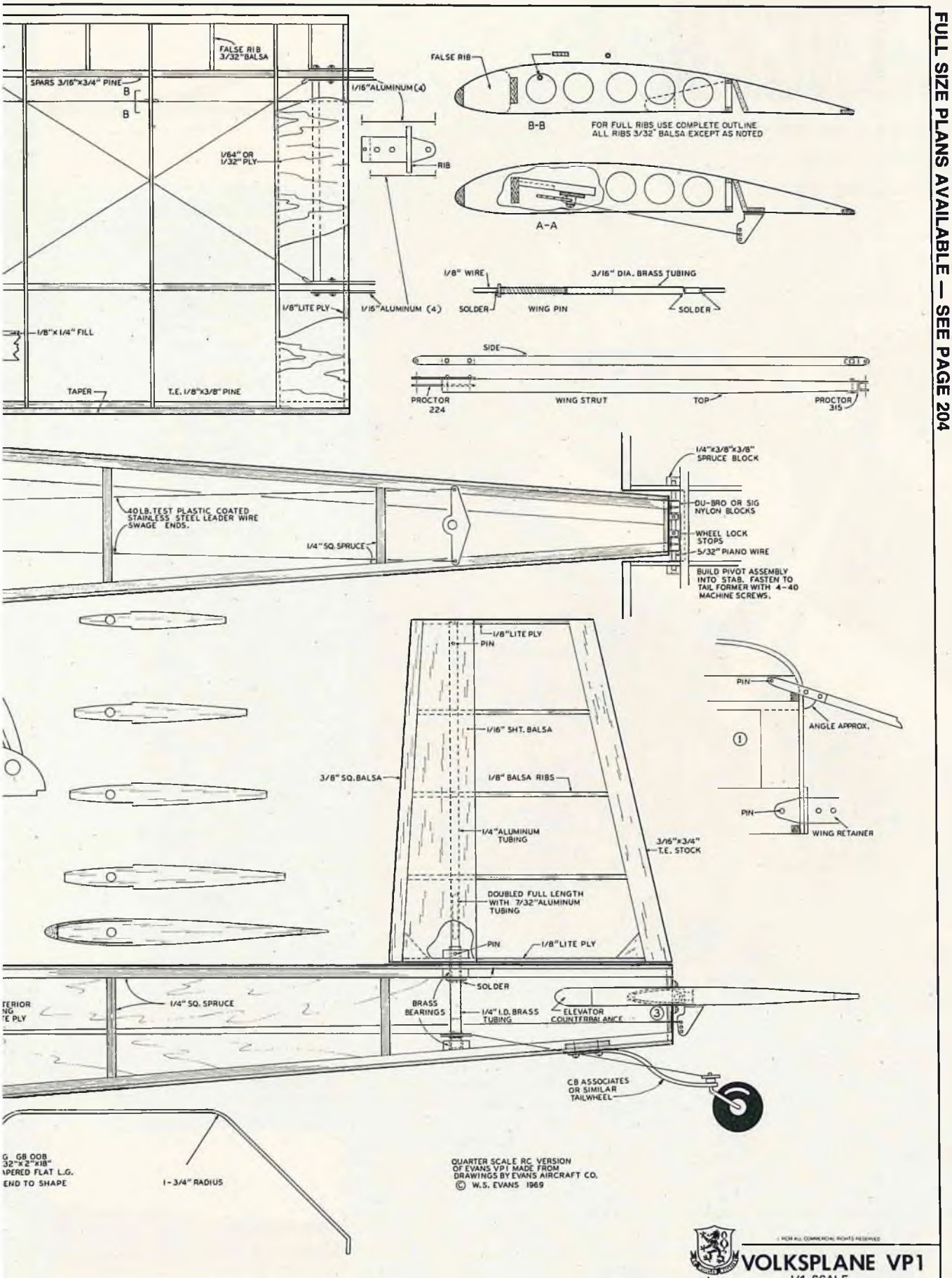
PLAN NO. 882 ②


PROCTOR FITTING NO. 313
A
A
KRAFT BELLCRANK
1/8"x3/4"PLY
2-56 MACHINE SCREW
LEADING EDGE 1/4"x 5/8" PINE
SPREADER 1/4" DOWEL
DRAG WIRE 40 LB. TEST PLASTIC COATED SS WIRE SWAGE EACH END.
AILERON COUNTER-BALANCE WEIGHT AS NECESSARY
1/8" LITE PLY
HINGE LINE
1/16" BALSA ON BOTTOM ONLY
CAP TOP OF SPAR WITH 1/8"x3/16" BALSA
PROCTOR (313)
1/8"x1" BALSA
1/8"x1/2" PINE
3/16" BALSA
3/32" BALSA RIBS
3" DIHEDRAL EACH TIP
KBB 61 ENGINE USED IN PROTOTYPE
KBB
61
COWL 1/8"x 1/2" BALSA STRIPS EDGE GLUED
BELLCRANKS 1/16" MICARTA
RECESSED HATCH SCREW
HATCH LINE
C.B. ASSOCIATES, INC. ENGINE MOUNT # C860P
3/4" SPACER BLOCK OR OR 3 LAYERS OF 1/4" PLY
1/16" PLY DOUBLER
COCKPIT FLOOR 1/8" SHT. BALSA
1/4" SQ. BALSA
1
2
3
VW ENGINE PLY - BALSA & BRASS TUBING
1/4" PLY FIREWALL
WING ANCHORS TYPICAL
ALL FORMERS AIRCRAFT PLY
1/8" PLY
1/8"X 1/2" BALSA PLANKING
3/4" SOFT BALSA
SOFT BALSA HEADREST ATTACH WITH SCREWS
COCKPIT RAIL 1/8"x 1/4" SPRUCE
GLUE TURTLEBACK TO HATCH COVER
PYLON 55 10 oz.
1/4" SQ. BALSA
COCKPIT FLOOR 1/8" BALSA
RECEIVER
BATTERY
1/4"x 2-1/4" PINE
1/4"x1/2"x1/2" SPRUCE
1/4"x 1/2" SPRUCE
1/2"A STOCK
C G
1/2" SOFT BALSA
KRAFT RADIO GEAR SHOWN
4" DU-BRO WHEELS



VOLKSPLANE VP1

1/4 SCALE

R.C. DESIGN BY	PLANS BY
PAUL F. DENSON	PAUL F. DENSON

0 1 2 3 4 5 6

PLAN NO. 882 ②

FULL SIZE PLANS AVAILABLE — SEE PAGE 204

PRANCER

The Prancer is a unique looking aircraft and will do all the good things you are looking for.

The countryside near Lexington, Kentucky, creates a pleasant setting for the Prancer, displayed by Cora Rogoyski.

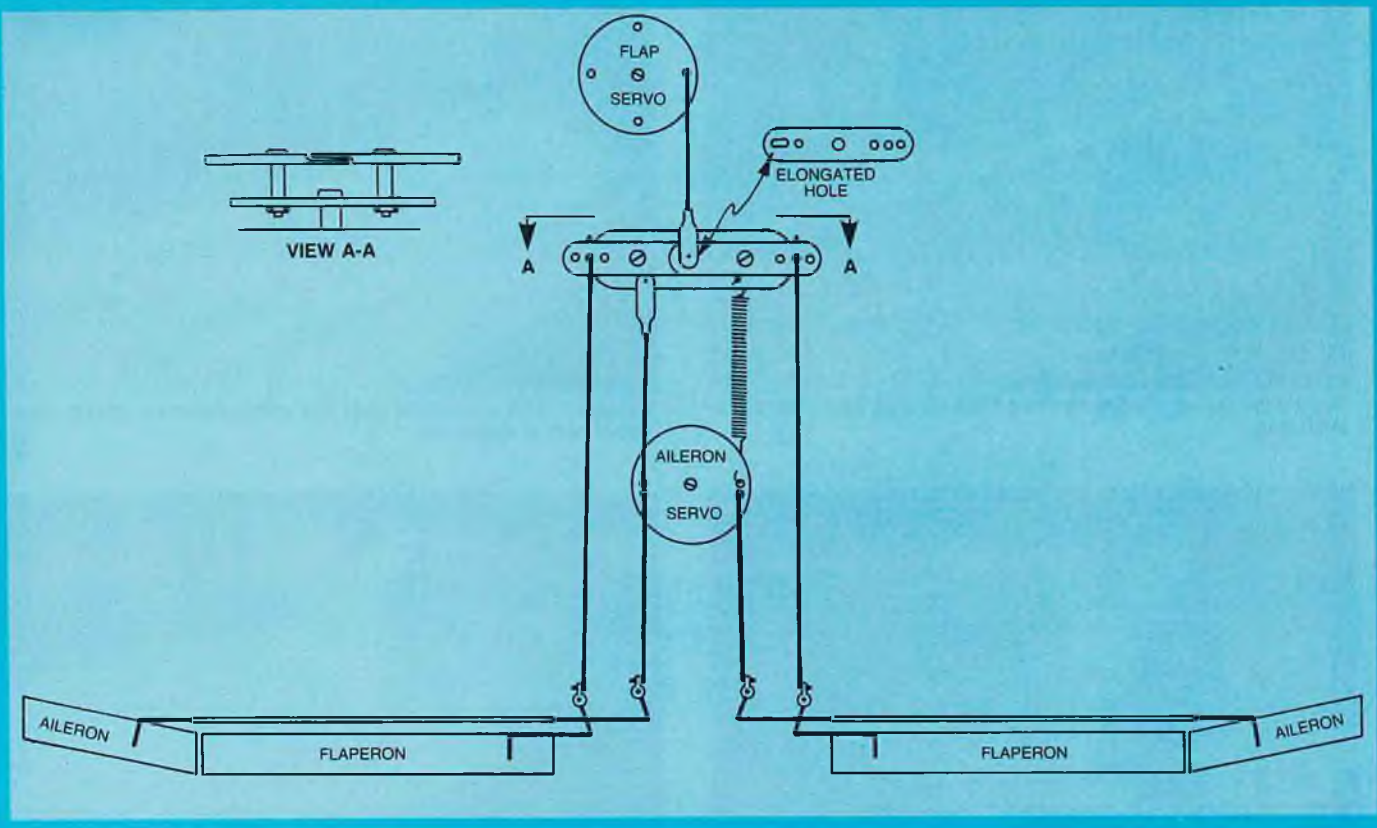
By Francis R. Rogoyski

Lightweight, super sleek, economical, aerobatic — all these terms describe the Prancer, a five-foot low wing design that flies nicely on a .35. The Prancer floats like a sailplane and flies as well inverted as it does upright. The plane is designed for 5 channel operation, the fifth channel being used for flaperons.

Since the Prancer was my first low wing plane (my only other RC flight experience was with a Falcon 56 Mark II) and I had no trouble handling it, I guess I could safely classify it as a low wing trainer. This was also my first attempt at design, so I played it safe by using a flat bottom wing, and by keeping the construction light. I flew the original version for a year before deciding to build another and write this article. Although the planes look alike, many subtle changes have been incorporated into the new model. Nothing major; just all the little things my 20/20 hindsight told me I should have done differently.

text to page 47

PRANCER
Designed By: Francis R. Rogoyski
TYPE AIRCRAFT
Sport/Trainer
WINGSPAN
59½ Inches
WING CHORD
11½ Inches
TOTAL WING AREA
675 Sq. In.
WING LOCATION
Low Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
Tapered Tips
DIHEDRAL EACH TIP
1¾ Inches
O.A. FUSELAGE LENGTH
49 Inches
RADIO COMPARTMENT SIZE
(L)12" x (W)3½" x (H)5½"
STABILIZER SPAN
23¼ Inches
STABILIZER CHORD (Inc. elev.)
6" (Avg.)
STABILIZER AREA
148 Sq. In.
STAB. AIRFOIL SECTION
Semi-Symmetrical
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
6¾ Inches
VERTICAL FIN WIDTH (Inc. rud.)
5¼" (Avg.)
REC. ENGINE SIZE
.35-.40 Cu. In.
FUEL TANK SIZE
6 Oz.
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
5
CONTROL FUNCTIONS
Rud., Elev., Ail.,
Throt., Flaps
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa & Ply
Wing ..... Balsa, Spruce & Foam
Empennage ..... Balsa, Foam
Wt. Ready To Fly ..... 88 Oz.
Wing Loading ..... 18.2 Oz./Sq. Ft.



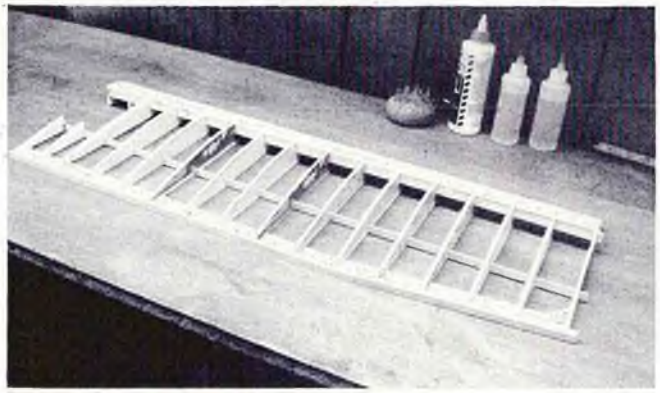
Bill Of Materials

Fuselage
3 — 1/8 x 4 x 48 Side Panels
2 — 1/16 x 6 x 12 Plywood Doublers
1 — 1/8 x 4 x 36 Top Sheeting
1 — 1/8 x 4 x 24 Bottom Sheeting
1 — 1/4 x 1/4 x 28 Top Spar
1 — 1/8 x 6 x 12 Ply Formers & Dihedral Braces
1 — 1/8 x 6 x 12 Ply Formers (Lite Ply)
1 — 1/8 x 4 scraps Former "A" & Wing cut-out doublers

Wing
2 — 5/16 x 5/16 x 36 Leading Edge
2 — 1¼ x 1¼ x 11 Wing Tip Blocks
2 — 1/4 x 1/2 x 36 Forward Spar — Spruce
2 — 1/8 x 3/8 x 36 Rear Spar — Spruce
2 — 3/8 x 3/8 x 36 Trailing Edge
2 — 1¼ x 36 Tapered Stock
2 — 1/16 x 3 x 36 Top Leading Edge Sheeting
2 — 1/16 x 3 x 36 Bottom Leading Edge Sheeting
2 — 1/16 x 1 x 36 Bottom Trailing Edge Sheeting
1 — 1/16 x 4 x 36 Cap Strips (cut 3/8" wide strips)
1 — 1/16 x 4 x 24 Top & Bottom Center Sheeting
1 — 1/4 x 6 dowel for locator pegs
Foam meat trays, egg carton tops, or foam board for ribs

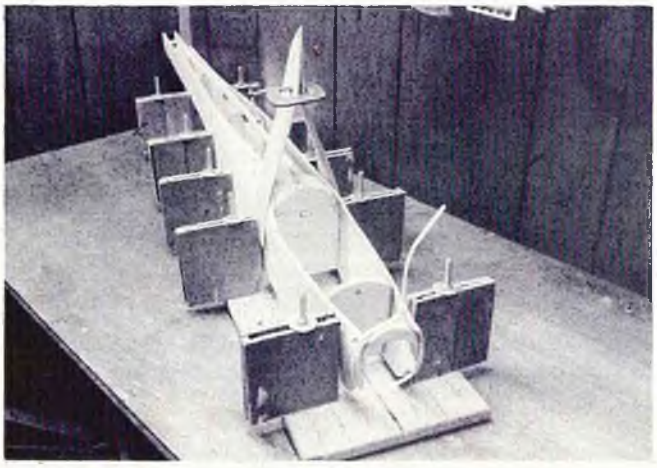
Stabilizer
1 — 1¼ x 24 Tapered Stock
1 — 1/4 x 5/16 x 24 Trailing Edge
1 — 1/4 x 1/4 x 24 Leading Edge
1 — 1/2 x 1/2 x 8 Tip Blocks
1 — 1/8 x 5/16 x 24 Spar — Spruce
1 — 1/16 x 1¼ x 12 Top Sheeting
1 — 1/16 x 3 x 6 Bottom Sheeting
1 — 1/8 sheeting for center ribs
Foam meat trays, egg carton tops, or form board for other ribs
1/16 x 3/16 cap strips
2 — 1 x 12 x 1/16 Top Leading Edge Sheeting

Fin & Rudder
1 — 3/16 x 4 x 24 Sheet

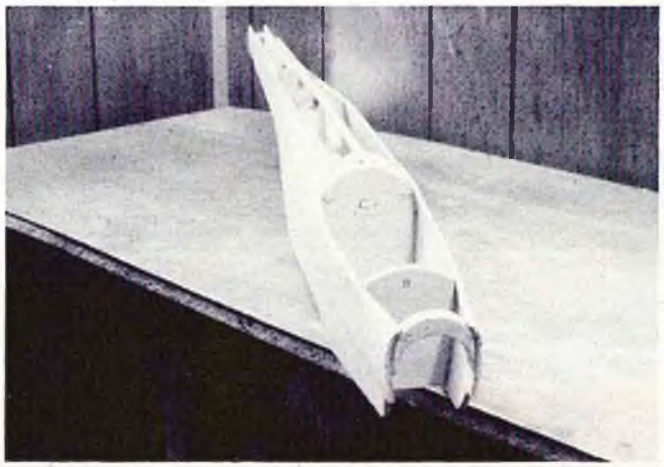


Right wing panel — note ribs cut from various egg cartons or meat trays.

Designer built one panel over the other, however, plans now show both wing panels.

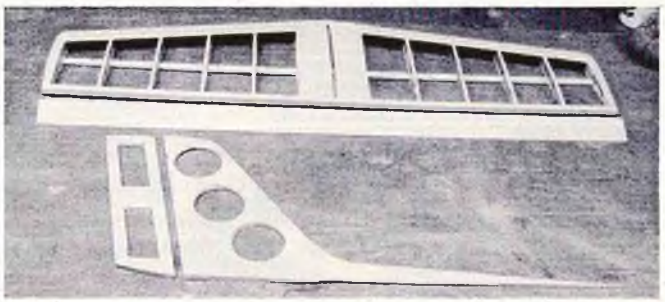


Fuselage being built in an RCM fuselage jig (Feb. 1972).



Fuselage removed from jig and ready for additional planking.

Top sheeting being added to fuselage — note nylon ties along with pins used to secure balsa to basic frame.



Tail group completed — stab also uses foam ribs with balsa cap strips.

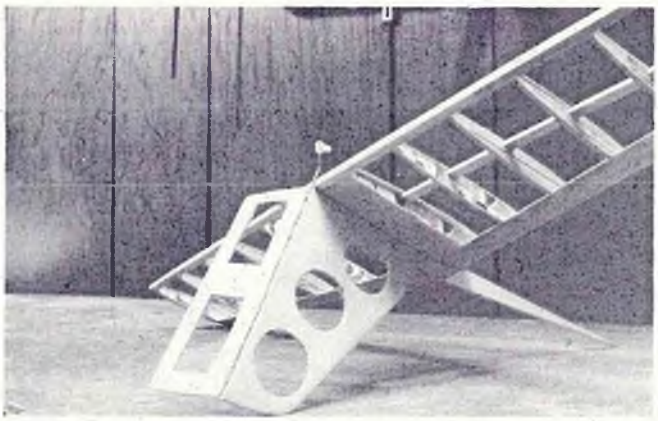
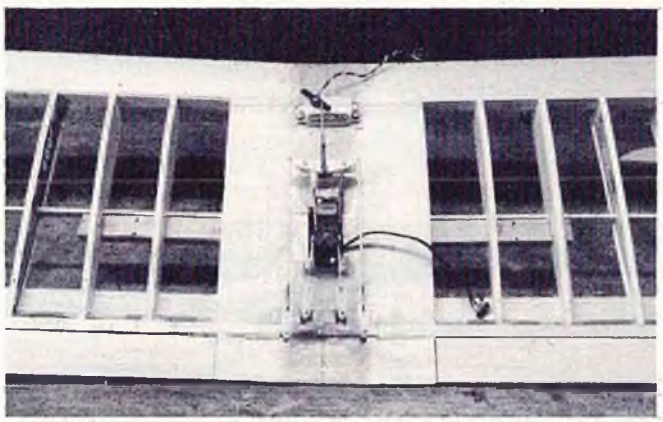
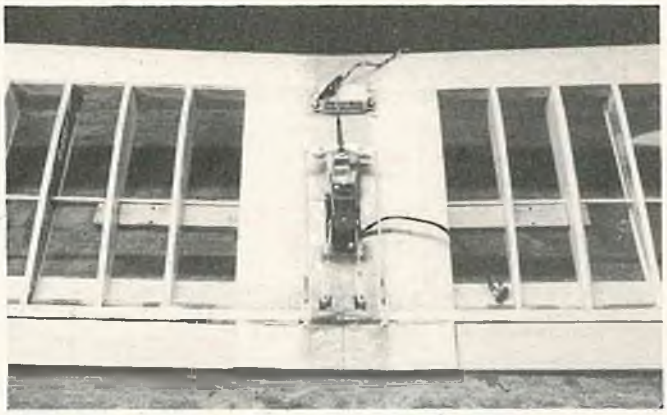


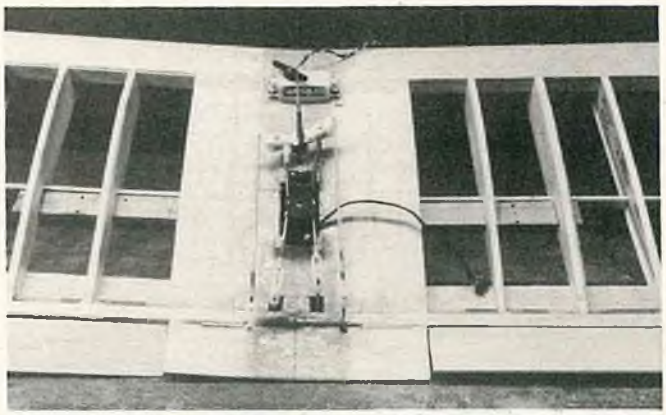
Photo shows rudder control horn.



This installation was on second version. This differs from plans. Sketch shown in text for this set up. Flaps are in up position.

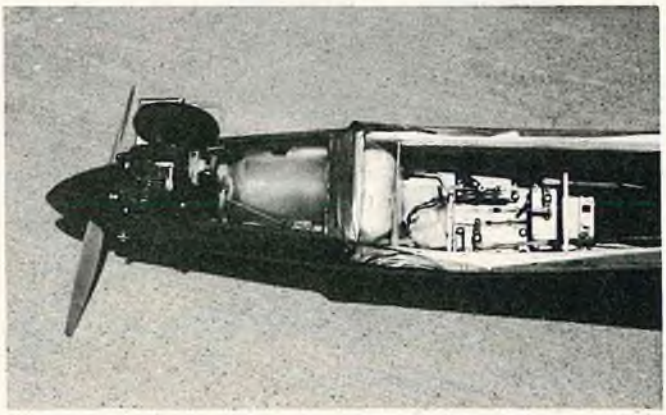


This shows linkage position when flaps are down.



Linkage shown in right turn with right flaperon in up and left in down.

Photo showing tank hatch removed for easy access to tank and nose gear — note nose wheel brake cable.



Ample room for most any servos — designer did a very neat installation.

When I built the original version I owned only a 4 channel radio, so I tied down the rudder (which I had never learned to use anyway), and used the fourth channel for the flaperons. Nosewheel steering was accomplished via the aileron servo, with the nosegear mounted on a forward extension of the wing.

Construction

Build the wing panels over the plans and let the glue dry. Note that the center portions of ribs 1 and 2 have been cut out. These should be inserted after the wings have been joined and the dihedral braces are in place. Be sure to use 1/16" capstrips if you use foam ribs. These add strength and act as heat sinks, allowing the use of iron-on coverings. The ribs on the plans have been undercut for 1/16" wood all around.

Cut out the fuselage panels and 1/16" plywood doublers. The doublers go from the nose back (F1) to former F3. Score the insides of the doublers lengthwise, in the area from former F2 to former F1. The plywood must be able to follow the contour of the nose, which matches that of a 2½" spinner. Using contact cement, glue the fuselage doublers in place, remembering to make a left side and a right side.

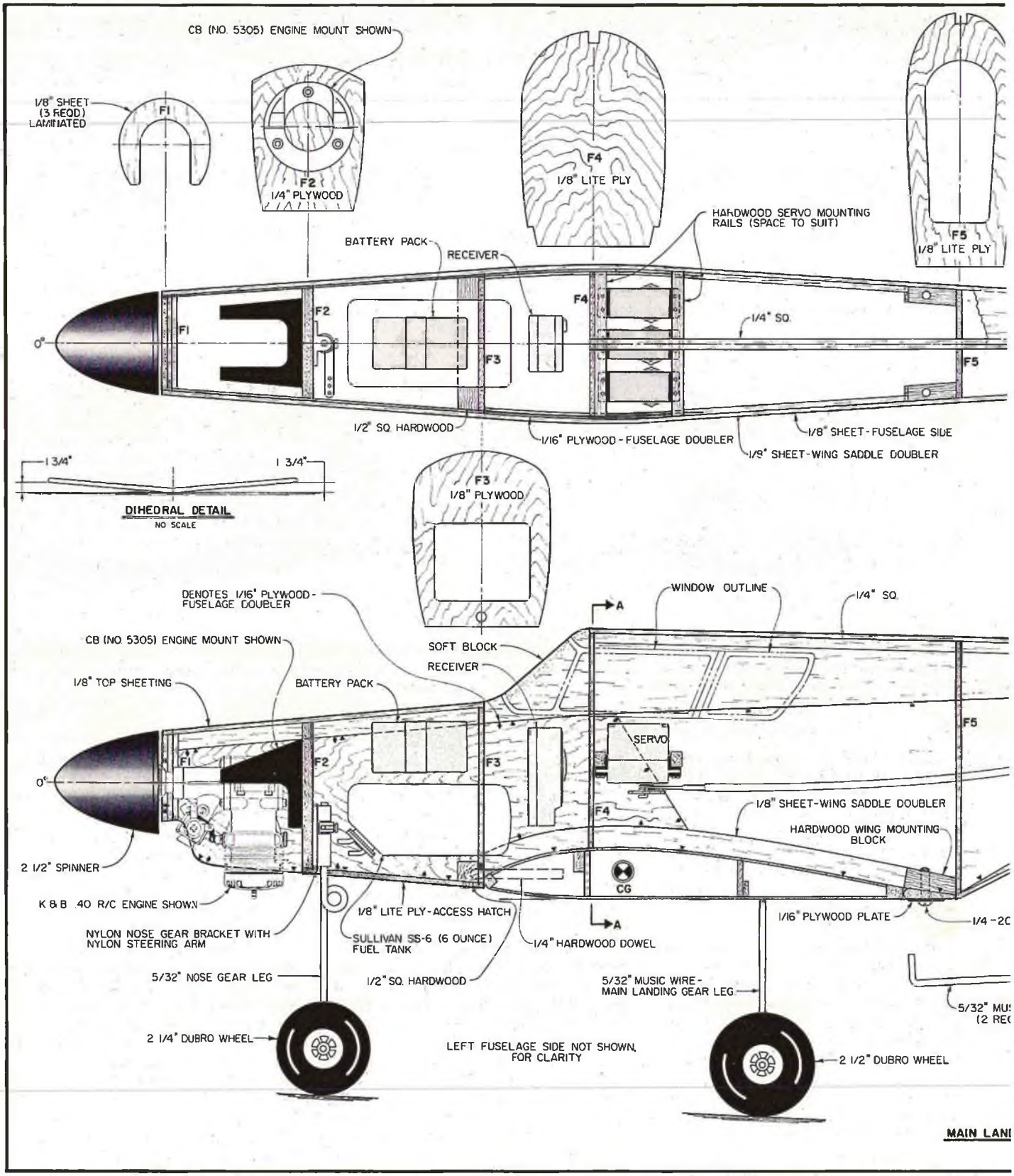
Make former F1 from three pieces of 1/8" balsa laminated together. This former will be slightly oversized, and must be tapered and custom fitted to the curve of the fuselage. Former F2, the firewall, is made from 1/4" plywood. The remaining formers are cut from 1/8" plywood, and 1/8" lite ply.

A fuselage jig comes in very handy when building this fuselage, because of the curves. Use 5-minute epoxy to glue the balsa sheeting to the formers. Start by gluing the bottom halves of formers F4 and F5 to the side panels. Formers F6 through F9 come next, followed by F1, F2, and F3. The fuselage side may split when you wrap it around former F1 but that's what plastic balsa and micro-balloons are for. I found that a plastic wire tie makes a perfect gluing clamp for former F1. Glue the top stringer in place. As you sheet the top and bottom of the fuselage, first soak each piece and form to the required shape. Again, plastic wire ties come in handy here. Incidentally, to remove the wire ties, grasp the clamp end near the clamp with long nose pliers and push toward the clamp. The top nose sheeting should be installed at this time. Use a soft balsa block to form the front windshield. Make a hatch for the fuel tank area. Leave the rear end of the fuselage open. The elevator link can be routed straight out the back, and the receiver antenna can be threaded inside the fuselage and attached near the rear end.

Stabilizer construction is straightforward. Build it on the plans. I used foam ribs and capstrips here also, except the two center ribs which were made from 1/8" balsa. Cut the fin and rudder from 3/16" sheet balsa. Taper the leading edge of the fin and trailing edge of the rudder, then cut out the optional lightening holes as indicated if so desired. The circular holes in the fin can be made very easily with a hole saw of the variety that fits in an electric drill. First make a hole for the guide bit, then insert the hole saw and turn clockwise, by hand. The rudder linkage can be brought out under the elevator if desired. Use a threaded link bent like a strip aileron linkage.

Aileron — Flaperon Linkage:

The plane has been flying for over a year now and the aileron-flaperon linkage has proven itself; it has had no failures. I did make one mistake which I will warn you about. I used clevises

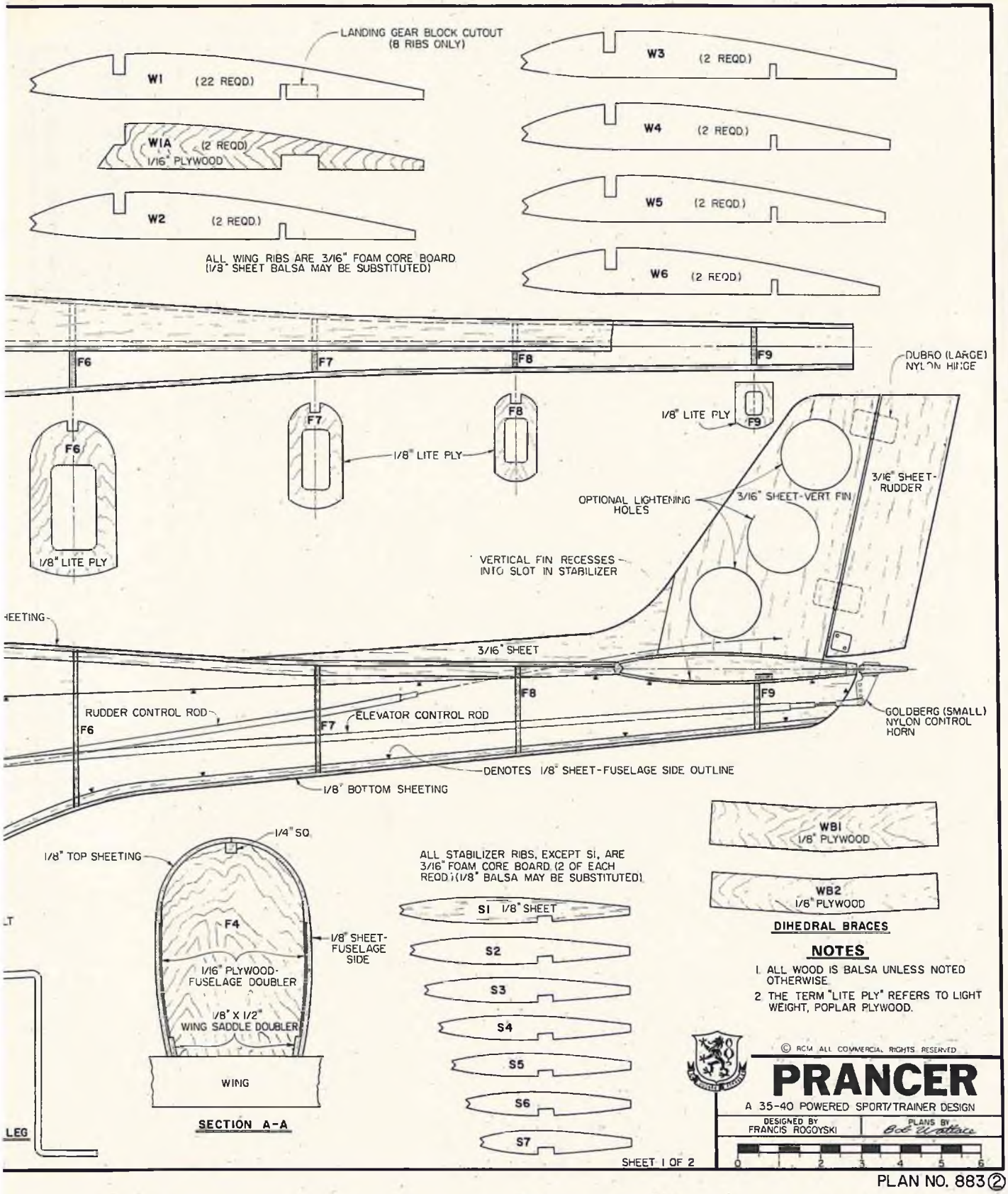


at the bellcranks. Don't do it! I banged the wing against my car door once and popped one of those clevises. That meant major surgery on my Coverite to reconnect the clevis.

The principle of operation is fairly simple: an aileron bellcrank is mounted on a flap bellcrank. When the flap bellcrank is operated as shown, the rest position of the flaperon changes. The aileron bellcrank will function normally regardless of the rest position of the flaperon. It is, however, easier said than done. The next few paragraphs describe some important points to consider when using this mechanism.

The flap servo should be put on an auxiliary channel that has a trim tab type actuator. Flap servo throw must be limited so that the additional motion transmitted to the flaperon by the aileron servo will not bind off the flaperon.

The position of the aileron linkage is important. The bellcrank end of the aileron servo link must be free to move



PLAN NO. 883②

laterally and should be positioned so that operation of the flap bellcrank causes the link to move through its "straight" position as indicated. This reduces any differential effects when the flap servo is operated.

Standard servo arms will work fine for strip ailerons. For the split aileron-flaperon arrangement shown here, a special hook-up is required to accept the extra links at the aileron servo. Trace the motion from the aileron servo to both ailerons and you will see that all links must be connected to the same side of the servo. I used a bi-level servo arm. An alternative is to make a special link.

The aileron/flaperon linkage shown on the plans works fine and was used in the original Prancer. I decided to use torque rods on a new model and came up with the linkage shown in the photos and accompanying diagram. Note the use of an extension spring from the mixer leverage to the aileron servo. This serves to bias out any

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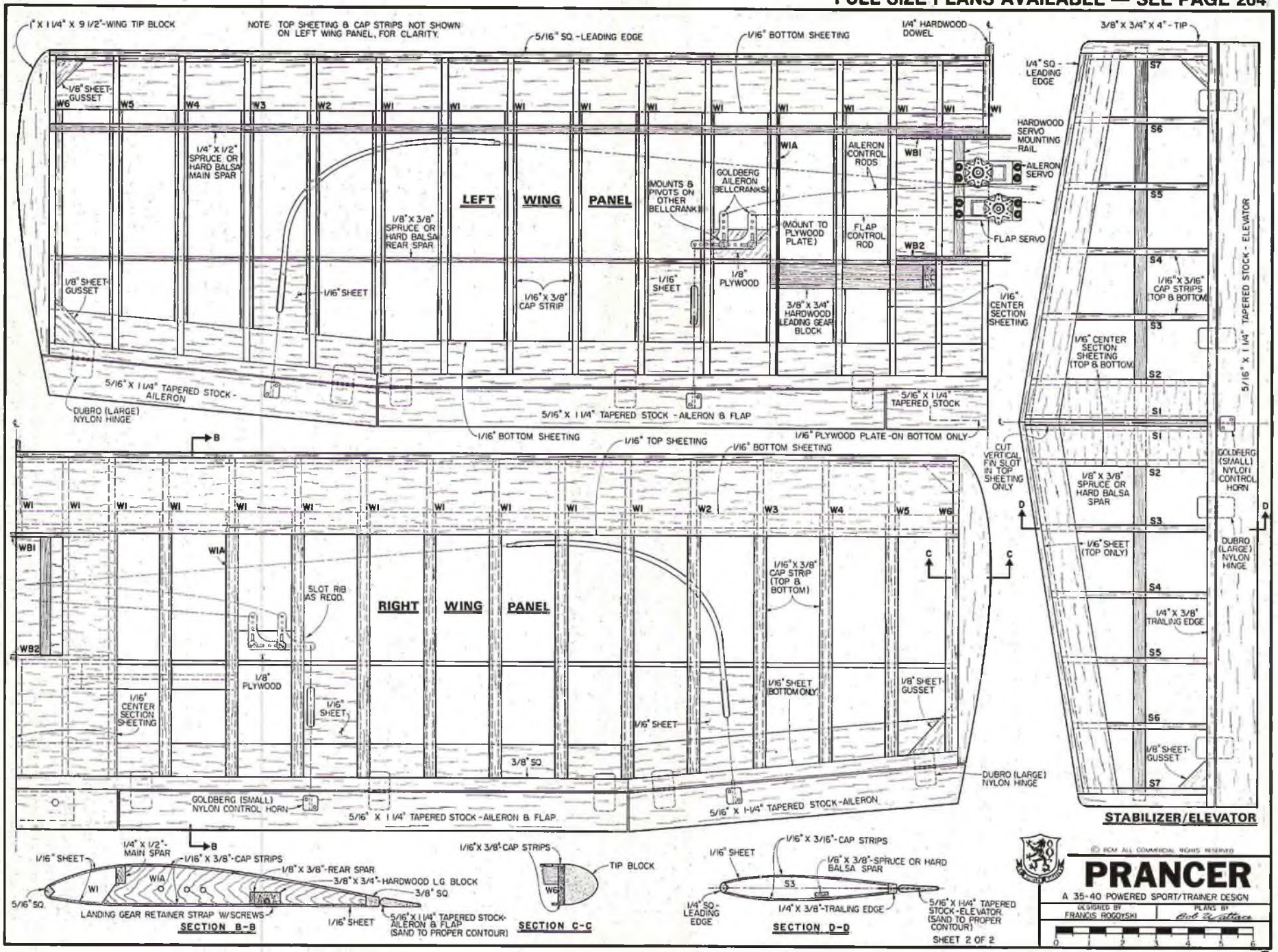
FULL SIZE PLANS AVAILABLE — SEE PAGE 204



PLAN NO. 883②

SILENT POWER

Jim Zarembski

Steve Crow's Hurricane in bare framework — excellent workmanship.

Steve's finished Hurricane. Looks like the real thing.

Electric Power In The Milwaukee Area

Last fall I had the opportunity to visit the Milwaukee area and meet Mel and Dick Thomas. I had corresponded with Mel prior to this trip, and you may recall the tantalizing photographs of several of the Thomas' electrics in the last Silent Power. Mel and Dick are a father-son team. Mel was a modeler as a youngster, and progressed from free-flight and control line to pulse rudder R/C in the late fifties. Mel quit R/C at that time, and hadn't considered building model aircraft again until 1979, when he stumbled onto a copy of Bob Boucher's fine book on electric power: "The Quiet Revolution." Mel and son Dick became obsessed with electric motors, airplanes, and light radios.

They built a Super Monterey and learned to fly with it. This has been followed by about twenty electrics in the last three years. Both Mel and Dick have backgrounds in tool design and die making. Together they run a small stamping company. The attention to detail that a die maker must have is carried into their model building activities. The Aeronca C-3,

Mel, left, and son Dick Thomas searching for electric fliers in Wisconsin: Could you be one? See text.

Mel built this Astro 15 geared Pou Du Ciel from RCM Plans.

Dick and Mel with RCM Wasp and original design sailplane.

Dick Thomas built this prototype Wasp from Jim Zarembski's plans. Wasp will be a construction article in RCM in the near future.

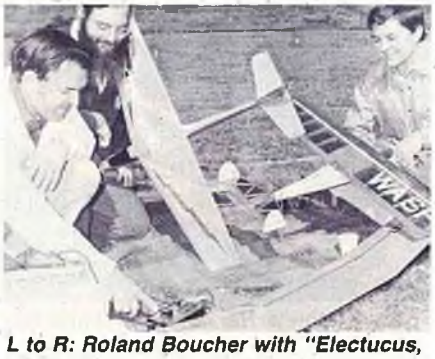
The skies of Milwaukee are buzzing with Mel Thomas' Poterfield built from the Astro kit. Astro 15 with belt drive, a good flier!

This Thomas original design is a 450 sq. in. Astro 05 Cobalt powered ship covered with Mica film. It uses 7 cells and an 8/4 prop — it climbs like the devil!

Mel has over 300 flights on this bird, 600 sq. in., 54 oz., geared Astro 075 with 12 550 mA cells, Futaba 3 channel, 11/8 Rev-Up prop. It will do consecutive loops from level flight. Many thermal flights of over 30 minutes.

Flight line at the KRC Electric Fly, Sunday September 19, 1982, Hatfield, Pennsylvania.

Charlie Hampton of Englewood, New Jersey, with helicopter powered by two Mabuchi motors.



L to R: Roland Boucher with "Electucus, Keith Shaw with the "Barbarian," and Jim Zarembski discuss digital charging at KRC Electric Fly.

Fidel Castro at KRC event launching Cuban Barbarian — oops, that's Keith Shaw.

Silent Power Editor, Jim Zarembski, heaves Mini Bird of Time into the sky.

China Clipper by Jim Pentimall.

the Pou Du Ciel and their Playboys were exquisite. In a flying session we were joined by other electric fliers from Northwest Milwaukee. Mel flew his Astro Cobalt powered Leisure Playboy. Mel and Dick love the Cobalt 05 and have bought six of them. We estimated that the Playboy climbed to 1000' three times each charge (7-cell Sanyo 1.2 AH). The model glides very well and will turn on a dime without a significant loss of altitude.

I had sent Dick a plan for the Wasp, which he built. I was honored with the opportunity to make the maiden flight. Dick had installed an Astro XL05 with a 6-cell pack. After trimming the model out, we were able to roll and loop and fly inverted. This caught the attention of the gassie fliers who were convinced that electric

KRC's Heinz Koerner with scratch-built Lockheed Constellation. Powered by four Mabuchi 550's, 98" one piece wing with 76" fuselage. It was not completed for fun fly. Weight — approximately 10 lbs.

Teri Fenstermacher with Austin Gutman's Poterfield. Teri is wife of KRC Treasurer, Bruce. She ran refreshment stand.

Nelson Whitman releases Shag II on hi-start. Hydro needs assist on grass. Bob Kopski (not shown) has transmitter. Dan Mitten photo.

only worked for powered sailplanes.

Both Mel and Dick Thomas are dedicated modelers who enjoy flying and building a wide variety of R/C aircraft. They enjoy electric power because of the ease of installation, cleanliness, and noiseless flight, which allows for flying at local sites. They are interested in forming an all electric club in Milwaukee. If you live in the area and are interested, drop a line to Mel Thomas, 11202 West Florist Avenue, Milwaukee, Wisconsin 53225.

Steve Crow of Sylmar, California sent us photos of his latest project. The electric powered Hurricane was built with the structure somewhat like a rubber powered job to keep it light. The wing fillets are made of Bond paper, cowl was formed out of A.S.A. plastic, the canopy opens so air can flow through the nose, over the battery and vent through the cockpit. The whole ship was constructed from contest grade balsa. Steve patterned the Hurricane like the one he flew while he served with the R.A.F.

Hurricane specs: Span 60"; area 520 sq. inches; loading 20 oz./sq. ft.; weight 4.5 lbs.; prop 13/8; fuselage covered in silk; wing and tail, Super MonoKote; Cam. paint is polyurethane; commercial 3" spinner. Power — Astro 15 geared with two position throttle switch. Radio — Futaba 6 channel with four S-20 servos.

KRC Electric Fly
September 18 and 19

The Keystone Radio Control held the Third Annual KRC Electric Fly on September 18 and 19, 1982, at their club field on the grounds of their gracious benefactor: SPS Technologies.

Keith Shaw, a well-known flier of all sorts of models, drove from Ann Arbor, Michigan, to my home town near Toledo, Ohio, and we began our 10 hour journey east to Lansdale, Pennsylvania. Lansdale is just north of Philadelphia, and is the home town of Bob Kopski, the Electric Fly Chairman for 1982.

We were very impressed by the organization of the KRC Club, which is probably one of the few electric dominated clubs in the country. They had signs everywhere. If you got near Lansdale, you could find your way to the flying field. I swear I saw a sign "KRC Electric Fly 350 miles" at the Ohio, Pennsylvania Turnpike

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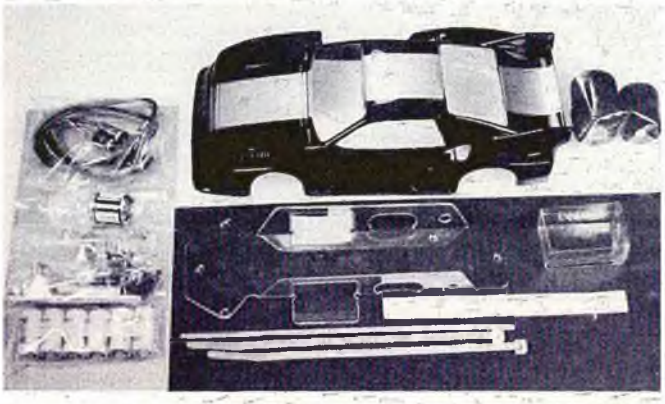
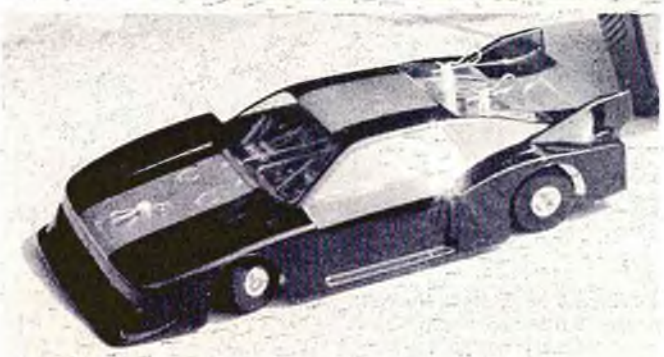
Sam Stitzer launching original "Daydreamer."

Charlie Hampton with several of his electrics. Note flightline battery.

RCM PRODUCT REVIEW

Parma International CHEETAH





SPECIFICATIONS

Name	PARMA CHEETAH
Car Type	1/8 Scale Race Car
Manufactured By	Parma International, Inc. 13927 Progress Parkway North Royalton, Ohio 44133
Mfg. Suggested Retail Price	$99.95
Available From	Both Mfg. & Retail
Length	9¾ Inches
Width	5⅛ Inches
Height	2½"
Power Plant	Parma Ferrari Elec.
Power Source:	Sanyo- Two 3-cell Sticks, 12V
Recommended No. of Channels	2
Basic Materials Used In Construction:	
Chassis	Clear Plastic Lexan
Body	Painted Lexan
Wheels & Tires	Turned Alloy Whls. Sponge Rubber Tires
Instruction Manual	Yes (8 Pages)
Construction Photos & Drawings	Yes

RCM PROTOTYPE

Motor Used	As supplied in kit
Radio Used	Cox 2 Channel
Gearing Used	8 Tooth Drive, 5:99-1

SUMMARY

WE LIKED THE:

Quality of the individual parts. Performance and appearance are very good.

WE DIDN'T LIKE THE:

Instructions and manual needs improvement.

Our review of the 1/18th Scale Parma Cheetah started with the attractive display shipping carton. The box measured 10½" long x 5½" wide, and was 2¾" high. A nice feature was the clear plastic "window" that covers most of one side, and allows a good view of what's inside.

Before we do go inside, however, let's take a look again at the outside of the box. True to its established practice, Parma gives the prospective customer a pretty good idea of what they are getting by listing the contents of the kit on one end of the box. Printed there were two kit numbers, 1403 and 1406. Alongside each number was a small box that could be "checked" to indicate which kit was inside. Ours was 1403, the "Complete Race Car Kit." Listed were the following: Lexan Moncoque chassis, torque tube motor mount, glued and trued tires and wheels, motor, batteries, resistor, reverse switch, and painted and trimmed Lexan body. Less radio system. Below that was the unchecked box for kit 1406, which indicated that it would have contained the complete assembled race car, which includes all parts in kit 1403 (the unassembled one). Well, we had 1403, the one that needs working on, and there was just one thing left to do . . . open the box and get started. Ah, but first we must tell you about the great exploded view drawing of the car (minus body) that covers most of the bottom of the box. Each part is shown in wonderful detail, and a part number printed alongside it. To the left of the drawing is a parts list with number and name of each part. Now, let's open it up and see what we have.

The beautifully painted body, black with gold trim, and the Lexan chassis, were the only "loose" items in the box. All other parts were bagged, and done in a very workmanlike way. What Parma did was to gather small parts, according to function, and place them in their own clear plastic bag. There were a total of five bags, and they contained mechanical parts, electrical parts, motor, batteries, charging cord, etc. Each bag was stapled to a 4¼" wide by 9½" long strip of cardboard. This packaging technique is excellent, we think, as it keeps component parts together in bags, and keeps the bags fastened down on the cardboard.

Also found in the box was an eight page instruction manual.

Construction:

No formal plans were included since this is, primarily, not so much a building type kit as it is one which needs to be assembled. The eight page manual measured 8½" high by 5½" wide which meant, of course, that it was two 8½" x 11" sheets folded in the middle and placed together to form our eight page booklet. The cover had two photos on it, the top one being a great overhead view of the completed car, minus body. We referred to this photo many times during assembly, and it was found to be a very good aid.

The lower photo was a 3/4 view of the completed car with two body styles shown. On the bottom of the cover page was a list of tools needed for assembly. They were: small Phillips screwdriver, small blade screwdriver, needle nose pliers, and soldering iron and solder. Later we found we also needed an X-Acto knife, small diagonals, and a small flat file. The listing of tools is a good idea that several kit manufacturers use, and one we wish more of them would do.

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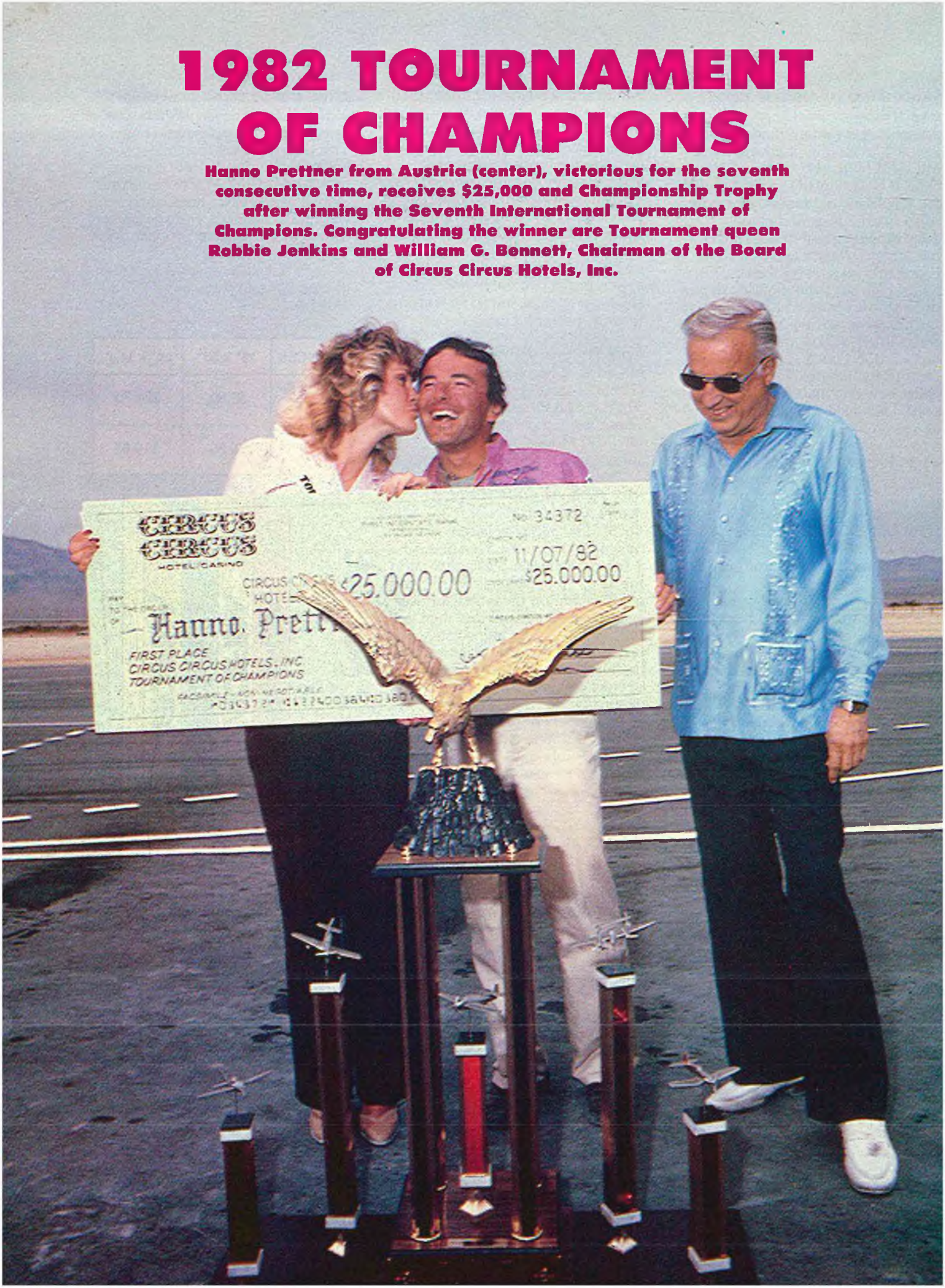
1982 TOURNAMENT OF CHAMPIONS

Hanno Prettner from Austria (center), victorious for the seventh consecutive time, receives $25,000 and Championship Trophy after winning the Seventh International Tournament of Champions. Congratulating the winner are Tournament queen Robbie Jenkins and William G. Bennett, Chairman of the Board of Circus Circus Hotels, Inc.



By Dick Tichenor

Wolfgang Matt receives second place trophy and check for $12,000.

Hanno Prettner of Austria won first place trophy and $25,000 in the Seventh International Tournament of Champions for radio control aerobatic aircraft. It was the current world champion's seventh consecutive victory in this event. Twenty top ranking pilots from eight nations competed in the $100,000 four day tournament, hosted by William G. Bennett, Chairman of the Board of Circus Circus Hotels, Inc.

Two-time world champion Wolfgang Matt of Liechtenstein placed second for $12,000. Dave Brown of Hamilton, Ohio, current U.S. Champion, captured third place and $9,000. Finishing fourth for

Dave Brown with his third place trophy and $9,000 check.

7th CIRCUS CIRCUS · LAS VEGAS · 1982 Tournament of Champions

WHAT THEY WERE FLYING

Pilot	Place	Points	Aircraft	Designer	Radio	Engine	Muffler	Prop	Retracts
Akiba, Y — Japan	17	8,310.6	Cap 20L		Futaba	Tartan Twin	Hattory	O.R.	O.R.
Bertolani, B. — Italy	18	8,181.8	Yak 18	B.B. Model Bertolani	JR	Tartan Twin		Zinger	B.B. Model Bertolani
Bonetti, T. — U.S.A.	15	8,577.8	Cap 21	Jeff Tracy	JR	Magnum III	Magnum III	Zinger 20/10	None
Brown, D. — U.S.A.	3	10,378.6	Laser 200	Wayne Ulery	World	Tartan Twin	Chapman	Max Dailey	None
Frackowiak, T. — U.S.A.	4	10,270.7	Laser 200	Wayne Ulery	World	2 O.S. .90 FSR	E.D. Pipes	Clark 24/10	None
Gilman, R. — U.S.A.	11	9,023	Chipmunk	Don's Custom Models	JR	Tartan Twin	Macs Special	Zinger Modified	None None
Helms, S. — U.S.A.	8	9,150.3	Laser 200	Wayne Ulery	JR	Magnum 3.5 cu	Magnum	Zinger 20/10	None
Hoppe, G. — W. Germany	9	9,140.4	Cap 21	Self	Webra	Webra Bully 35	E.D. Pipes	Carbon Fiber	None
Koger, D. — U.S.A.	12	8,987	Laser 200	Wayne Ulery	JR	Tartan Twin	Mac's	Max Dailey	None
Kristensen, I. — Canada	5	10,264.2	Laser 200	Wayne Ulery	Futaba	Webra Twin	Rossi Pipes	Max Dailey	None
Lowe, D. — U.S.A.	6	9,396.8	Laser 200	Wayne Ulery	JR	Tartan Twin	OPS Tuned Pipes	Max Dailey 20/10	None
Matt, W. — Liechtenstein	2	10,775.5	Topp Laser 200	Wayne Ulery	Webra	Webra Bully 35	Webra	Fiberglass Sandwich 20/10	AMT
Naruke, G. — Japan	16	8,511.7	Cap 20L	Wayne Ulery	Futaba	O.S. .90 Drive	Hattory	O.R.	O.R.
Prettner, H. — Austria	1	11,262.6	Dalotel	Self	Simprop	S.T. Twin 75	Super Tigre	Top Flite	Giezendanner/AMT
Radcliff, M. — U.S.A.	7	9,258	Laser 200	Wayne Ulery	Kraft/JR	Tartan Twin	Chapman	Max Dailey 21/9	None
Schweiker, W. — W. Germany	13	8,826.2	Cap 21	Gunter Hoppe	Graupner	Webra Bully 35	Resonanzrohr Eigenbau	Eigenbau 20/10	2 Bein Starr
Stricker, S. — U.S.A.	14	8,815.3	Super Chipmunk	Don's Custom Models	JR	Magnum	Bantam 2.6	24/6	None
Tracy, J. — Australia	20	4,794.5	Cap 21	Self/J. Reusch	Kraft/JR	Webra Twin	Phelan	Max Dailey	None
Weitz, D. — U.S.A.	10	9,054.9	Laser 200	Wayne Ulery	JR	Tartan Twin	Chapman	Max Dailey	None
Wilson, D. — U.S.A.	19	8,072.6	Chipmunk	Don's Custom Models	JR	Magnum III	Magnum III	Zinger	None

Tony Frackowiak captured fourth place and $6,000.

Ivan Kristensen took fifth place and $5,000.

The incomparable Hanno Prettner and father, Hans, on ready line observing Don Lowe's flight.

Wolfgang Matt with his Laser 200.

Dave Brown and Laser 200.

Tony Frackowiak and Laser 200.

Ivan Kristensen and Laser 200.

Don Lowe and Laser 200.

Mark Radcliff and Laser 200.

Gunter Hoppe with Cap 21.

$6,000 was Tony Frackowiak of Loveland, Ohio, and Ivan Kristensen of Guelph, Ontario, Canada, won $5,000 in fifth place. Each of the finalists received a massive, custom designed trophy.

The invincible Prettner, a 30 year old electrical engineer from Klagenfurt, Austria, has been described by his peers as, "The most gifted pilot in the history of aeromodeling." Three time world champion and winner of over 250 national and international competitions, he was remained undefeated in the Tournament of Champions since the inception of the event in 1974. For the last three contests, he has flown the Dalotel, a low wing monoplane of his own design.

Tournament of Champions pioneered the concept of simulating a full scale aerobatic competition, using aircraft which are semi-scale replicas of full size aerobatic planes. Contestants were required to fly Known Compulsory, Unknown Compulsory, and Free Style programs. Scoring and judging standards were identical to those applied to full scale aerobatic competitions.

Prettner grabbed the lead in the first round with a score of 4498.1,

Steve Helms flew a Laser 200. We lost photo.

ahead of Matt's 4227.3, Lowe's 4164.8, Frackowiak's 4123.3, and Kristensens

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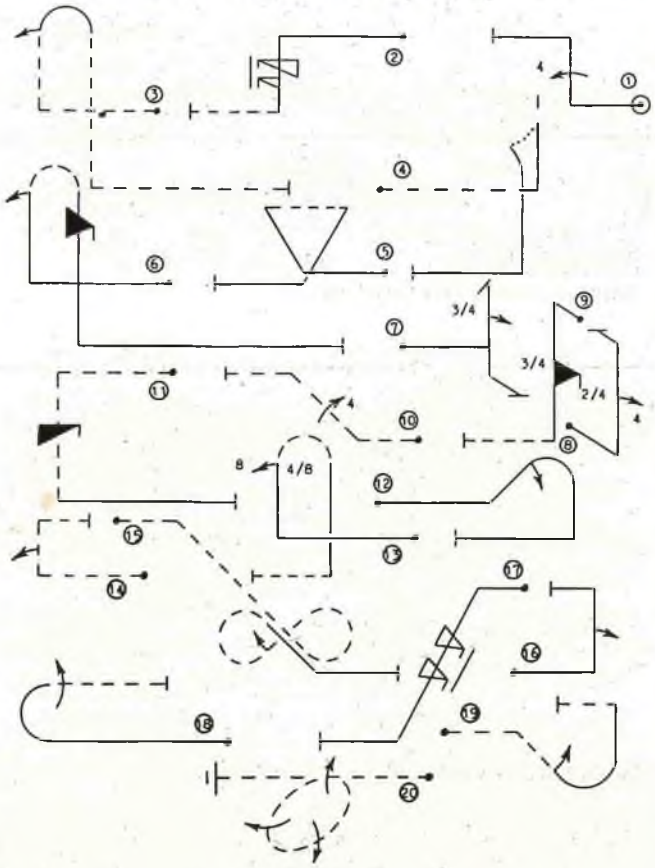
ARESTI SYMBOLS
KNOWN QUALIFICATIONS
COMPULSORY PROGRAM



Don Weitz and Laser 200.

Steve Stricker flew a Super Chipmunk.

Ron Gilman flew a Super Chipmunk.

Werner Schwiker with Cap 21.

Dean Koger and Laser 200.

Tony Bonetti with Cap 21.

Gilchi Naruke with Cap 20L.

Yoichiro Akiba with Cap 20L.

Benito Bertolani flew a Yak 18.

Dave Wilson flew a Super Chipmunk.

Jeff Tracy with Cap 21.

The Buck stops here, these men had the top responsibilities. Mel Larson, Circus Circus VP, Dr. James "Doc" Edwards, Chief Judge, and Phil Kraft, Contest Director.

Judges and celebrities. Kneeling (L to R): Wm. "Buck" Weaver, Clint McHenry, Dave Lane, Vera Goulet, Robert Goulet, Travis McGinnis, Steve Nelson. Standing (L to R): Geoff Franklin, "Doc" Edwards, LaMar Steen, Bob Upton, Gordon Price, Bill Payne, Gerry Zimmerman, Phil Kraft.

TOC Cofounder Walt Schroder (Right) In a jolly chat with Hanno Prettner.

Wolfgang Matt was accompanied by these family members.

We interrupted Mark Radcliff's check out.

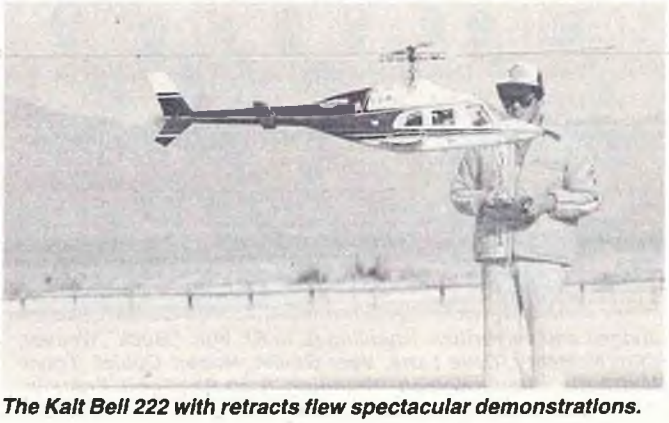
Each judge has an assistant. Fame and fortune rode on their decisions.

Don Chapman (left) shared his engine expertise with several of the contestants.

Jeff Tracy used a Webra Twin installation in his Cap 21.

Steve Stricker's Super Chipmunk, built from a Don's Custom Models kit.

Gunter Hoppe has TOC memories on film.



The Kalt Bell 222 with retracts flew spectacular demonstrations.

Somehow this Kalt Bell Jet Ranger out performed Mel Larson's full size Jet Ranger.

The stock Kalt Baron wowed the crowd with inverted antics.

Kraft, Weirick, Crawford, and Kidd were turned on by a Prettner flight.

Giichi Naruke firing up for a flight.

Just waiting to do their thing.

Dean Koger's Laser 200.

Yoichiro's Cap 20L.

Ron Gilman's Super Chipmunk.

Ivan Kristensen's Laser 200.

Dave Brown's Laser 200.

ASSEMBLY OF THE EAGLES

1982 Q.S.A.A. LAS VEGAS FLY-IN

By Dick Tichenor

The Sixth Annual QSAA Las Vegas Fly-In was the best one to date. Registration, displays, and the banquet were again held in the spacious facilities of the Showboat Hotel and Casino. The flight activity was moved back to Searchlight dry lake bed which is located approximately 35 miles southeast of Las Vegas.

The happiest aspect of the '82 Fly-In was probably the superb weather which ranged through the mid to upper 70's for the three days. As can be expected in western desert areas, one small squall passed through in the mid-afternoon on Saturday. This provided an excuse for a lot of the folks to go into town, get cleaned up, have a turn at the casinos, and then attend the banquet. There were, however, several modelers who continued to fly through

EVENT	WINNER	MODEL	TROPHY SPONSOR
Best of Show	George Harlan	Monocoupe 90-A	R/C Modeler Magazine
Best of Static	Bob Gillespie	Fairchild F-27	Sig Manufacturing
Best of Scale	Bill Strohman	Albatros #4	Kraft Systems
Best Finish	Dick Enos	Fly Baby	K & B Manufacturing
Best WWI	Brian Curry	Sopwith Pup	Carl Goldberg Models
Best Military Scale	Joe Zimmerman	P-39	Kraft Orange County
Best Civilian Scale	David New	Cessna 140	John & Donna LaComb
Best Stand-Off Scale	Chuck Fuller	AT-6	Model Airplane News
Best Biplane	Wesley Vosburg	Fly Baby Bipe	Coverite
Best Multi-Engine	Wolfgang Muller	Lockheed C-5A	Bridi Hobby Enterprises
Best Scratch-Built	Mel Barber	Sikorsky S-39 CS	Billy Root
Best Junior Entry	John Bashore	Super Chipmunk	Summa Corporation
Best Mech. Achievement	Jorg Vogelsang	V1 Manned Buzz Bomb	Larry Vance
Best Electric	Tony & Addie Naccarato	J-3 Cub	Astro Flight
Powder Puff Award	Pat Bunker	Mooney Mite	Budweiser-Michelob
Crap Shooter Event	Dick Smith	Pitts	Circus Circus
Marathon	Ed Hess	Mr. Mulligan	Du-Bro
Longest Distance	Mel Barber	Sikorsky S-39 CS	J & J Hobbies

Best of Show award. George and Carolyn Harlan with a super detailed Monocoupe 90A.

Best of Static award. Bob Gillespie with Fairchild F-27.

Best of Scale. Bill Strohman, Taube Albatros #4.

Best Finish. Dick Enos, Fly Baby.

Best WW I. Brian Curry, Sopwith Pup.

Best Military Scale. Joe Zimmerman, Bell P-39 Aircobra.

Best Civilian Scale. David New, Cessna 140.

Best Stand-off Scale. Chuck and Gloria Fuller, AT-6-D.

Best Bi-Plane. Wesley Vosburg, Fly Baby Bipe.

Best Multi Engine. Wolfgang Mueller, Lufthansa Modellflug, Lockheed C-5A.

Best Scratch Built. Mel Barber, Sikorsky S-39CS Spirit of Africa.

Best Junior Entry. John Bashore, Super Chipmunk.

the sprinkles and slight wind and flying continued until dark.

Assisted by Southern California Chapters 3 and 7, the Las Vegas QSAA Headquarters group conducted a well-organized, smooth running event. Transmitter impound, frequency control, ready line and flight line were efficiently handled with the PA announcer constantly advising of open frequencies. This was one major event where no one could go home complaining of not being able to fly as much as they desired.

Contrary to malicious rumors, the Quarter Scale Association of America (QSAA) is far from being dead. Its original, and present, concept is one of enjoying the larger scale aircraft with legislative, organizational and political aspects being held to an absolute minimum. The Las Vegas group plans and conducts their annual fly-in. Various chapters conduct whatever activities they desire based on the comaraderie derived from being involved with large aircraft models, enjoyment, without complications, is the goal.

Approximately 200 aircraft were at the flying site including those registered to fly and those brought out for display. Most interesting was the wide variety of model types — our photo coverage gives a sample of that variety. The degree of sophistication, detailing, and craftsmanship exhibited in the scale models is almost unbelievable.

One of the most pleasant facets of the Las Vegas Fly-In is the opportunity to see and visit with old friends. Former World and National R/C Champion Ralph Brooke was there with his lovely wife Jeannie. Lou Ross brought along a group of engines that he is producing for military projects. R/C pioneers Bob Dunham, Bill Deans, Ray Downs, Cliff Weirick, and Chuck Hayes, were among those we ran into. This reporter's biggest complaint is that trying to get photo coverage of this event just doesn't allow much time to visit with the fantastic people involved with R/C.

Speaking of fantastic people, our compliments are extended to the QSAA Las Vegas Headquarters Group for their dedicated efforts in planning and providing a great weekend of Big is Beautiful. □

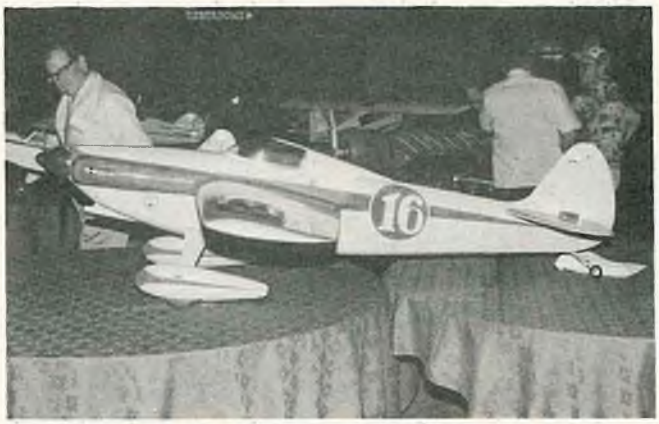
Best Mechanical Achievement. Jorg Vogelsang, V-1 Manned Buzz Bomb.

Best Electric Power. Addie Naccarto, J-3 Cub.

Powder Puff award. Pat Bunker, Mooney Mite.

Crap Shooter event. Dick Smith, Pitts Special.

Marathon event. Ed Hess, Mr. Mulligan.



Shoestring Formula I racer by Bob Seigelkoff.

Otto Schulze, West Germany, could drop either one large or two small R/C parachutists from this J-3 Cub.

A gorgeous Waco YKS-6 by Noal Hess, Rick Derry, pilot.

Brian Curry displayed his partially completed Long EZ.

Bud Pannier built this 104" wingspan P-47D.

Dick Enos' Lockheed Vega is a beauty.

Christian Tacket brought his Tartan Twin powered Rallye from France.

Lockheed Hudson I built by Ron Wiser, flown by Dick Clements.

DeH Tiger Moth built by Shorty Wright, Richard Wright, pilot.

Superb detailing in 1937 FW 56 Stosser by Allan Kass.

Mel Santmeyers' Piper Tomahawk was bulit from Don's Custom Models kit.

Forest Edwards' Fleet Trainer is powered by his famous 5 cyl. 4 stroke engine.

A neat Ryan STA built by Bob Cilk.

Cedric Galloway scratch-built this Travel Air Mystery Ship.

This is Walt Staff's Aeronca.

Col. Bob Thacker built this 1/4 Scale Quickie from RCM plans.

An excellent Corben Super Ace by Bob Oslan.

Dick Skoglund covered his Ercoupe with chrome MonoKote.

We think this is Ken Runestrand's Pober Pixie.

Tom Bunker's A6M5 Zero.

Gloria and Chuck Fuller built this Waco UMF-3.

Shorty Wright's Bucker Jungmeister was flown by Richard Wright.

James Stondall built this very nice Curtis Robin. Roger Grotheer, pilot.

Ford Trimotor built by Norman Johnson had corrugated skins.

Melvin Phillips' Piper Tri Pacer was a good flying machine.

Why did Maxey Hester, shown with his J-3 Cub, receive votes for the Powder Puff award?

Eldon Keele's Stearman leads the way to the flight line.

Don Martin's B-17G, Ken Meade, pilot.

Stinson Reliant built by Norman Johnson.

Ken Runestrand with his Piper L-4.

Here we have a part of the ready line.

Don Martin's B-17G moments before touchdown.

Mel Barber's Sikorsky S-39 in a fly-by.

Details of George Harlan's Best of Show Monocoupe 90A.

Front end of Bill Strohman's 1912 Albatros #4 type E-E Taube.

The brass temperature gauge is a nice touch to James Stondall's Curtiss Robin.

Bill Seitz's Pietenpol Air Camper.

Fly Baby cockpit details by Dick Enos.

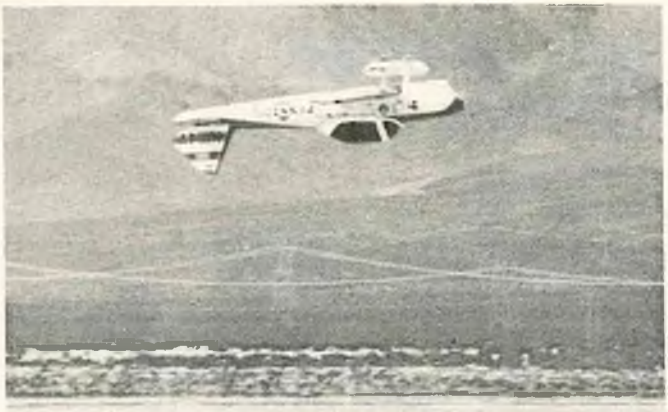
Pietenpol instrument panel.

The Kavan 4-Stroke Twin was demonstrated at the fly-in.

Lockheed C-5A details.

Harry Apolan's Morane Saulnier on take-off.

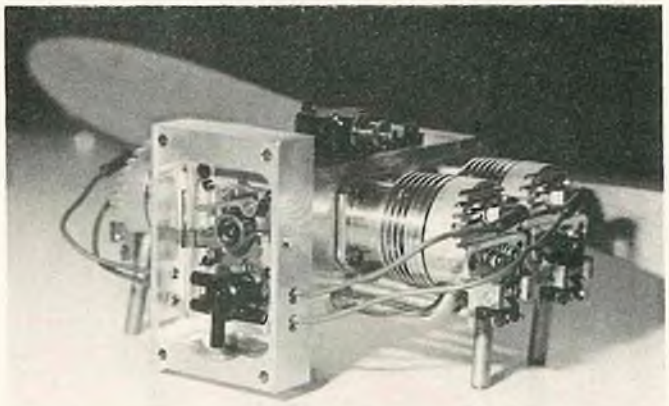
Lockheed C-5A landing.



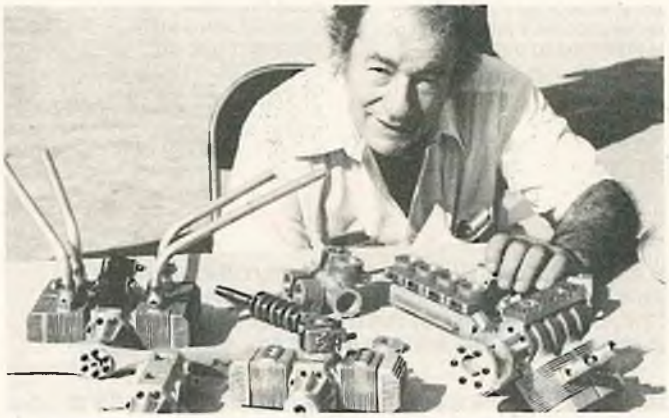
John Bashore does an exciting air show with his Chipmunk.

A take-off run by Roy Stephen's Fairchild 22.

Bill Wendt's Cessna Agwagon on a dusting run.



Kirk Lee showed us his flat 4 cylinder 4 stroke ignition engine.



Lou Ross displayed various engines that he is producing for RPV projects.

Ralph and Jeannie Brooke were selling Tony Clark kits.

R/C Parachutist dropped from Otto Schulze's J-3 Cub.

If this Pietenpol looks real, well it is.

A CLICK TOO RICH

By David Andersen

Charlie was excited when the UPS package arrived. It was a new radio control system — the newest and most sophisticated that money could buy. He opened the package and picked up the instruction manual. It was voluminous.

"Congratulations on becoming the owner of the world's first totally computerized telemetry control system for model airplanes," the book said. It went on to explain the installation and operating procedures for the battery, receiver, servos, microprocessor and sensors.

Charlie held the position sensor in his hand and examined it carefully. It contained a three-axis strain gauge and a multiplexing "analog to digital" converter. The strain gauge measured acceleration in roll, pitch, and yaw; and the microprocessor computed the double integral and coordinate translation to estimate position and attitude. This unit had to be mounted exactly at the plane's Center of Gravity and acccurately leveled with respect to the wings and thrust line, the instruction manual said.

Next, Charlie picked up the acoustic transducer. This device contained an ultrasonic range finder similar to the automatic range finder in a Polaroid camera. It was to be mounted beneath the fuselage, pointing straight down. It could measure altitude to an accuracy of 6" but its range was limited to about 30'. It was to be used by the microprocessor to control flare during landings. The transducer also measured airframe vibration to estimate engine speed.

The airborne transmitter module was built into the receiver. It time-shared the antenna with the receiver, transmitting position and attitude data to the ground every ten miliseconds.

But the most unusual looking component of the new system was the transmitter. It had the usual sticks and thumb levers but it also had a keyboard and two antennas. Deep inside the vinyl covered box were several more microprocessors.

"Looks more like a computer terminal than an R/C transmitter," mumbled Charlie to himself. The keyboard had all the letters of the alphabet plus the ten digits inscribed on a plastic touch panel mounted between the two control sticks. Above the keyboard were some special control keys that were lettered **"Execute," "Manual," "Semi-auto,"** and **"Automatic."** Below the keyboard was an audio speaker.

Charlie flicked the power switch to **"On."**

"Warning!" said the speaker. "RF power is on — 72.960 Mega-hertz." The voice was a bit monotone, lacking the inflection of voice response equipment that Charlie was used to hearing.

Two collapsible antennas of slightly different lengths projected from the top of the transmitter. The shorter antenna was a receiving antenna which received the position data being transmitted from the plane.

Charlie quickly installed the equipment in his Dirty Birdy. He set up the plane on a table and leveled the fuselage and wings with a carpenter's bubble level. Then he attached the position sensor to a bulkhead above the wing at the Center of Gravity, carefully installing it with the carpenter's level so that the top of the unit was exactly level. Then he cut a 1" hole in the bottom of the fuselage

aft of the wing where he installed the acoustic transducer. The battery, servos, and receiver were quickly installed in the same positions as his old radio gear. The microprocessor unit was wrapped in the same foam rubber as the receiver and wedged behind the firewall under the fuel tank.

How would the microprocessor know when the plane was running low on fuel? Charlie consulted the big instruction book again and he learned that the engine must be started with a full tank. Then the microprocessor would integrate engine rpm overtime to estimate fuel on board. The book claimed the estimate to be accurate to within 20%. A spoken warning would occur on the transmitter's speaker when the fuel on board was 25% of the capacity of the tank.

Charlie spent the next few days in his shop. He didn't build anything. Instead, he studied the operating instructions for the new radio equipment. He studied the keyboard control commands. He follwed the logic of the flowcharts of the operating system. He examined the software listings. He read the specs for the LSI integrated circuits. All of the chips were CMOS to save battery power, and only a single 5 volt power source was needed. The 9.6 volt battery was dual-redundant.

By Saturday afternoon Charlie had committed all of the operating mnemonics to memory. He was ready to fly.

It was the transmitter that drew the most attention for the other fliers at the field that Saturday. People asked about the two antennas and the strange keyboard. It was just too much to explain to everyone so Charlie said, "Leave me alone for a while, I'll tell you how it works later."

He fueld the plane and turned on the receiver. After clipping the frequency pin to one of the antennas he turned on the transmitter.

"I know — I know," he said as the mechanical voice told him what he had just done.

He programmed the transmitter with his flight parameters — "Fuel tank size?" asked the box. Charlie typed "14" on the keyboard.

"Percent nitro?", asked the box. Charlie pushed "5" on the keyboard.

"Weight in ounces?" asked the box once again. Charlie entered "122" on the keyboard.

"Pattern?" inquired the box. Charlie typed **"advanced"** on the keyboard.

"Have a good flight," replied the computer-transmitter.

Charlie pushed the buttom marked **"Manual."** He started the engine and taxied out to the center of the runway. After wiping his hands on his pants and checking the wind direction he advanced the throttle and the plane took off. He flew the plane in manual mode for a while to test the trim and to get a feel for the controls. After awhile he pushed the button marked **"Semi-Auto."** Nothing much happened except Charlie noticed that the plane immediately resumed straight and level flight whenever he took his thumbs off of the sticks.

He turned the plane toward the center of the field and he typed the code for stall turn — "ST" — on the keyboard. He flew the plane down the center of the runway. When the plane was at its closest he pushed the button marked **"Execute"** and he took his thumbs off the sticks.

The engine roared to full power, the elevator stick pulled back and the plane climbed straight up. Then the throttle returned to idle as the rudder stick moved to full left. The plane rotated in place until its nose pointed straight down. It fell with a slight wiggle of the tail. Charlie held his thumbs off the sticks but very close to them as the plane descended. The plane recovered and resumed level flight at exactly the same altitude but opposite heading as the entry into the maneuver.

Once again Charlie placed his thumbs back on the sticks to resume manual control of the plane. He flew the plane into position for another maneuver. He typed "3IL" on the keyboard and he pushed **Execute.** The plane executed three identical inside loops exactly superimposed in space. Charlie was delighted. The plane had never flown this well before.

"I didn't know I was such a good pilot," remarked Charlie. He flew many more maneuvers, some manually, some automatically. The automatic maneuvers were always better.

"Fuel low — time to land," the voice from the transmitter said.

Charlie flew a pattern approach and a well-flared landing. He taxied back to the pit and shut off the engine.

"Carb's a click too rich," the electronic voice said as the propellor stopped turning.

Charlie refueled the plane and started the engine. He placed the plane on the runway and screwed the needle valve in one click. He taxied the plane to the center of the runway where the elegant pattern plane stopped. The propeller flashed in the sun as the engine barely ticked over.

"Now we'll see what it **really** can do," said Charlie as he typed **"Pattern"** on the keyboard, and he pushed **Execute.**

"Take-off starting now," the voice said.

The engine speed increased and the plane began to roll. Faster and faster it went and gradually lifted into the air as it passed Charlie who was standing on the edge of the runway.

"Take-off complete," the voice said as Charlie held the transmitter in one hand, not touching the sticks.

The plane flew around the field and approached the point of take-off.

"Double stall turn," the voice said, "starting now."

The sleek pattern ship shot upward into a perfect double stall turn. Then came the Cuban 8 downwind followed by the double Immelman and a four-point roll. All were done with perfect positioning and form. Charlie timed the slow roll with his stopwatch. It took exactly five seconds.

Following the three-turn spin the plane approached the field, landed, and slowly taxied back to the exact spot where Charlie had placed it before take-off.

"Flight complete," the transmitter said, "--- Needs two turns of up elevator."

Charlie didn't fly any more that day — he was too overwhelmed by the power of his new radio equipment. He needed time to think about what he had experienced, and he needed to think about where his hobby was leading him.

The next week he received a program memory chip from the manufacturer. A note said that the chip contained software improvements that would improve Master's Pattern maneuvers in strong crosswinds. The note recommended that the integrated circuit chip be installed in the transmitter in exchange for the one already there. Accompanying the memory chip was a notice of a new feature available for Charlie's system. It was a device that measured barometric pressure, humidity, and air temperature. It could be attached to the carburetor of his plane, where it would adjust the needle valve and the idle jet to optimize engine performance in flight.

Soon there won't be anything left for **me** to do, thought Charlie.

Charlie thought about the summer when he learned to fly. That was twenty years ago! He remembered his first airplane. It was a single channel Champ with an escapement rubberband to wind. Push the button on the transmitter to turn right, push it again to turn left. Two quick pushes for a second left turn. What a thrill it was to control that plane in flight! What a feeling of accomplishment to land the plane in front of himself! What satisfaction! What pride he felt in himself!

He wished he could re-live those moments for they were gone forever.□

GIVE IT A WHIRL

John Gorham

First I must correct a couple of errors in our "Nationals" report. We showed a photo of Bob Conway receiving the Novice Class 1st prize. First place Novice was won by George Thiret (and our second error was spelling Thiret as Thret. Sorry George!).

You may remember a while ago, I think it was in the February issue of RCM, we included a letter from Pat Hall who had learned to fly the "Hughes 300C" and regarded his model flying as a definite help. Since then we've had several letters confirming the same opinion but the following one was so interesting, being from England and also from a pilot of one of the very early helicopters, that I felt it was worth sharing with you.

The Sikorsky XR4 on floats.

Dear Mr. Gorham,

I was very interested in the letter from Pat Hall describing his experiences at flying a full size helicopter after flying radio controlled helicopters.

For the last five years my interest has been R/C helicopters but, perhaps, to get it in perspective, I should tell you that I went solo on the Sikorsky R4 helicopter at the end of the 39/45 war. I flew solo in seven hours which is admittedly unashamed boasting. In those days there was no mechanical linkage between the throttle and the tail rotor, still less any control on engine speed. One flew with one eye looking out of the aircraft and the other on the engine rpm in order to ensure that the engine did not over-speed. It is also true that less than half of the pilots sent to acquire helicopter proficiency succeeded.

The interesting thing was that only pilots with extremely good coordination succeeded and then only when the movement of their feet and hands became a totally unconscious reaction to events.

Fifteen years ago I started building and flying R/C fixed wing but when R/C helicopters arrived I could not resist having a go. It took me much longer to master the R/C helicopter than the R/C fixed wing and so I think that the full scale experience that I had had so long ago was repeated. In other words, one has to be a better than average R/C pilot to master the R/C helicopter.

There used to be a saying that one could only fly the R4 if one was able to pat one's head with the left hand; simultaneously stroke one's stomach in a circular fashion with the right hand; and at the same time do a tap dance to a totally different rhythm. The problem was even further accentuated on the R4 because it was so underpowered that there was very little latitude for mistakes.

Yours,
L.S. Wigdor
Chislehurst, Kent, England

I would like to comment on Mr. Wigdor's letter, not because it isn't a realistic assessment of the situation as it was then, but just in case reading it deters modelers intending to take up flying R/C helicopters today. I completely agree with Mr. Wigdor that many R/C helicopter models of even five years ago required a considerable amount of coordination and one had to be a better than average R/C pilot to master them. The modern R/C helicopter, however, has improved considerably and is now being flown by a very wide cross section of the population, as we have discussed in recent columns. Not that there isn't a need for a good eye-to-hand coordination in any person who is thinking of entering the R/C model helicopter field. There certainly is. Reasonably fast response time and good coordination between eye and hand is needed but no greater than is needed to play a good game of tennis, golf or baseball (is that the right name for rounders?). A more important need, perhaps, in learning to fly an R/C helicopter is perserverance, because like every other task that needs repetitious attempts, that quality of perserverance is needed in order to keep going when progress seems to be small, zero, or even backwards. Take it from me, though, and many other helicopter fliers, all of a sudden it will "click" and from then on progress is very fast. This is, by the way, also true of the full size helicopter in which it seems to take around 5 hours to find the "hover button." So flying a modern model helicopter is maybe not so difficult as described in Mr. Widgor's letter but it certainly does require coordination and doggedness in order to keep up the practice until that "hover button" is found. More about beginners' problems later.

Clubs, Events, and Meetings

I have received many nice letters recently about club contests and events and I wish it would be possible to include them all in this column. This doesn't mean that I don't read them with a lot of interest and include many of their ideas in the column. The report which follows is sent from Canada by Dave Westbury who is treasurer and editor of "The Toronto R/C Helicopter Association." This association has just acquired a new home (flying field) which is situated in a field behind the Scarboro Cable TV Studios on Progress Avenue in Toronto. So here's another helicopter club which has its own field. How

Pit area and crowd at the Tri Valley opening day.

The heli pits waiting their turn to fly.

The gas powered car pits at the Tri Valley show.

Don't do it!

One of the Ultralites lands.

Okay, how about four R/C heli's complete with radios?

many more of you are making that progress? Please let me know.

Well, Dave Westbury sent me a report of "The Fifth Annual London Rally" held recently in Toronto, but I'll let him describe it to you:

Dear John,

For some time now, I have been thinking that it would be a good idea to send our club newsletter to you, just to let you know that helicopters are alive and well here in Canada. This month I have finally put words to action!

The "Toronto R/C Helicopter Association" was formed in November of 1978 and one month later became a Charter member of M.A.A.C. (The Model Aeronautics Association of Canada). Our membership grew to a high of 40 in 1980, and has now settled at about 30 regulars.

The club is very well-known in the Toronto area and we are invited quite regularly to put on demonstrations for community events. For the last 3 years the club has also been invited to promote the sport of R/C helicopters . . .

At any rate, John, that's enough background. Again, I just wanted to let you know that R/C helicopters are alive and well here in Canada!

The 1982 London Rally was held September 18th and 19th and our club was well-represented. The weather did not cooperate at all. It was so windy on Saturday, that rally organizer, Walter Knaus, postponed the Novice events until Sunday in hopes of better weather. As it turned out, this was a wise decision.

Saturday was spent trimming machines (for those hardy fliers who dared to challenge the wind), trading tall tales, renewing old friendships and watching flight demonstrations by Jean-Luc Bolduc, Don Dow and Rene Dikkes. If you weren't there you won't believe the stories about what Jean-Luc can do with a "chopper!"

Saturday ended with Walter Knaus hosting a party at a local motel for all the contestants and their friends. We stuffed ourselves from a delicious cold buffet, washed down the cold cuts with assorted liquid refreshments while viewing video tapes of the day's activities. Finally, we closed off the day by cutting (and eating) a huge cake to celebrate the "Fifth Annual Canadian R/C Helicopter Rally."

Sunday's weather started out beautifully with clear skies and a light breeze rather than a wind. This good fortune held until the Novice events were over and then it clouded over and

the wind returned just in time for the main event of the meet, the Schluter Cup. (The Pros were not impressed.)

The contestants in the Novice event were required to knock over 3 plastic bottles that were set out on three separate heli-pads. The time limit was set at two minutes, and points were scored for knocking over as many bottles as possible in the time limit.

Two rounds were flown. This was an excellent chance for the Novices to safely use their hovering abilities in a contest. The results of the Novice event were as follows: 1st, Joe Badjkor; 2nd, Bridgitta Schuster; 3rd, Mike Sturman.

The Schluter Cup consisted of three events, each with a time limit of two minutes. The first event was "the rescue of flood victims from a roof top." This required the pilot to stand 30' from the "roof top," hover out and lift the "victim" (a plastic pylon) off the roof with his skids. This proved to be a real challenge with the gusty winds not helping at all. The second event required the pilot to hover out 30' and try to knock the pylon off a 2' high platform, then hover back while his co-pilot set up another pylon. This was repeated as many times as possible within the 2 minute time limit. The final event was a test of the pilot's ability to do precision spot landings. Three heli-pads were placed in triangular fashion in front of the pilot, who then had to hover out and land in the middle of each heli-pad in turn, to score points. After successfully completing the circuit, the pilot returned to the starting pad and then began again, to complete as many circuits as possible within the two minute time limit.

Here are the results of the Schluter Cup competition for 1982: 1st, Jean-Luc Bolduc; 2nd, Rene Dikkes; 3rd, Don Dow.

All in all, it was a really great time, just as promised.

Dave Westbury
Canada

Thanks, Dave, for your interesting report and keep 'em coming, fellows.

★

Before launching off into this month's technical section, I must say a few words about a California model flying club's "Open Day" which I attended last Sunday. The reason that I wish to mention it is because I do not remember ever before attending a meet so well-organized and so obviously well-enjoyed by the crowd. The "Open Day" was held by the Tri Valley Flyers of "mid" California. Their model flying field is situated in Santa Maria. This event has been held for several years now and I have been invited to give helicopter flying demonstrations each time. Each time I've enjoyed it and each time the show has gotten better and better, but this year the organizers really excelled themselves.

As you can see from some of the photos, there was a very large crowd of people (surprising in an area which is not regarded as "over populated"). The most significant feature about the meet was the pace and variety of the events. Right from the word "go" at 9 a.m. the show opened with the playing of the National Anthem and an R/C 1/4 Scale J3 Cub appeared, towing a red, white and blue banner welcoming the people to the meet. Immediately after that, very tightly scheduled flying demonstrations commenced and this continued all day long. There was everything that you could imagine model aircraft could do, all beautifully performed and of such a short duration that the crowd never had a chance to get bored. Gliders, giant scale, sports pattern, combat pattern and them some. Picture, if you will also, a giant barbecue going on all day long behind the crowd, a large group of model car enthusiasts who showed us what they could do on the runway (3 times in the day) and our own model helicopter demonstrations. We tried to include variety and brevity in our flight demonstrations so we flew a small sports heli, a scale machine and a "contest" machine. During our last performance we placed a card table on the runway from which to fly our helicopters. During one of Robert's demos he tried to scare the " " off me by pretending to land his "Competitor" inverted on the card table. This caused loud oohs and aahs from the crowd, especially when I raced out to tell him "no, no, please don't." From an R/C helicopter flier's viewpoint, it was very pleasing to feel a part of the overall modeling fraternity instead of the "freaks" who keep breaking blades over at the farthest end of the field — or even banned to the parking lot.

Other features of the show which were all part of the ingredients which resulted in this very attractive model show were a full size gyrocopter which amazed the crowd with the daring of the pilot, and a couple of ultralights which flew in, landed and stayed for a while to let the crowd see them. You'll see a picture of yours truly trying hard to barter R/C helicopters for an ultralight. Didn't succeed, I'm afraid, but I'd sure like to try one someday. Add background music and a terrific commentary to all of the above and you get some idea how great this meet was.

Anyway, I write this meet up especially because I believe it is the type of activity which we must put on to interest people generally in our hobby. I can't remember when I've enjoyed a day more and, despite the fact it meant a 160 mile drive each way with no reward other than the fun of doing it, I must say I'm sure I'll be up there again next year. So thanks a lot, "Tri Valley Flyers" and all the club members who have put such a large amount of work into organizing such an enjoyable and successful meet. See you next year?

Now there are so many topics I would like to cover in this column and it seems that time usually runs out in preparation for them. I do promise, though, to cover them in the near future. These include the comparison between the full size and model helicopter rotor systems, a report on the latest R/C helicopter radios and discussion on the new gyros which are available which seem to be helping the beginner so much. I had an idea, however, for this column a couple of weeks ago when I was setting up a helicopter for a friend who had just finished building it. The problems that I encountered must be similar to those which many of you are experiencing and maybe what I did to "fix" them will help you, too.

The helicopter was reasonably well-built but I decided to have a thorough look at it before taking it outside to give it its first hover. The builder, by the way, was a modeler with reasonably good technical knowledge and intelligence but one who had done little modeling before attempting this R/C helicopter. Whether this was the reason or not, it was immediately apparent that the builder had not paid too much attention to the setting up instructions which come with every model helicopter kit nor the hints/tips which we have written about so many times in this column.

The first rule of setting up to fly is "do make sure that your fingers and thumbs are connected as closely as possible to the control surfaces of the helicopter." When I looked at this model I found that if I moved the cyclic pitch stick sideways or fore and aft as much as 3/32", the flybar paddles of the helicopter hardly moved at all. This was for several reasons.

(1) Servo motors had not been tightened down well on their rubber grommets so they were able to move in reaction to the output arm movement, thereby decreasing the **amount** of motion going to the control surfaces and also creating a "dead space" of control.

(2) The clevises which had been used at the control levers connected to the swashplate were old ones which were well-worn and so there was some "slop" where the pin entered the hole

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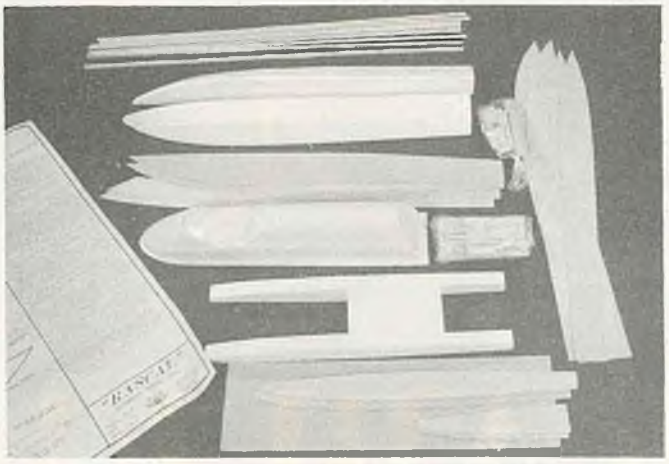
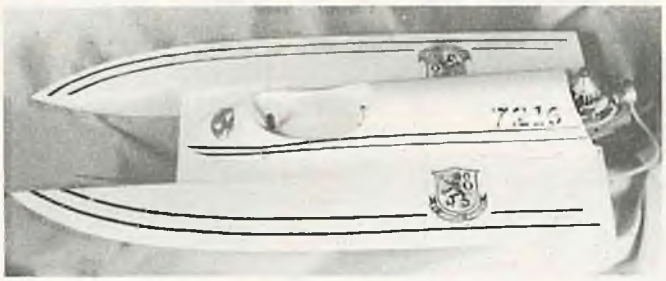
RCM PRODUCT REVIEW

Glen Spickler Radiomodels RASCAL





SPECIFICATIONS

Name	RASCAL
Aircraft Type	Outboard Tunnel Hull
Manufactured By	Glen Spickler Radiomodels 1709 Benton Bakersfield, California 93304
Mfg. Suggested Retail Price	$59.00
Available From	Both Mfg. & Retail Outlets
Beam	13 Inches
Hull Length	29¼
Mfg. Rec. Engine Range	.21 K & B Outboard
Recommended Fuel Tank Size	6 Oz.
Recommended No. of Channels	2
Rec. Control Functions	Rud., Throt.
Basic Materials Used In Construction	Foam, Balsa, Ply
Building Instructions on Plan Sheets	Yes
Instruction Manual	No
Construction Photos	No

RCM PROTOTYPE

Radio Used	Futaba 2- Stick, 2 Ch., FP-2E
Engine Make & Displacement	K & B .21 Outboard, (mod.)
Tank Size Used	Pylon 6 oz.
Weight:	4 Lb. 10 Oz. less fuel

SUMMARY

WE LIKED THE:
Well marked parts. Quality of plywood, balsa parts, and cowl. Looks and performance.

WE DIDN'T LIKE THE:
Small radio box. No running instructions. Incorrect instructions.

Glen Spickler Radiomodels of Bakersfield, California, has long been producing the Quickie series of R/C planes and has branched out into R/C boating with his Rascal tunnel hull kit. The kit is plywood over foam with an excellently molded plastic cowl. All parts for the basic boat are included and very well marked. It is available from retail outlets and the manufacturer.

When the 36" x 9" x 4½" box was opened, the cowl was surrounded by the foam sponsons and the foam hull. The large wood pieces and the instruction sheet were on the bottom. There were three plastic bags, one each of hardware and screws, small balsa parts, and small plywood parts. We were concerned with some dents in the foam pieces but discovered they were of no consequence.

The 28" x 40" single instruction sheet has a top and side view in full scale with every part identified. There are four smaller sketches and three marked angles for cutting the sponson balsa strips. The instructions are clearly written and easy to follow.

Construction:

First, the sponsons are built by epoxying 1/4" square balsa into preformed notches on each corner of the sponsons. The instructions say not to use 5-minute epoxy, but if you work rapidly enough you will have no problems with 5-minute epoxy. After the first balsa corner is epoxied into place, cut angles on the ends of the other pieces using the angle guide on the plans. The other balsa corners are epoxied into place one at a time. After curing, the balsa is sanded flush with the foam. The 1/8" plywood turn fin mount is fitted and epoxied in place. The 1/8" balsa sponson rears are epoxied into place and shaped and you are ready to cover the sponsons with 1/32" plywood.

The instructions call for taping over the outer 1/2" of each sponson side and plywood side with masking tape and covering the remainder with foam compatible contact cement. The tape is removed and epoxy applied where the tape was removed. The ply pieces are then applied to the sponsons and taped into place to cure. We hadn't used this method before but we used it here and it worked well. 5-minute epoxy over both surfaces would work as well and is somewhat faster.

The hull center section is built in much the same manner. The hull sides, radio box, and transom well are all covered by epoxying balsa to these surfaces. Cut the laminated transom well bottom to accommodate your engine. If you are using a K & B 3.5 outboard, the bottom must be cut from the rear corner of the transom opening to approximately 3/8" from the transom in a "V" shape. This will allow adequate engine turning.

Epoxy on the 1/32" ply deck and, after curing, cut out the engine well and radio box openings. The next step is to epoxy on the 1/32" ply bottom, but before that, coat all exposed wood parts under the deck with epoxy. Epoxy the hull bottom on and, after curing, coat the hull bottom inside the radio compartment with epoxy. Trial fit the radio box parts, coat all surfaces with a thin coat of epoxy and install the radio box parts into the hull.

The cowl is cut and adjusted according to the instructions and, with care, will fit very well.

Radio:

Next the radio equipment is installed. We used a Futaba FP-2F with FP-S7 servos. We installed the radio box rails

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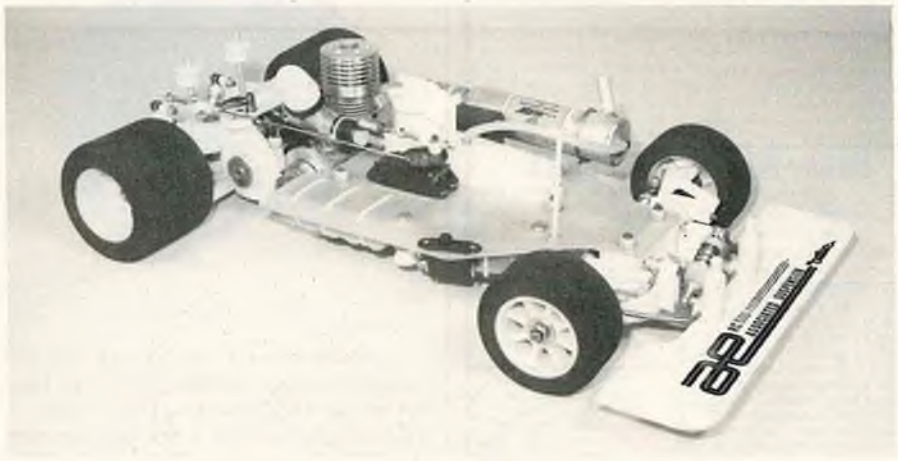
PIT STOP

Gene Husting



Tuning Tips On Associated's RC500 Car

There can't be any question in anyone's mind now, that the 4 wheel independent suspension or IS cars are here to stay. A year or two ago, most of the racers running the flat pan cars thought the first AMPS IS cars looked intriguing going around the track. But they weren't convinced the AMPS IS cars could beat the flat pan cars. With some foresight at the time, ROAR passed a new rule adding a Flat Pan Class, along with the Open Class to its rules. This would prevent the flat pan cars from becoming obsolete overnight. That was certainly a wise decision, because about 90% of the races are now being won by the IS cars. The lone exceptions are to a few super drivers like Ralphie Burch Jr. or Re-Pete Fusco, who have been tough to beat with their flat pan cars, but next year they'll also be racing IS cars.

Some racers are concerned that there are so many parts in the new IS cars, that the kits would be too complicated for them to put together. Associated realized their concern and made an instruction booklet with over 100 photos to make assembling the RC500 car an easy step by step experience. Each part is shown in a photo, exactly where and how it's installed. Included also is a comprehensive step by step written booklet explaining the easiest assembly methods. The booklet also contains chassis tuning, engine tuning and driving tips. After assembling the car, all the mysteries are gone, and you have the feeling you're an automotive design/engineer. You'll amaze yourself.

Some racers are concerned that all the added parts in an IS car could cause reliability problems, but this has been proven otherwise. Delta's Eagle IS car has competed in and successfully completed the 24 Hour of Miami Enduro race. A Rick Davis built RC500 IS car won the Detroit 6 Hour Enduro and a Rich Lee built RC500 IS car won the Del Mar 6 Hour Enduro. An Enduro race will test any car's reliability and these cars have certainly passed the reliability tests.

How about handling, you ask? Well, the RC500 placed 1st and 2nd at the Nationals in Boston, while the Eagle placed 1st at the Nationals in Indy, with RC500's taking 2nd and 3rd. Here, in Southern California, the RC500's hold all the track records. In Florida, Kim Davis and Chuck Moon are shattering track records with their RC500's. In the Texas-Oklahoma area, Joe Sullivan was a very good Expert Class driver, but since racing the RC500 Joe has taken over 2nd place behind Ralphie Burch Jr., and in the Northern California area, Gary Buriani is destroying the competition while leading the series with his RC500. Jr. Pascual in Hawaii and Dan Rutherford in Washington are reporting similar success stories as well as others around the country with their Eagles. The IS cars are definitely here to stay.

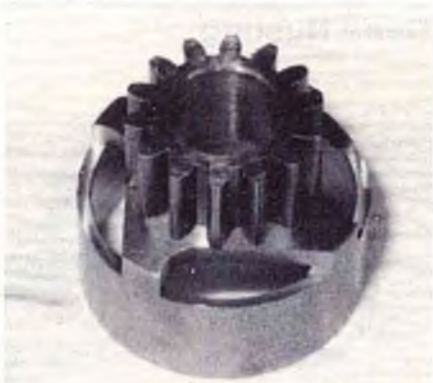
Associated's new Custom Racing shocks are now ready. These shocks are totally different from any other available shocks. We'll have a complete "How To" article next month on assembling, servicing, springs, oils, seals, etc. For those of you who can't wait, ask for part #5136 at your dealers. The pointer in the photo is showing the easy spring adjustment nut, to set the chassis "Tweak."

A new lightweight ball differential kit is now available for the RC500. The #5373 kit at $25.00 includes a plastic bearing spacer, a lightweight LH Axle Driver, a lightweight RH Axle Driver and a second plastic bearing spacer, with complete instructions in the kit. Two ball bearings are also required, such as Associateds #5375-pair $20.00, or two large motor bearings similar to the K & B 3.5, OPS or Picco bearings. These are not included in the kit.

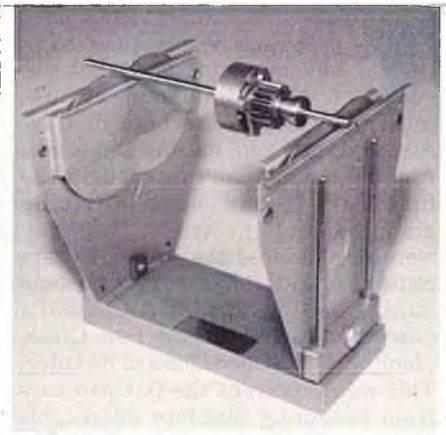
The LH Axle Driver can be further lightened by grinding away the un-needed portion of the mounting flange as shown in the RH part. Be sure the diff adjusting screw hole is located as shown here.

The new lightweight diff parts, on the left, including bearings, are shown

with the stock kit parts on the right. You can see the difference in size which will reduce the differential weight by 1/3.



Associated now has a new set of custom racing clutch bells for the RC500 and RC300 cars. The #5222 — 15 tooth and #5223 — 16 tooth are for the RC500, and the #2668 — 11 tooth and #2669 — 12 tooth are for the RC300 and all sell for $9.00



Rick Davis deserves a big thank you for telling us about this balancer, as well as 1,000 other things. This balancer is made by High Point Products, 3013 Mary Kay Lane, Glenview, Illinois 60025. Shown on the balancer is a clutch bell, with the ball bearings installed. The clutch bell will rotate so the heavy side falls to the bottom. By grinding away part of the bell on the heavy side near the vent, the clutch bell can be perfectly statically balanced. We are turning these clutch bells over 30,000 rpm, so it is most important that they be perfectly balanced for long ball bearing life. Rick balanced the clutch used on the RC300 car that set the 24 Hour Enduro record. The same clutch bell, shoes and bearings were used for a straight 24 hours. It's this type of meticulous work by Rick that enables these types of records to be set.

Another item that should be balanced is the front tires. This can be done

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PIT STOP

from page 96/95

quite easily on the car. Simply raise the chassis off the table by placing a block under it, high enough so the front wheels can rotate freely. The heavy part of the wheel will settle to the bottom. Using 3/4" long finishing nails, with no heads, take pliers and push a nail into the tire, next to the wheel, at top, as shown. Check for balance again. Install as many nails as necessary to balance.

Although this is covered in the instructions, some racers are in too big of a hurry to get their cars running and are too quick to overlook seemingly unimportant details. But it's all the details, both large and small, that make one car handle better than another. The pointer is pointing to the lower "A" arm which must be cut away slightly with an X-Acto knife to make sure there is clearance for the shock. Also, be very careful not to overtighten the screws mounting the shocks, otherwise you will put them in a bind, affecting the suspension.

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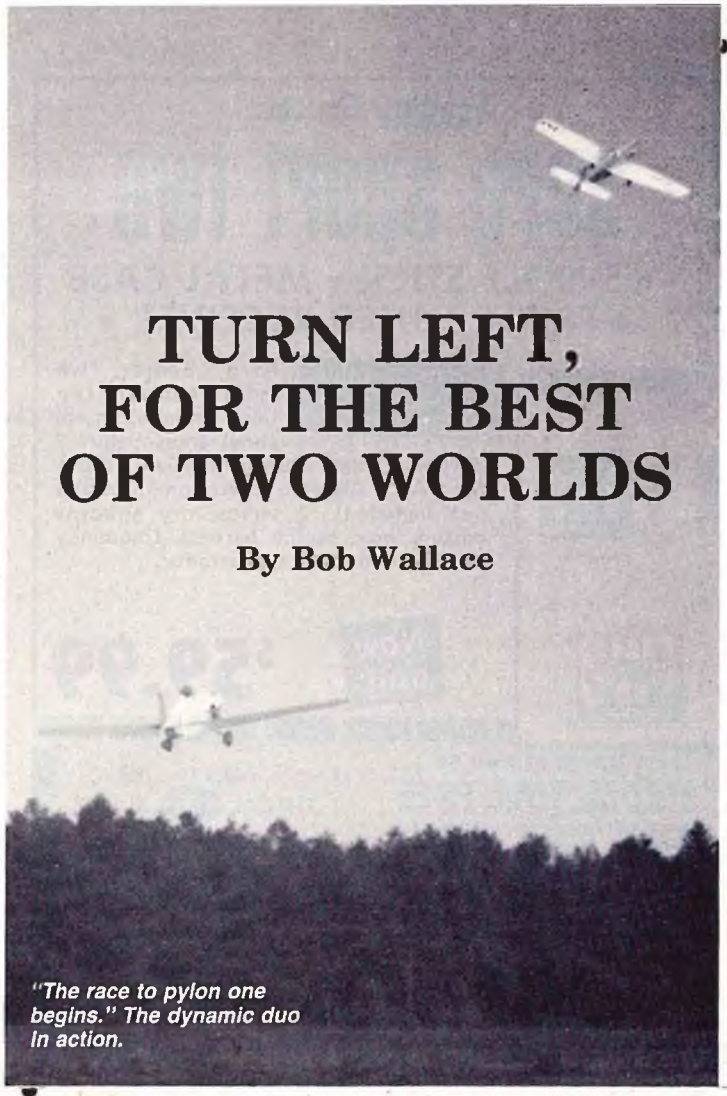
TURN LEFT, FOR THE BEST OF TWO WORLDS

By Bob Wallace



"The race to pylon one begins." The dynamic duo in action.

Formula One-40 . . . a new form of R/C air racing? Well, sort of, but not really. Actually, Formula One-40 is a combination of the best features of two established R/C racing events — Formula One and Quickie 500. This new event combines the sleek, good looking, smooth flying Formula One aircraft types with the inexpensive, reliable Quickie 500 type of engine; in this instance, the ever popular K & B (#8011 or #4011) .40 R/C engine.

In truth, the Formula One-40 event was proposed several years ago, but, as is often the case, never progressed beyond the discussion stage. The decision to quit just talking about such an event, and to actually try it, was born partially out of necessity. In the northeast, as well as in other parts of this country, the noise, expense, and availability of competitive engines, has sharply reduced both the number of contestants and contests in Formula One racing. While the unmuffled whine of a Formula One racing engine may be "music to the racer's ear," it is not viewed in that light by the general public. As most of us are aware, more and more flying fields are being threatened, and even lost, due to noise complaints, and R/C clubs have become far more noise conscious. With the exception of R/C clubs that are blessed with flying sites situated in the "boon docks," most clubs have adopted some type of muffler requirements.

The number of flying sites in the northeast where an unmuffled Formula One aircraft may be flown are very limited and are becoming even fewer in number. (I suspect the same situation exists in other parts of the country.)

In the northeast, there are a number of RC'ers who have wanted to participate in Formula One, but could not, simply because of the lack of a flying site where Formula One aircraft could even be test flown.

This dilemma, combined with the popularity of Quickie 500 racing, led to the actual scheduling of a Formula One-40 race. It was decided that the existing AMA Formula One rules would be retained, except for the following:

(1) The five pound maximum aircraft weight limit was lowered to four pounds.

(2) The only aircraft engine allowed was to be the K & B (#8011 or #4011) .40 R/C engine in stock form.

The other rules were gleaned from the standard Northeast Quickie 500 rules; a stock, commercially available muffler was required, stock wood props only (balancing via material removal from one blade only allowed), 10-15% nitro content fuel to be supplied by the contest management, etc. The use of only K & B .40 engines was prompted by the fact that this is the only engine allowed in Quickie 500 racing in the northeast. It was hoped that this would induce present Quickie 500 only racers to give Formula One-40 a try, since they already owned a suitable engine. The K & B .40 (#8011 or #4011) is, without a doubt, the most readily available R/C engine. It is reliable, inexpensive, and its parts availability is second to none!

Credit for obtaining an AMA sanction, and actually hosting the first Formula One-40 race, goes to John Smith of Custom Model Products, and the South Shore Radio Control Club of Bridgewater, Massachusetts. The first Formula One-40 race was scheduled for October 24, 1982.

With the announcement that a race would definitely be held, the building of new Formula One-40 aircraft and the adaptation of existing Formula One aircraft began. The lower four pound minimum weight limit made the building of an all wood racer quite feasible. Older Formula One kits that had been collecting dust in someone's shop, or on a hobby dealer's shelf, became a sought after item. The conversion of existing Formula One aircraft to accept the stock K & B engine was easily accomplished by some Formula One racers, although the total overall aircraft weight for these converted types remained well over the the newly established four pound minimum.

Those modelers who opted to construct new aircraft for the event discovered that building racers very close to the four pound minimum weight limit was easily attainable. Eliminating the standard Formula One method of lightweight fiberglass cloth and resin, painted finish in the wing and tail surfaces, and finishing them with heat shrink film covering such as MonoKote, saves a considerable amount of weight. The K & B .40 engine, complete with muffler and engine mount, is substantially lighter than a racing type Formula One engine. While an 8 or 10 ounce fuel tank was required for a racing type 40 engine, a four or six ounce tank is more than adequate for the K & B .40 R/C engine.

The film covering of the wing and tail surfaces also hastens the assembly process.

Existing Formula One aircraft that were outfitted with the stock K & B engines all flew very well. (The dire predictions put forth by a few Formula One racers, that these converted aircraft would be "poor flying turkeys," proved to be totally false!)

The newly constructed lighter weight aircraft were, as expected, decidedly faster than the heavier, converted Formula One types. The speed of a typical Formula One-40 racer is noticeably faster than a Quickie 500 type racer, yet slower than a normal Formula One. Half way between the two would be a good evaluation.

In the past, the progressional step up from Quicke 500 racing to Formula One has been a large one for most racers. Getting new fliers into Formula One racing has proven to be far easier than keeping them there. Few Formula One racers would disagree with the observation that more Formula One aircraft are damaged during landings than at

Line-up of Formula One-40 racers. (L to R): Pete Reed, Keith Palmer, Bob Wallace, Don McStay, George Denault, Ernie LaChance, Mickey Frazier, and Mark Karli.

"Denight Special" built expressly for Formula One-40 event by Bob Wallace — weight 4 lbs. 4 oz. Original molded fiberglass fuselage, foam/balsa wing, EconoKote on wing and tail surfaces.

"Miss Dara" former Formula One aircraft converted for Formula One-40 racing. Owned and flown by Don McStay.

Start of race (L to R): George Denault holding Ernie LaChance's "Lil Toni," Pete Reed releasing Keith Palmer's "Estralita." Starter is John Smith.

Cleaning hands or warming them? Termperature was in low 40's. George Denault with Prather "Lil Toni". Aircraft in background is a Denight Special.

Start of Race (L to R): "Dara" owned by Don McStay and being held by Dave Abbruzzi, "Toni" owned by George Denault and being held by Ernie LaChance, "Ricky Rat" owned by Mickey Frazier just taking off.

"Business End" of "Denight Special." Mac flow-thru muffler, D & W 8⅝"D. — 6⅝" P. prop.

Prather "Lil Toni" owned and flown by Ernie LaChance — built for Formula One-40 racing. Weight 4 lb. 4 oz. with 500 mAh battery pack.

any other time. The Formula One landing phase is undoubtably the most difficult aspect to be mastered by the newcomers to Formula One.

The lighter weight, throttle equipped Formula One-40 racer has greatly reduced this frustrating and discouraging pitfall. RC'ers who built their first Formula One-40 racer, have had absolutely no difficulty in flying and landing their aircraft. In every instance they have expressed surprise at how well these aircraft fly and how easy they are to land. The enthusiasm displayed by these new builders of Formula One type aircraft has been excellent. It would seem that the "psychological security blanket" provided by having a throttle equipped engine is a valuable plus. The lower minimum weight limit of four pounds makes a Formula One-40 a real "floater" on landings. Landing "touch down" speeds are actually slower than many sport type aircraft!

The first Formula One-40 race on October 24, 1982, in Bridgewater, Massachusetts, was held on a cool, sunny day with a brisk cross wind (temperature 40°-50°; wind 10-15 mph).

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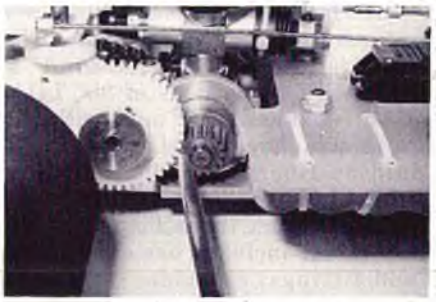
This is the RC500 built by Rich Lee and driven by Rich, Chuck Phelps and Gene Husting to win the Del Mar 6 Hour Enduro race. Rich has dyed all the plastic chassis parts black. This is done by boiling the plastic parts in water with RIT clothing dye. Boil at a very low boil, making sure the parts are covered with the water and only boil long enough until all the parts are fully colored. Although Rich chose a black color, other racers have dyed their cars yellow, or red, or blue or green, etc. The radio tray layout is a little different than usual, because larger batteries were used for longer life in the Enduro. The Rich Lee built K & B 3.5 engine ran flawlessly for 6 hours, with no car problems encountered whatsoever.

A common error on the brake adjustment, is not leaving enough clearance on the linkage adjustment. There should be 1/16" clearance between the locking collar and the plastic linkage when the carburetor is in idle position. Associated also has a new dual steel rotor brake kit for the RC500. Part #5248, $10.00.



Gear adjustment is very important to good bearing life also, and can be easily set correctly. Set the gear mesh so the gears are as close together as possible, without actually touching each other. There should be about a newspaper thickness between the two gears. Twelve different gear ratios are available.

The ride height of the car is very important and is set by the lower "A" arms. To check the rear of the car, lift the rear of the car about 2" off of the

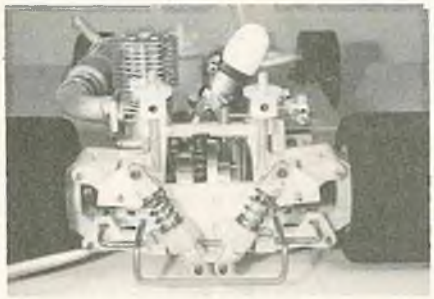
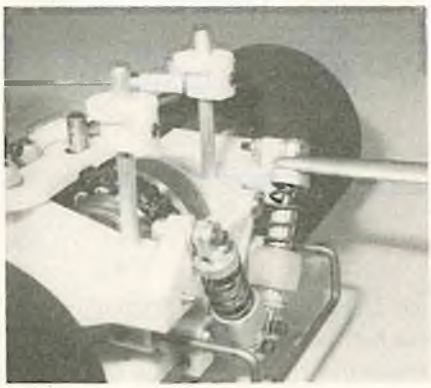


table and let it drop to the table. This is the position the car will be racing on the track. The pointer is showing the lower "A" arms. These should be horizontal or even with the ground. The ride height is set by adjusting the spring adjusting collars on the shock absorbers. The ride height on the front of the car should be set the same way so that the lower "A" arms are horizontal. After the ride height is set, the tweak must be set.



The pointer is showing another spot which must be checked for clearance. If the shock collar is touching the plastic arm at this point, use your X-Acto knife to trim the plastic.

Another point to check for clearance is by the anti-roll bar mount. Trim as necessary.

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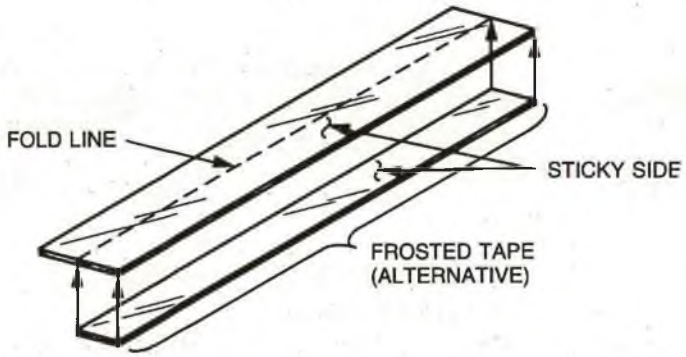
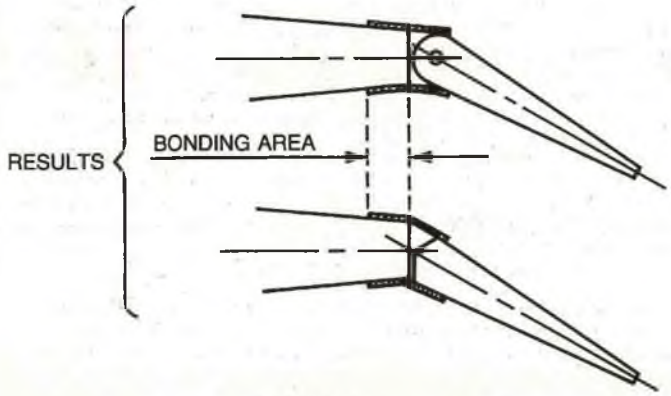
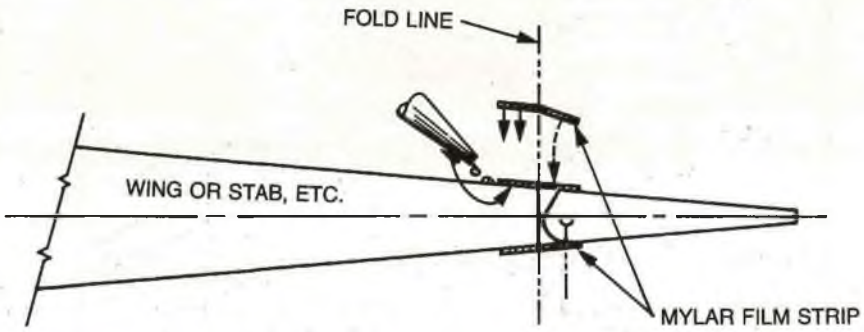
FOR WHAT IT'S WORTH





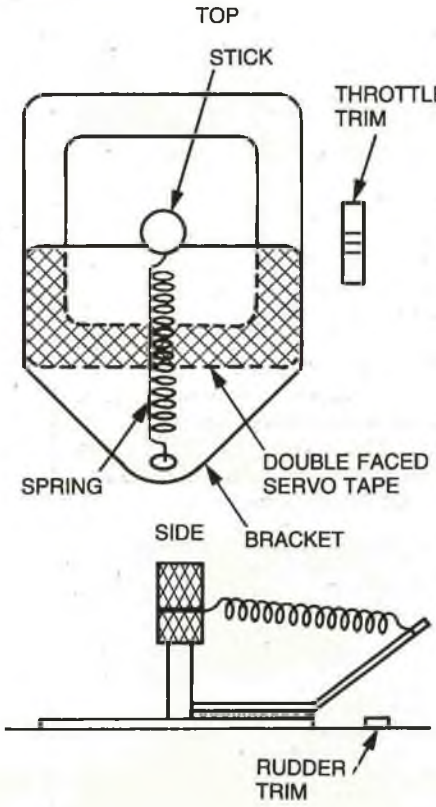


Lonn Rodine, Golden, Colorado, sent in this helpful hint. A simple solution to virtually eliminate turbulent air flow generated by the gap across the hinge line, over the control surface, is as follows:

Materials needed are mylar and adhesive. The mylar can be purchased at any drafting/blueprint supplier. The mylar should be 'frosty' on both sides, one side for adhesive to stick, the other for the paint to stick. The adhesive should be the cyanoacrylate type. Cut a strip of mylar with the length equal to the length of the aileron, elevator, etc., and width variable to suit aircraft. Fold mylar to obtain a straight crease linearly to produce a preload force against the control surface when in motion. Use masking tape at each end to hold mylar in place. Cement for even bonding.

If you are using paint for a finish, isolate the control surface from the mylar by means of paper between them, or installing the control surface last. Either way, the control surface must have its finish prior to installation of the mylar otherwise there is no way to finish under the mylar except to remove it.

An alternate method using Scotch Brand frosted tape utilizes the same basic installation procedure, except bond is made by the adhesive on the tape. See sketches for further clarifications.



Jack Delisle, St. Clair, Michigan, tells us how he gets double duty out of his transmitter. Shown is the device Jack uses to convert his 8 channel, two stick, Mode 2 into a transmitter he could use to run 1/12 electric cars. It lets him use the throttle for the car use without going into the transmitter and is easily removable to return to the flying mode throttle. The upper half of the stick throw operates the throttle on the car. Sketch shows the details.

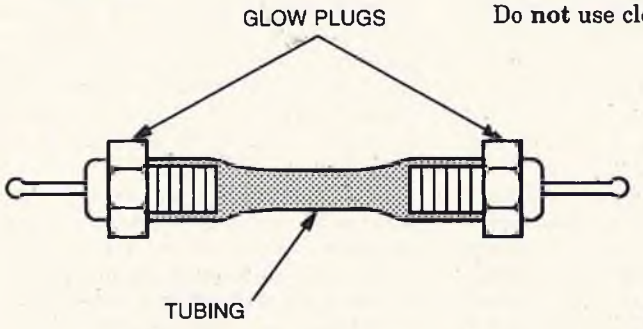
Verne Koester of Taylor, Michigan, discovered a helpful commercial product. Verne has found an adhesive for making sanding blocks that is much better and far easier to work with than rubber cement. It is called Sears Sanding Disc Cement, Catalog #9HT 2220 and costs $2.09 for an 8 oz. bottle. To use you apply one coat to the block and allow it to dry. You then apply a second coat and allow it to dry. When dry, simply press sandpaper to the block. When changing the sandpaper, peel off the worn sandpaper, apply one coat of cement to the block, and press the new

FOR WHAT IT'S WORTH

sandpaper to the block. No more peeling and scraping old sandpaper and rubber cement from worn sanding blocks.

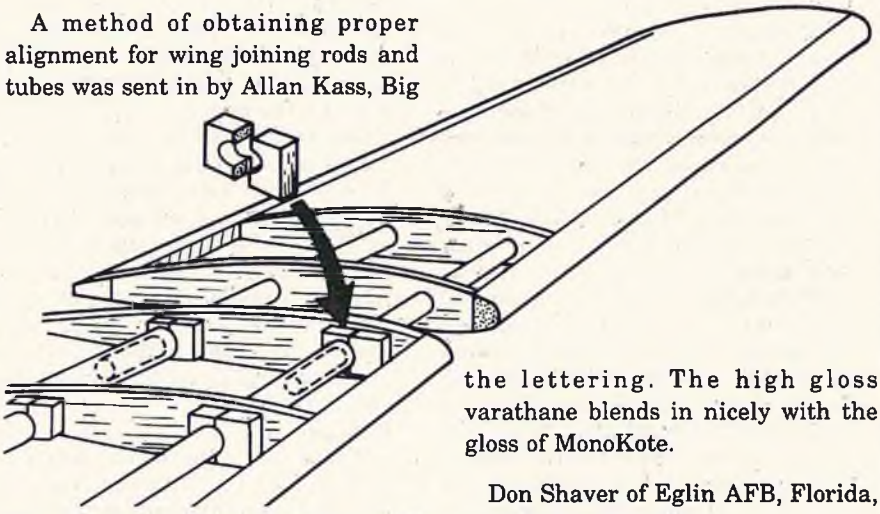
An oldie but goodie worth repeating from Dan England, Bowling Green, Kentucky. Here's a tip in construction that may be useful to some folks. When building a new model, or any time T-pins or straight pins are being used, keep a bar of soap handy. Before trying to pin a piece of balsa or thin ply, stick the pin, to be used, into the bar of soap. The pin will now push into the balsa very easily. You can control the rate at which you insert the pin for more accurate building. The balsa will split less, and the pins will be easier to remove. An additional advantage, glue will not stick to soap. The pins will wipe clean for repeated use. How many times have you reached for a pin only to grab one that has an epoxy glob left from the last time still on it. Grab a bar of soap and try it! This also works great on wood screws.

Paul Wood, Centerville, Ohio, has a simple method of protecting his spare glow plugs. He merely inserts the plugs into the ends of a short length of large fuel line tubing as shown in the sketch.



Ever reach into your tool kit looking for your X-Acto knife only to find the sharp end of your #11 blade? Mark McMullen of Los Alamitos, California, did and immediately found a solution. Try a cap from a Bic pen and insert it over the blade end of the knife. Use different colored caps (black, blue, red) for locating your knife easily and for referencing different blades.

A method of obtaining proper alignment for wing joining rods and tubes was sent in by Allan Kass, Big Sky, Montana. The rods are securely installed in one panel. The mating panel, with oversize holes, is clamped to proper alignment with tubes in place. The half blocks are then glued into position as shown in the sketch.

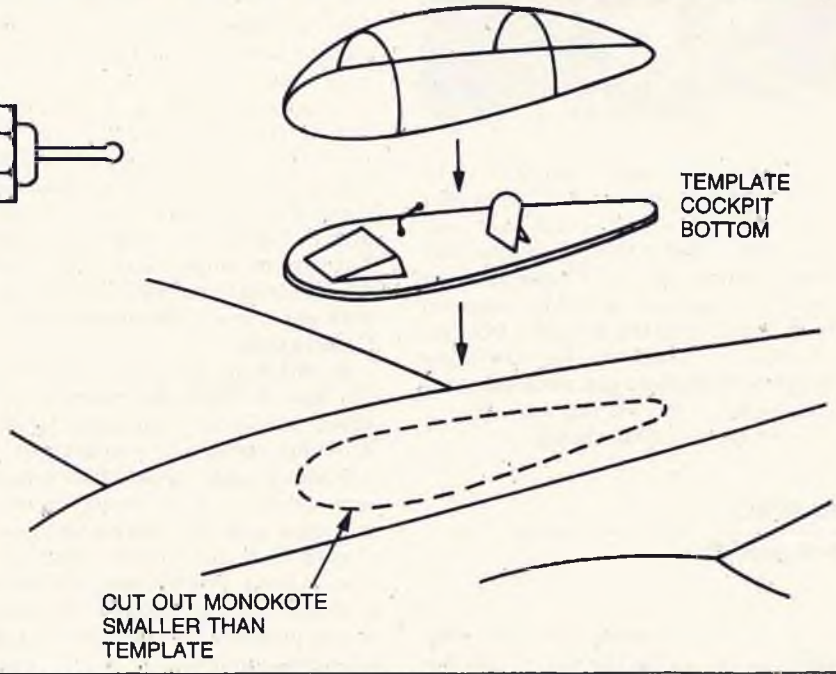


Here is a suggestion from Kim Nicholas of Pullman, Washington. To put numbers and/or letters on planes, boats, flightbox, etc., Kim uses those rub-on letters that can be purchased from any business or art supply store. (He uses Chartpak® from J.K. Gill.) They come in black, white, and in several sizes and several styles. To fuelproof and waterproof, paint over with clear, water clean-up varathane. Do **not** use clear dope, as it will melt the lettering. The high gloss varathane blends in nicely with the gloss of MonoKote.

Don Shaver of Eglin AFB, Florida, sent in the following.

Here's a quick and easy way that Don has found to put canopies on a MonoKoted surface. He makes a 1/16" ply or balsa base on which he mounts the headrest, pilot, instrument, etc. Don then cuts out the area of MonoKote where the base will be located. Hot Stuff or 5-Minute epoxy the base to the fuselage; lay a bead of 5-minute epoxy around the base and position the canopy in place. It's neat and it stays on. The accompanying sketch should clarify any questions.

Send your hints & kinks to R C Modeler, P.O. Box 487, Sierra Madre, Ca. 91024 & win a free book from RCM's Anthology Library Series if your idea is used.



TURN LEFT

from page 117/116

Without getting into a lengthy race report, it can be stated that the event was regarded by all contestants as being an excellent one. Spectator response was also high, as the race had been announced on television, and some modelers even traveled distances of well over 100 miles to evaluate this new R/C racing class first hand.

While a Formula One flier won the race, it is interesting to note that both second and third place were captured by Quickie 500 racers, with no prior Formula One experience. Both had built aircraft especially for the event.

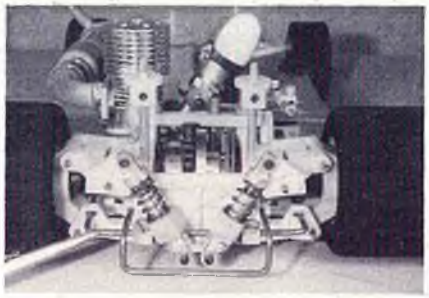
The response to Formula One-40 has been so enthusiastic in the northeast that several races are already in the planning stage for 1983.

As the popular saying goes: try it — you'll like it! We certainly hope that you will. □

PIT STOP

from page 121/95

The rear anti-roll bar must be able to rotate freely as the car moves up and down. The pointer is showing the rectangular anti-roll bar hole in the lower "A" arm which should be beveled so it does not bind the bar.



Different size anti-roll bars can be used to tune the chassis for different tracks. Start with the 1/8" anti-roll bar on the front of the car. On the rear anti-roll bar, use a 1/8" size on high traction tracks, a 3/32" size on medium traction tracks and a .078 size on low traction tracks. On very slippery tracks you can even take the rear anti-roll bar all the way off.

Good luck in your racing. □

RASCAL

from page 87

..... inside the radio box sides as shown on the plans but the radio box was not deep enough for the S7 servos. The Futaba nicad receiver batttery was too long for the opening and could only be installed with much difficulty. This can be fixed by moving the radio box rails to the top of the sides. This will give 1/8" more depth and 1/4" more width and length to the box. But the rest of the box is so small there is insufficient room for all components and foam to protect them. The radio box must be very well-planned to even get everything in. We used Sullivan Gold'N-Rods but they must be unhooked to get the receiver in and out. Bluntly, the radio box is too darn small. There is room in the hull to make it larger but that planning would have to be done before decking the hull.

Engine:

We epoxied in the cup hooks for the 6 oz. fuel tank and then mounted the K & B 3.5cc outboard engine which had been modified externally for hydro racing, but was stock internally. We set the engine as low on the transom as it would go (dictated by the mounting nuts inside the transom) and used a Moto Tool to slot the holes 1/4" long. This put the center line of the prop shaft just below the bottom of the sponsons.

Finish:

We air brushed the boat with white Hobbypoxy, applied metallic tapes and decals, then sprayed it with Hobbypoxy clear. We sharpened the turn fin to a knife edge and installed it with the screws provided.

Running:

After everything was reinstalled we took the boat to the pond for a test run, but all we got was prop cavitation. We removed the engine and installed a K & B outboard tilt mount and set the mount as low as it would go on the transom. We tilted the bottom of the engine back 5° and installed a J.G. F-25 prop.

Upon returning to the pond and launching the boat, we were impressed with one of the finest running tunnel hulls we have ever seen. The "Rascal" came on plane perfectly and did not porpoise at all. Turns were smooth and steady. Speed was adequate but could be even faster with more prop experimentation.

Conclusion:

By following the plan, you can build the Rascal. With the minor changes noted it will be a pleasure to build. Without running instructions the beginning boater would find it nearly impossible to get running unless he had good help. An experienced boater should have no trouble overcoming the minor problems. Once the problems were ironed out, the Rascal was a pleasure. We will be racing it later this month. □

GIVE IT A WHIRL

from page 86/84

in the control levers.

(3) The screw which held the flybar control arms to the flybar had not been fully tightened so the flybar control arm could move a small amount without moving the flybar itself.

All of these small errors added up to a control system which certainly would have given considerable problems to the builder/flier when he started to attempt his first hovering. This attention to detail to provide a very low threshold between control stick movement of the transmitter and the control surfaces, whether they be paddles or blades on the helicopter, is an extremely important point which seems to be the most overlooked one by the beginner. I like to describe the results of it as the "dead space blues" because given a fairly high spring break-out force on the transmitter sticks, which is often the case with most of the less expensive radios, and given a large amount of threshold such as we've just discussed, it's almost impossible for anyone, let alone a beginner, to hold that helicopter in a stationary hover. When a pilot is hovering a full size helicopter, his stick movements are extremely small in the order of perhaps 1/8" which, scaled down, would be equivalent to much less on our transmitter sticks. This is the magnitude of movement which are required to hold the helicopter in a stationary hover. It is very important, fellows, if you are beginning R/C helicopter flying, to make sure that your control system is given a lot of your attention before attempting to fly. All of the links, control rods and control levers must be connected together so that the amount of "lost motion" is extremely small. An "expert" flier will sometimes spend several hours on these setting up procedures.

Well, having accomplished a good tight control set-up in pitch, roll and tail rotor control, we moved on to the pitch angle settings of the main rotor blades. I found that this had been done reasonably well and the difference in pitch angle between the blades was so small that I decided to leave it until I had tried the first hover. I made the assumption that the blades and flybar had been balanced properly and, as it happens, there was no problem here.

I took the helicopter outside, fueled it up and immediately ran into the next problem, which I'm sure a lot of beginners experience. The glow plug battery was hooked up and the electric starter used to "spin up" the engine. After a few minutes of useless churning of the engine with no

"poppin" at all, I realized that the idle adjustment on the carburetor was probably closed too far. Once you have had some experience with the glow plug engine you know that a failure to start is either due to a glow plug not glowing or the fuel not getting through. The glow plug not glowing is readily checked by testing your glow plug battery on another plug or by removing the plug and seeing if it glows good and bright. Usually, however, the plugs do glow okay if the battery connected to them is a good one and almost every time that there is not a glow it is due to a battery being dead or has insufficient power. The glow plug pulls quite a bit of current, you know. I prefer to use a glow plug battery which has a meter in the line or a glowdriver with a meter so that I can actually "see" what is happening inside that cylinder head. Sometimes saves a lot of time and heartache.

Well, anyway, assuming a good glow, a failure to start must be a lack of fuel into the cylinder and again, most often, this is due to an idle adjustment that is closed too much at the idle setting so that the fuel is not sucked into the engine. Of course it could also be due to dirt obstructing fuel flow. I think, in an earlier column, we described a way of checking this which was to place a 12" piece of fuel tubing onto the carburetor fuel nipple and blow through it with your mouth. The throttle levers on the transmitter set to the idle position. That is to say, trim set up full and main throttle lever set at zero. If no air passes through the carburetor (and you will hear it by a hissing noise) then you should open the idle screw gradually until you just hear the hissing of air. Close the screw 'til the air flow stops, and then open 1/2 turn. You'll then be somewhere in the ballpark for the right setting. The main needle jet should be set in the order of 1½ to 4 turns, depending on the engine. Typically engines, such as "O.S." or those with that type of carburetor, need to be open 1½ turns or so, whereas "Super Tigres" with the finer needle valve taper need an opening of as much as 4 or 4½ turns. So, now that the idle adjustment was set so that fuel very definitely goes through to the engine and with the main needle valve set the appropriate amount, we then tried the starting procedure again. Sure enough, this time the helicopter popped off almost right away.

Now, having put the helicopter down on the ground, I realized that I hadn't checked the neutral trim position of the swashplate but by looking I could see that it was tilted very slightly to the left when my right hand stick was in the center position with the trim in the middle, too. This, of course, is not correct for the hover since most helicopters need a slight amount of right swashplate tilt for a stationary hover. I decided, however, to continue to try the helicopter first by pushing the trim hard over to the right. Once the helicopter was lifted from the ground I found the blades were tracking reasonably well but the one with the colored tip was slightly high. At the same time I noticed that the engine was laboring slightly and the blade speed was low. The correct main blade rotor speed will vary between 1,500 and 1,800 revs per minute on most modern helicopters. Since the blade speed of our particular machine was not fast enough I decided to drop the blade with the colored tip rather than raise the other one. This would then have the effect of increasing the speed (because we would have less total rotor blade drag) and would also bring the tracking correct. To drop that blade I reduced the angle of incidence by adjusting the blade holders. A second test hover showed that I had the adjustment about right, the engine was "burbling" at a nice speed and the main blades were in track.

At the point of lift-off, I noticed the position which my sticks were held in to keep the helicopter stationary and I immediately landed again. I found that I needed some right swashplate, as we suspected, and a little bit of forward trim while the tail was reasonably okay. However, I usually like to have the tail trim set slightly to the right in the hover because in forward flight you need quite a lot of left trim, as we discussed in our articles on forward flight. My next step, then, was to adjust the ball joints or clevises on the control rods so that the tail neutral setting was moved slightly to the left, meaning that I needed some right trim to restore the correct hover datum. Now I had my rudder trim in the position I wanted — slight right trim for hover.

For roll control I adjusted the control rods until the swashplate was tilted slightly to the right when the roll trim was centered. For pitch control, since a small amount of trim seemed to do the trick, I left the adjustments on the helicopter as they were.

Now we lifted into the hover again and found that because the helicopter was virtually "trimmed out" we could remove our hand from the right hand stick for a period of a second or two and the helicopter would stay in a stationary position. This also applied to the left hand since, once a helicopter is in trim, it will really stay in one place, maybe for only a second or two, if left alone. This means that the learner's task is eased considerably if the helicopter is trimmed since the movement that he needs to keep the helicopter in a stationary hover are very much less, both in magnitude and in frequency. By the way, I find that it helps considerably if the springs which center your control sticks in the transmitter are adjusted or changed so that the centering forces are very low. Unlike a "plane" you will seldom fly exactly in trim for very long and also, since the control movements you will make are very small, a strong "break-out" force seems to make life much "harder" than it should be. So, if you cannot manage it yourself, get your local radio expert to reduce the spring forces on your sticks.

Now I landed the helicopter again since the engine was "burbling" quite rich and I leaned out the needle valve just a little bit. By the way, in this respect it is very important to ensure that the engine of a helicopter is run quite "rich" since you are continuously demanding a high level of power from the engine and this means that the engine will run quite warm. If we keep the engine "bubbly" rich it will provide the extra oil to keep it cool so that you won't be plagued with overheating problems.

Well, I'm not sure if this column is going to help but at the time that I encountered the problems described above, my thoughts immediately went to all of you out there who are struggling to learn. So it seemed to me if I described some of the measures I had taken to turn a helicopter which was almost unflyable into one on which a beginner could learn, this may help more of you to start flying. Believe me, if a helicopter is well-built, well-adjusted and well-trimmed it really is considerably easier to fly than we implied earlier in this column. However, given a poorly adjusted helicopter with lots of lost motion and a badly adjusted engine, even some of the best experts would have a hard time.

Please keep the letters rolling so that I understand the problems you are having out there and I'll do my best to help you if I can. See you next month. □

TOURNAMENT OF CHAMPIONS

from page 65/62

4093.3. Hanno maintained a respectable lead throughout the contest while the rest of the pack jockied for position until the end of the semi-finals. Selection of the other finalists really wasn't secured until the end of the last qualifying round because of the superb flying of all of

the contestants. Interestingly, however, was the fact that the five finalists placed in the same order as they had in the qualifying rounds.

Special mention should be made of the contributions of Wayne Ulery and Don Chapman. Wayne provided the popular Laser 200 model designs and Don was deeply involved with power plant modifications for several of the contestants, particularly with the Tartan Twin.

Highlighting the meet was the full scale Eagles Flight Team, featuring award winning pilots Charles Hillard, Tom Poberezny, an Gene Soucy flying their 260 hp Christen Eagle biplanes in a display of close formation precision aerobatics unmatched outside the realm of military jets. Other special attractions included the Peter Stuyvesant R/C Formation Flight Team from West Germany and the Kalt Sangyo R/C helicopter demonstration team from Japan.

Checks and mementos were presented to the semi-finalists during a gala Awards Banquet at the Frontier Hotel. Also honored were Contest Director Phil Kraft of Oceanside, California, Chief Judge, Dr. James "Doc" Edwards of New Albany, Mississippi, and Tournament of Champions Co-Founder, Walter Schroder, White Plains, New York. Assisting in presentation of awards to the finalists at R/C Model Airfield was noted singer Robert Goulet, who was appearing at the Dunes Hotel in Las Vegas.

Having attended all of the tournaments, each time we are amazed at the tremendous amount of planning and the number of people required to efficiently conduct an event of this magnitude. Mel Larson, Circus Circus VP, Marketing, has the overall responsibility of making it happen. Phil Kraft was the Contest Director and Dr. James "Doc" Edwards was Chief Judge. These are the big title jobs and were professionally handled.

Among those people who performed some very important tasks were the following unsung heros: Flight Line Director, Phil Rumbold; Flight Line Communications, Bill Payne; Unknown Sequences, Steve Nelson; Tabulations and Scoring, Betty Stream, assisted by Suzi Stream, Peg Wilson, Jackie Edwards, and Pat Godfrey in tabulations. Assisting in Scoring and in Aircraft processing was Dee and Larry Kosta. Chuck Rigsby, a Continental Airlines pilot, provided the computer and programming that he has used in full size aerobatic competitions. He used the Bower Tarasov system for scoring computations. Maurice Franklin handled the public address system in a superb manner with his delightful English accent.

The all important job of flight judging was accomplished by a panel of experts who are the Who's Who of aerobatic judging. There were Geoff Franklin, Dave Lane, Travis McGinnis, Clint McHenry, Steve Nelson, Gordon Price, LaMar Steen, Bob Upton, William "Buck" Weaver, and Gerry Zimmerman. Internationally honored Betty Skelton Frankman was scheduled as a judge but was regretfully compelled to withdraw due to a sudden serious illness of her husband.

The Circus Circus International Tournament of Champions is unquestionally the premier modeling event of the world. Aside from the extremely generous cash prizes, the TOC has established unequaled standards of excellence for performance of aircraft and contestants. Even though the TOC is a unique departure from usual established pattern contests, its influence on aerobatic competition can be noticed in the latest FAI pattern turn-around procedures. Then, there is the glamour of Las Vegas, the thrill of watching the modeling world's best aerobatic pilots displaying their skills, the opportunity to meet and chat with celebrities from all types of endeavors. For some of us, one of the most enjoyable aspects of the TOC is the privilege of visiting with the gracious Mrs. "Sam" Bennett. To Mr. William G. Bennett, our thanks for a superb model meet. □

CHEETAH

from page 58

Following our regular practice, we laid out component parts on the workbench, opened the instruction manual and read it through while checking various parts, fit, etc. In the course of this run-through, we came onto a few small hitches of no huge consequence but still worthy of mention, we feel. First, we found that our eight page instruction manual contained only about one and a half pages of assembly instructions. Two pages (the centerfold) had an exploded view of the car — but we already had one of these on the bottom of the box! Matter of fact, due to the quality of the hard surface, the drawing on the box was cleaner and sharper than the one in the manual. A portion of the two page centerfold had drawings and schematics of the battery assembly, wiring diagram, reverse switch diagram, as well as the throttle servo arm modification. But the exploded view in the manual was wasted space in view of the other better one on the box bottom . . . and it took up the biggest chunk of the two page centerfold as well. Oh well, better two drawings than none at all, we figured, and forged ahead.

As we began assembly, we ran into the small discrepencies mentioned earlier. The drawing in the manual pictured the two 5-40 x 5/8" kingpin screws running **up** through the chassis plate, axle beam, and steering blocks, with the nuts on top. Looking at the drawing on the box, we noted that on it the same two 5-40 x 5/8" kingpin screws ran **down** through the steering blocks, axle beam, and chassis plate, with the nuts installed at the bottom end! It really didn't seem to matter which way they went, and just for the record, we followed the exploded view in the manual and went up from the bottom. Are we being too picky here? Perhaps, but the first timer might experience a wee bit of confusion, minor as it is, and remembering back we know that confusion is the last thing a novice needs.

To continue . . . assembly went along in pretty good shape, and then we ran into another small "problem." We came to the point where the torque spring was to be installed . . . or so said the maual. We found what we thought was the rascal and looked at the exploded view(s) to confirm it. Yep, there it was . . . but wait a minute — there was no part number assigned to it on either drawing. The written instructions in the manual gave no part number. Going down the parts list on the back of the box we found it — part number 24, torque spring. Parts number 23 and 25 were on both drawings, but for some strange reason old number 24 didn't make it. Oh well, the drawings did show where it was supposed to go, and place it there we did.

Batteries must also be assembled by soldering them together via their solder tabs — a very simple job, really, and covered well in both written instructions and diagram. While the soldering iron was hot, we wired up the speed control and reverse switch, and connectors. This is where the very fine drawings saved the day. Taken slowly and carefully, we found no great problems in wiring as per the centerfold diagrams.

We used diagonals to snip both ends of the throttle servo arm to rough shape, and finished off using an X-Acto kife and a flat needle file. A slight angled, rounded end on the throttle servo arm is necessary to actuate the reverse switch, and the drawing detailed this step very well.

Radio and Electrical:

Remember, this rascal is 1/18th Scale, and that means room is at a premium. The space for the receiver and two servos is limited, though still adequate provided small servos are used. We found our Cox two channel with micro servos did just fine.

As per instructions, we used the charger cord (included in the kit) to charge the batteries for five minutes the first time around. This gave us power for checking out servo operations, and also to find out if this little devil would go as fast as it looked like it would. Before leaving, we want to echo Parma's warning regarding the small exposed resistor on the charge cord. We were warned that it gets hot and found that indeed it does. 'Nuff said.

Performance:

Our initial blast off took place in our hallway, and we must confess that we never before realized just how very short it was! At least so it seemed to us as the little Cheetah zipped (and we do mean zipped) down it went and disappeared somewhere into the livingroom ... in no time at all. It didn't take long to realize that the short wheelbase, fast steering, and fantastic acceleration added up to high performance and a real fun challenge.

We have since run Cheetah on all sorts of surfaces ranging from asphalt tile, carpeting, cement and asphalt driveways, and it seems to take them all in stride. Our favorite "track" turned out to be a tennis court where we made like Richard Petty . . . almost. Acceleration and steering take a little getting used to, but practice brought things under control, nicely, thank you.

Conclusion:

Parma has done a fine job on their 1/18th Scale Cheetah, and we have nothing but praise for the fit and finish of all parts. The assembly was straightforward and should not, in most cases, give any problems. Our only misgiving (and we admit it is a slight one) is the few minor discrepencies we ran across in the instruction manual. They gave us no real trouble, but we can't help but feel that a novice or first time modeler might experience some difficulty because of them.

Performance and appearance, as we have mentioned, are just great, and real fun is the name of the game with this little car. If a change of pace is what you're looking for, look no further . . . Parma has it and Cheetah is its name. □

SILENT POWER

from page 57/55

interchange.

Keith and I arrived quite late Saturday, but did get a chance to put in several flights. Mr. Shaw won the "Most Aerobatic" title both Saturday and Sunday by putting his Leisure powered Barbarian through pattern maneuvers not thought possible with silent powered ships. These included four-point rolls, spectacular climbing rolls, Cuban eights and series of inside and outside loops that had the crowd dizzy. Upon landing, Keith was given a spontaneous standing ovation.

Sunday turned out to be a sunny crisp fall day with thermals popping everywhere.

Roland Boucher of Leisure Electronics and wife Nancy made the journey from Irvine, California, to Pennsylvania for the fly-in. Roland brought with him a prototype "Electricus" designed by Larry Jolly, and soon to be kitted by Leisure. Electricus has a span of 72" with 606 square inches of area using the Eppler 205 airfoil. With a flying weight of 35

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LEISURE GRAND CHAMPIONSHIP

FEBRUARY 26 & 27, 1983

Saturday February 26th: Harbor Soaring Society's field
Sunday February 27th: Mile Square Park

Events will consist of 05 2-Meter sailplanes, 05 Old Timers and Open Class sailplanes. (Open Class sailplanes to allow any motor and any battery.)

Fun Fly Events include 05 Pylon, Scale, and Golden Age Scale.

Awards for the events consist of $500.00 each for First Place in each category, and merchandise through Sixth Place. Fun Fly events will have trophies through Third Place.

For pre-registration, contact:
Roland Boucher, 11 Deerspring, Irvine, Calif. 92714 (enclose SASE)

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oz., Roland had the longest flight Saturday with 22 minutes.

On Sunday "Electricus" and a Zomby by Keith Shaw both had terrific flights, only to be edged out by my own Mark's Models' Mini Bird of Time. Shaw repeated Sunday as Most Aerobatic, flying both the Barbarian and a Stand-Off Scale twin Astro 035 powered Shrike Commander.

However, the competition was secondary to the good fellowship and comraderie between the Silent Fliers. The KRC Club had an informal "social" Saturday night, which proved to be a tremendous success.

All in all, the KRC Electric Fly was a fun, low-keyed event. There was something there for everyone. Scale models ranging from Piper Cub to Super Constellation, aerobatic models, pylon racers, old timers and sailplanes. Silent Power has come of age. The crowd of over 300 seemed to enjoy every minute of the event. "I'll plan my return trip to the KRC fly-in next year. Where else can you watch a half a dozen R/C models soar lazily overhead and still listen to the Rutgers-Penn State football game on your transistor radio?"

Ninth Annual Astro Electric Championships

If you live in Southern California, and have any interest in silent power, mark off February 5th and 6th 1983. For the ninth straight year, Astro Flight will sponsor the Astro Electric Championship for free-flight, control line, and radio control. Of the twelve events open for competition there are five R/C events.

Saturday, February 5, 1983. Magnolia High School, Anaheim, California 8:00 a.m. to 2: p.m. R/C powered sailplane F3E rules. Two classes, 7 cell and open with any motor Electric Oldtimers — a 1.5 minute motor run and a 7 minute max with spot landing points. Two classes, 7 cell and open.

Sunday, February 6, 1983. Mile Square Park — pylon racing, 7 cell any motor — F3E pattern — Sport R/C Scale, Mooney judging system.

Pre-registration is suggested with an R/C events fee of $10.00. For information write to Bob Boucher, 2301 Cheryl Place, Los Angeles, California 90049. Total prizes and merchandise have a total value of $1,000.00. □

PRANCER

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sloppiness in the levers. The spring selected must be heavy enough to serve this purpose. The spring does not

have to be connected to the servo; this was merely a convenient place to hook it. The long torque rods to the outboard ailerons were made by cutting a strip aileron linkage and extending it by soldering the ends into a length of 1/8" brass tubing. Before soldering the aileron end of the linkage, insert the brass tubing into some scrap outer nyrod tubing and position the linkage in the wing. Although there is room for a bigger one, a 6 ounce tank is sufficient for a .35 engine. When the fuel tank is positioned correctly, it should be pretty close to the bottom of the fuselage. If you place the tank too high, fuel will siphon into the engine. Because the engine is inverted, a third tube is more convenient to vent the tank while filling. I ran this tube through the firewall and angled it down toward the bottom of the plane. The tube must be capped when flying, so make a cap out of a short length of fuel line tubing by closing one end. To fill the tank, I open the vent line (plane inverted for filling and starting) and fill through the line that attaches to the muffler fitting.

Note that the main landing gear is located about 3" behind the Center of Gravity. This is intentional, and causes no rotation problems. The location of the gear and the nose-down attitude assumed, due to the shorter nosegear, allows much smoother landings and controlled take-offs.

The flap action should be no more than 30°. This plane will fly very slowly without the flaps down and too much flap action could cause a stall on a slow approach. I suggest putting the flaps down as soon as you start your final approach. Don't wait until you are over the runway or you may get a surprise! If the plane is going too fast, flaps down will act exactly like up elevator.

The flying weight of the first model is 6 lbs. The plane is covered with Coverite and finished with K & B Super Poxy. I finished the second plane with MonoKote, not so much to reduce weight, but to test the foam ribs with a lighter weight covering. I had the occasion to give the MonoKote wing a good test on my first day out. I lost the engine on a high approach and tried to go around again. Unfortunately, I had left the flaps down and the plane tip stalled on my final turn. My two-point landing (wing tip and nose cone) caused the wing to pop off intact, with the wing blocks. The flying weight of the MonoKote covered model was 5 lbs. and this proved to be too light. I have since added some lead for ballast because the plane bounced around too much in the wind. Be careful when

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PRANCER

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setting up the incidence of the stabilizer. The curves of the fuselage will deceive you. Both models flew straight from the start, but had a tendency to climb.

If you intend to use the rudder, make sure you have plenty of throw on it. It is quite inefficient due to its position out of the prop blast. It's great for flat turns, but will not roll the plane. □

VOLKSPLANE VP-1

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the lumber yard. A lot of strips can be ripped from one of these. We spent one whole afternoon ripping stringers and spars, leading edges and trailing edges. Another evening was spent cutting ribs from balsa. Templates were made from 1/16" ply and each rib was cut individually. Then a hole template was made and a sharpened copper plumber's elbow was used to cut the holes in the balsa ribs through the ply template. The rectangular holes for the spars were cut with a #11 X-Acto blade.

Designing the hole location was fun, getting things set up so there was always a hole in the right place in each rib so the drag wires could pass through. Since we live on the Pacific Coast, finding plastic coated stainless steel leader wire wasn't too hard as many streets in our city have wall to wall bait and tackle shops. You can perhaps order the wire from the catalog of your favorite fishing supply house. Do not forget to order the

bronze swages necessary to close off the ends of the wire.

The only real problem in constructing the fuselage is the pivot for the rudder. Do not cover the top of the fuselage nor add the cross brace until the pivot tube is finished. It is better, too, to put the blind mounting nuts in the rear former for the stab pivot before adding top ply sheeting.

We fabricated our own landing gear but Sig has a blank, as mentioned on the plans, and the HallCo heavy with 18" tread will come close. The wide fuselage complicates things because the mounting surface on the gear is too small.

The struts are functional and must be attached firmly at both ends. At the wing end, they are pinned permanently with 1/16" wire. At the fuselage end, the brass strips were threaded and a 2-56 machine screw holds the two brass plates tight on both sides of the cockpit formers.

A spring loaded set of pins are used to hold the metal spar retainers to the proper former. When you place your servos and receiver in the radio compartment, you must leave room to get these pins in and out. We remove only one wing and what is left will fit in our compact station wagon.

In the finished plane, the aileron servo wound up flat rather than upright as shown. This we we avoided bending the aileron pushrods. See picture to clarify the hook-up method.

Be careful that your plane balances where indicated on the plans. A slip-up in this area almost caused a disaster during the first flight. Eight ounces of weight was added inside the cowl; the second and succeeding flights were excellent. The VP-1 is a floater; do not use the same landing method you use with your Super Duper .60 Speedster or it will float the full length of the field and you will see it disappear over the fence at the

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VOLKSPLANE VP-1

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boundary of the field. Come in low and slow.

If you insist on pure scale, order the booklet mentioned in an earlier paragraph; the stab is a little over size. We hope that you, as we did, find the Volksplane a challenge to build and a joy to fly. □

SCALE VIEWS

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what we're trying to say is, "don't limit yourself." Look around at the tools and materials that are used by other hobbyists. Even the most specialized of tools represent an investment in precision. And, even if you use a specific device only a couple of times a year, it's often well-worth the price of its acquisition. Consider wing and fuselage jigs. Most of the time they're collecting balsa dust. But, when you use them, they result in straight fuselages and warp-free wings — and good **flying** scale R/C models. Keep an open mind, expand your personal horizons — and see what other hobby tools are available that can be used or adapted to your building techniques. I believe you'll be surprised and delighted at what you can find!

Scale Noise

A couple of years ago, the **big** controversy among R/C scale modelers was "Realism In Flight." The "good book" maintains that a full ten points of a scale model's (and modeler's) **flight score** should be based on a judge's evaluation of how well the model performed, given the flight characteristics of the prototype airplane. If you don't roll your B-17 model, or try to loop your B-25, chances are you may score high in "Realism In Flight" (even though both maneuvers have been done by the "real airplanes").

Part of the "to do" about flying R/C models "realistically" was concerned with "scale speed." There were the proponents who demanded that a model fly at a speed directly proportional to its size. In other words, if your model was 1/10th the size of the "real thing," it had to fly 1/10th the prototype's speed. This didn't work out too well, particularly if you were modeling, say, a 90 mph "Cub." The model just wouldn't stay in the air at 9 mph! Another "camp" said, "Forget the mathematics, just fly the models slower." Then, there were the proponents who averred, "There ain't no such thing as scale air." And, all the while, the "Giant" modelers were announcing to all of the world that **their** birds were flying a lot more "realistically" than the smaller scale models (with some justification).

The point is that we've all gone through the "realism" phase of scale R/C model flight — and just what the word means is left to the judgment of those long suffering creatures, the flightline judges.

There is one, very big area, when we talk "realism," that hasn't really been addressed — noise! There **have** been some favorable comments, in the model aviation press, about 4-cycle engines "sounding like" the engines in "real airplanes." Some **geared** and **belt-drive** engines have been touted as providing a "realistic sound." And, the muffled chain-saw engines in the **big** birds, running at lesser rpms, are claimed to duplicate the putt-putt of a Franklin or Continental. Some proponents of the new, multi-cylinder model radial engines claim a somewhat "real" sound from them. Finally, piped engines mask the engine's scream and provide a semi-realistic sound because most of the noise is generated by the propeller. But to be truly honest about it, there

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are few models today that even approach their prototypes in the noises they make while airborne.

Of course, the problem begins with the rpm that model engines must turn up to in order to generate their power. The average glow-plugged "screamers" hit between 10 and 12-grand. In real propeller-driven airplane practice, two thousand to twenty-two hundred turns per minute represent **take-off** rpm (usually **less** than glow plug **idle**). Cruising power, with controllable pitch propellers on real airplanes, only requires between 1500 and 2000 rpm. The propellers on full-sized airplanes **have** to be run slowly — to keep the tips from going supersonic. In models, too, we're approaching "compressibility" with pylon racing engines running at 20-grand, plus. The point is this: the nature of the model engine is to produce "model engine type" sound — and, as long as this is true, one of the biggest deterrents to "realism in flight" is the model-type sounds that our engines make!

It's kind of ironic. You can score in the high 90's in static, and fly your model like an Art Johnson or Don Lowe — and the model still **sounds** like a **model.** Maybe we should go diesel and load our engines with huge props. Or, do the same thing with the currently expanding crop of beautiful 4-cycles. But, lots of torque at low engine speeds may not be the answer. Certainly, there are some acoustic engineers who are also scale R/C model builders. They could make some "points" with a whole spectrum of scalers if they turned their profession toward their hobby.

It would seem logical that they could design a resonant chamber that would make scale models "sound right." First, and most important, the chamber could lower the **frequency** of the perceived engine noise. Cutting the scream to a low frequency "hum" would go a long way toward providing a more realistic sound. Secondly, the chamber could suppress a substantial number of the cylinder firings — and only emit a couple thousand "reports" per minute. This set of specs may result in a "muffler" twice the size of the model — or, one that generates so much back pressure that the engine becomes practically powerless. Until the advent of the "Magic Muffler," I'd have bet dollars to donuts that we couldn't do what is proposed here.

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Now, I'm not so sure!

We might attack the realistic sound problem from the propeller viewpoint. Our model propellers are designed for maximum **aerodynamic** efficiency — translating engine power into moving as much air as possible. A study of blade shapes might reveal some that, with a minimum drop in efficiency, we may achieve a more realistic sound spectrum. Paddle blades might give pull **and** putt. A while back, the Air Force and the Army spent a lot of time, effort and money developing "silent airplanes." The props on these birds were multi-bladed — and looked like flower petals. This technology could be adapted to model use — with good effect — to modify the sounds of our scale ships.

Maybe we could combine some of these ideas. Like: big, wide props, turned more slowly on engines with resonant mufflers — with controllable pitch blades. Another — and **very** far-out solution to the "real sound" goal might involve adapting the "silent airplane" technology completely to our models. Make them so quiet that they don't make any noise at all. Then, using available **computer** knowledge, generate real aircraft sound through a couple of stereo loudspeakers! Setting up a scale flight line might appear like preparations for a rock concert. The sound generator might be tied, electronically, to the throttle stick on our transmitters. Or, to another proportional channel so that we could simulate rpm suitable for the manuevers we're performing. If computers can "talk" to us with electronically generated "voices," they can certainly duplicate engine noises that **sound** like the real thing!

We can't abuse or overcome the laws of physics. They allow us to get our powered scale models off the ground and back down again — to our pleasure and delight. But we **can** discover **new** laws and new applications of the old ones. If we put our minds to it, we can overcome the last "barrier" to realistic scale model flight — scale noise!

★

The following are Pettit Paint Company's latest two Hobbypoxy formulas, which are a third series supplementing those we released on June 16 and August 2.

The following two formulas are extreme examples of why the scale

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SCALE VIEWS

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modelers become so frustrated when they try to shade their own colors. It does take special experience, only because the means of producing these colors is not obvious.

The first formulation this month is **Matte White, FS37875,** which duplicates the flat undersurface of WW II Navy aircraft. When mixed with their Gloss Hardener, the same color represents the undersurface for present day Navy and Marine Corps aircraft, such as the McDonnell A-4 Skyhawk and the F-4 Phantom.

The **Matte White** completes their presentation of the early WW II Navy three-color camouflage scheme, which includes also their two prior formulas for **Sea Blue** and **Intermediate Blue.** To further complicate the situation, **Matte White** and **Sea Blue** alone were used in the latter part of WW II as the Navy's two-color camouflage scheme.

It should be further noted that toward the very end of WW II and during the Korean conflict, Navy aircraft were painted **Gloss Sea Blue** overall. And now for the formula: to a 1/2 pint (8 fl. oz.) of H10 White, add 16 drops H81 Black, 6 drops H49 Cub Yellow and 4 drops H33 Stinson Green.

Their second color this month is **Light Gull Gray,** FS36440. This is used today in a matte finish on the upper surface of the A-4, F-4, etc., along with **Gloss White** on the undersurface. Get your graduate or syringe out and to 50 parts of H10 White add 21 parts H70 Gray, 2 parts H66 Dark Red and just 1 part of H49 Cub Yellow.

They apologize for the fact that it is impossible to make the above formulas as simple as those in the first two releases. □

POWER BOATING

from page 30/27

not had sufficient time to fully test this coupler but if Al is ready to guarantee it for this long, it must be good. If the coupler is not this good, Al will lose his shirt. The coupler fits most 7.5 and 11cc sized pipes. It is not as flexible as most couplers that are on the market so you will have more difficulty sealing the ends with nylon coupler clamps. These couplers are

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stock number STC-1 and list for $4.95 each. I will give you a final report on this new product after I give it the "fire test."

★

Dear Mr. Power,

I want to thank you for the much needed information you supply the many readers of RCM. I am a "beginner" in R/C boating and many things I do not understand about boats, engines, R/C gear, etc., were explained by digging through my past issues.

I was given a 5 year old "Thriftway Too" and a McCoy .19 red head by a friend. It (Thriftway Too) has never been run. I took it to a local hobby shop for some advice and two boat enthusiasts told me it was too beautiful and I should start with a new project. The Thriftway Too was built with a beautiful deck that has been varnished.

I decided to get something inexpensive, easy to build, and just plain fun. I settled on the "Short Stuff" DV 10 fiberglass. I have not started construction as I like to have everything figured out in my head before I start. I am planning on using a Cox QRC .049 engine. Would this engine make this little boat go fast or just putt-putt around? Can I build the rudder assembly and other general hardware to save money, or would the Dumas hardware kit be a worthwhile investment? Would I need a water cooling clamp, or would it be okay if I let the engine rest to cool in-between runs? The Dumas instructions are very poor (in a beginner's eyes, anyway). They say nothing about installation of seals for pushrods and the antenna. I am totally lost on this subject. What do you use for pushrod seals?

Back to the engines, they have a muffler with a rotating sleeve over a hole. I thought this was an exhaust throttle but when I fired one up and rotated the sleeve to cover the hole, no decrease in power was noticed, only a decrease in noise. I would like to have a throttle but if I am right about the above I don't know what to do. Is a throttle really needed on this small of a boat, and a small engine? Thanks for your help, and keep up the good work!

Sincerely,
Chris Tobey
Seattle, Washington

The Cox .049 will power your Dumas Short Stuff but its speed will be approximately 15 mph. You can make your own hardware if you have the materials and the time but most people find that commercial hardware

kits are well-worth the money. You must use water cooling if the head of your motor is not exposed to a good flow of cooling air. I would definitely advise water cooling with this boat. Water tight seals are used for radio box pushrods. You can get Robart waterproof pushrod assemblies from your local hobby shop that stocks R/C equipment. They cost only $2.49 a pair and are strong enough to work on the largest of powered R/C boats. The antenna wire is usually brought out of the waterproof enclosure through a small hole that is sealed with epoxy glue. Kraft Systems also makes a 12" whip antenna that is very nice for R/C boats. It is a bit expensive at $5.50 but works well. The Cox .049 that you have doesn't have a throttle capability. A throttle is really not necessary but I would suggest a fuel cut-off so that you can return to the beach without running the boat up on the sand under power. The Short Stuff would probably be more fun if you purchased a water cooled R/C 10 size motor. You will get more speed and have a throttle capability.

★

Well, that about does it for another month. Send your questions, comments, race results, etc., to the address at the end of this column. If you desire an answer before magazine publication, enclose a self addressed stamped envelope so I may answer your letter by return mail.

Howard Power, Hobbies Unlimited, 766 Broadway, Seaside, California 93955. (408) 394-1200.

□

CUNNINGHAM ON R/C

from page 25/24

ribs snap when you're trying to fit them into place while constructing the wing. Lite ply has become widely used in model work, but is it really that much stronger than good straight grained balsa? Probably not. Try breaking a piece of 1/8" thick lite ply. Cut a piece about 6" long, 1/2" wide, and 1/8" thick. Cut a similar piece of hard straight grained balsa. Snap each in two. You will find that in many cases the lite ply isn't even as strong as a good piece of balsa. Sure, it's a lot stronger than a light, pithy piece of balsa. You have to really analyze the structure that you're building, as well as the wood that is to be used in this structure, if strength of the finished product is a necessity.

★

Speaking of balsa wood, cutting it out, or selecting it for a purpose, brings to mind a letter that I received

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the other day from Phil Davis. I think that Phil had his tongue firmly embedded in his cheek, but way deep down is a pretty good thought.

Surveying the new scrap piles of balsa over my 5th glass of Chablis, wondering what I'd do with just-ordered plans for a "Hooker" that I wanted to enlarge for a brand new Max .90, I was almost ready for a new house fire. "Why," came the bitter thought, don't all of the plans people market partial kits to go with the plans? Obviously, the cost of dies (for die-crunching) or hand-cutting would be prohibitive, especially when the market might be for only a handful of "kits."

Then, while pouring another draught of Inglenook grape juice, my attention turned to a recent article on hi-tech development, robotics. "The Chip," lasers, etc. As a long-time science fiction reader, my "creative thought process" began to function. What came out of that "brain storm" is the subject of this letter. Your column in RCM seems to be the most appropriate forum, so ... why not a computer-controlled laser pattern cutter? The cut lines on plans could be read either by a visual scan or a magnetic ink process. The computer's "brain" would then direct the laser beam to cut the stacks of sheetwood with extreme accuracy for 1 or 100 "kits" at a minimum cost. The first cutter would be expensive, but it would seem to be that both the plans people and the manufacturers could utilize a time sharing arrangement to reduce individual costs. There would be no further need to tool up for new designs, production runs could more easily be matched to anticipated demand, out of production kits with renewed interest could be generated at modest cost --- the concept grew. How about including a computerized reduction/enlargement capability? Want a 1.7234% enlargement of a Guillow's Explorer? Just punch the buttons. Tapered ribs, just set the computer and let it go.

I, personally, don't have the technical capacity to accomplish much more than wiring a light switch, but I do know that the technology is available. I'm sure that there are modelers who read RCM who have the know-how, and could come up with a whole bunch of commercial applications that could well pay for the whole project. And once built, I'm sure that the Japanese would come out with a pocket sized unit for $99.50 that would operate off of a 250 mA flight

pack. This would allow the RCM plans service to provide a semi-kit for the "Hooker" at any desired ratio of size. I ask not for financial reward as the result of the revolutionary concept, only a token recognition --- like one "semi-kit" per each set of plans in the RCM catalog!

Actually, there's a bit of truth in Phil's fermented grape juice soaked brain. This type of technology is being used in major industries today to track from paper patterns or inked lines and laser cut stacks or sheets of steel. Kinda wonder, though, how you would keep a stack of balsa sheets from burning up from the heat of the lazer beam. Lasers are being used in eye surgery as well as other types of operations, so who knows, perhaps in a few years you can buy a computer controlled laser cutter that will do the job that a band saw, and hand/eye coordination can do today. I want one too when the time comes.

★

I've been hooked on the Turbulent design for the past couple of years. It has all of the good looks really required for a light plane, and builds up well into a fine flying model. As most of you know, the .40 Turbulent appeared in the September 1982 issue of RCM and, through Sky Master Industries, I have made available plans for a .60 (72" span) and a .90 (84" span) Turbulent. By the time that you read this column I should have completed plans for a Quadra sized Turbulent with 96" wingspan and 1500 square inches of wing area, and a "Turbi-Bipe," about 2000" of wing area and an 84" span biplane based upon what I think that Roger Druine would have designed if he had lived long enough to turn his cute little monoplane into a bipe. This aircraft, too, will be based on a chain saw engine, and should tip the scales at about twenty pounds or less. Both of these sets of plans will be available through Sky Master Industries and each will sell for $20.00, postage included. If you're interested, write to Sky Master.

I've decided that most builders of larger aircraft are quite at home with scratch-building, and get along quite well with just a set of plans and, since bringing out a new kit is a very expensive proposition, I will stick to bringing out plans for larger aircraft for a while.

To wind up this month, let me extend the first invitation to you to come to the Sixth Annual Southwestern Jumbo Fly-In, to be held at Thunderbird Field, just west of Fort Worth, Texas, July 16th and 17, 1983. It's going to be even bigger and better than last year, because all of you are going to make it so. □

EAGLE 63

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You are given three choices of wing. Type A or B for 4 channel, and C for 3 channel. We opted for B which has the least dihedral than A or C. We marked a big black B on each wing half on the plans; this way it would be easier to remember which wing you are building when looking for items such as dihedral jigs and other parts specifically for your wing. We particularly enjoyed the scent from the cedar arrow shafts which were used as leading edge spars.

The ply fuselage is a joy to build. Just lock all the parts together, holding in place with rubberbands and masking tape, then following instructions. Use Super Jet to lock the whole thing into a rugged, square, light fuselage. We were also impressed with the extremely neat way in which the firewall, front hatch, dashboard, windscreen and wing platform were designed to just fuse together. A lot of engineering went into this area.

In the nose area we encountered one small difficulty. You are instructed to drill four holes on a die marked line on the top surface of the breakaway plate. These holes are to pass through the hardwood engine mount beams. We drilled the holes exactly on the line, however, there was not enough clearance with the fuselage side and a part of each blind mounting nut had to be ground away. When you drill, drill just inside the line and the blind mounting nuts will clear the fuselage sides. Generally speaking, the whole plane used standard construction practices and with the extremely complete "step by step" instructions, even a beginner would have very little trouble. The whole plane can be built using Super Jet. Our kit included a coupon you can take to your dealer and purchase a 1/4 oz. bottle of Super Jet at a very reduced price.

Covering:

Three covering schemes were recommended in the instruction book. The simple Eagle and Navy schemes for the novice, and the third for the expert builder because it recommends splicing two colors of MonoKote. Since our Eaglet used the Navy scheme, we decided to go that way again. The engine compartment and breakaway plate were fuelproofed with 5-minute epoxy then sprayed with Formula U Polar White. The wing tips were sprayed with Formula U Missle Red which matches MonoKote 201 Missle Red. The rest of the plane was finished in red and white Super MonoKote. The stars and bars plus the NAVY were fabricated from trim MonoKote and

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RCM'S 1983 MONTHLY CONTEST

DO YOUR THING *with the* REAL THING MOCK TWO

This contest is for the most original/unusual modifications to the Real Thing Mock Two. Use your wildest imagination . . . and anything goes! ★ *YOU CAN WIN* ★

★ FIRST PRIZE ★

From Dremel, Division of Emerson Electric Co., 4915 Twenty First St., Racine, Wisconsin 53406:

A Dremel Delux Model 3801 Ball Bearing, Variable Speed Moto-Kit.

★ SECOND thru FIFTH PLACE ★

From House of Balsa, 20134 State Rd., Cerritos, California 90701:

A ZAP Package consisting of 6 different items (ZAP-A-GAP CA+, ZAP/CA, ZAP LOCK, ZIP KICKER, Z-7 DEBONDER, and Z-ENDS).

Entries to consist of color photo print (do not send slides) and written description detailing equipment used and modifications that were made.

Winners will be chosen each month for 12 months from entries postmarked between first day and last day of each month in 1983.

RULES

Persons not eligible:

1. Members and employees of RCM or any other model airplane publication.
2. Members and direct or indirect employees of Dremel Manufacturing Co.
3. Members and employees of any manufacturer of hobby kits, hardware or supplies.
4. Anyone engaged in the wholesale or retail distribution of hobby kits, hardware or supplies as a major source of income.

General:

1. All contest entries must be addressed to RCM REAL THING CONTEST, R/C Modeler Magazine, P.O. Box 487, Sierra Madre, California 91024.
2. All photographs and materials submitted by the contestant will become the property of R/C Modeler Magazine and none will be acknowledged or returned.
3. This contest will be null and void in any state or locality where specifically prohibited by law.

EAGLE 63

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the numbers on the tail were cut from a number and letter roll of shelf paper. They were fuelproofed and glossed with Coverite Glaskote. All trim MonoKote was edged with Glaskote to prevent bleeding.

Engine:

The RCM prototype used a K & B .40 engine with muffler. The plans show mounting instructions for the K & B, the O.S. Max .40, and the HB .40. The Sullivan 8 oz. slant tank is mounted in a bed of foam just behind the firewall. The tank compartment is covered with an easily removed hatch which we removed while filling the tank. You are able to see when the tank is full and avoid run-overs which mess up the surface of your pit area or pump your muffler full.

Radio:

Another pleasure of this kit is the large radio compartment. Our Kraft Gold Spectrum Six receiver, three KPS 24 servos, and a 500 mil. battery pack hardly dented the space in the compartment. Everything was well-wrapped in 3/4" foam. Keep the bottom of your servos close to the cabin floor. If you mount them too high, the balsa pushrods will rub on the top of the hole in former "E."

Flying:

Since the the Eagle 63 was designed as a trainer, it can fly slowly on reduced engine power and, wide open, it scoots and stunts. The Eagle 63 is a nimble fun flier and sport model that you will enjoy to the fullest.

On our first flight, we taxied out on the runway, hesitated a second and confidently gave her full throttle. She hugged the ground, and straight as an arrow she gained flying speed then seemed to spring into the air. As soon

as it was safe we backed to half then third throttle, a bit of right aileron trim was all that was necessary. After a partial tank at full throttle, a few touch and go's to see how she was going to land, we put her into the landing pattern. She floated in over the end of the runway, put all three wheels on the ground and stayed there. In fact, we have yet to make a bounce . . . bounce . . . bounce . . . landing with the Eagle 63.

A few turns of the aileron linkage squared away the necessity for aileron trim. The RCM prototype balanced exactly at the C.G. with no addition of weights. A number of similar flights have followed each one more pleasurable than the last. The few maneuvers we have put her through such as rolls, split S, Immelmans and loops, she performed beautifully --- a fantastic plane.

Conclusion:

We have found the Eagle 63 to be an excellent sport trainer, gentle enough for the novice yet sporty enough for the experienced flier. We would definitely recommend that the novice forego the ailerons and use the "C" or high dihedral wing and perhaps, some time in the future, build another wing, then the Eagle 63 becomes your aileron trainer. □

BIG IS BEAUTIFUL

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dramatically. This could be done if an older model is being recovered and it is desired to strengthen it before flying again.

The method described here in the past has been to build the gussets in during construction of the fuselage sides by gluing them in place before

the side is removed from the building board. It works and works well, but it is then necessary to shorten the cross members by the thickness of the gussets added to the **inside** of the fuselage. Putting them on the outside would allow them to show through the covering and that just isn't neat!

Notching the gussets to accommodate the cross members works equally well as far as adding strength is concerned and leaves the cross members the same length. It also permits gluing like materials together, rather than making a three layer 'sandwich' with the need to glue unlike materials together.

I use 1/32" plywood scraps from which to make the gussets and if you carefully save all such scraps, you'll have a practically limitless supply on hand all the time. I cut circles out of the plywood, and it cuts beautifully with a pair of ordinary household scissors, then slice them in half and notch to suit the material being used. This works well and makes a strong joint **along** the fuselage sides, but does not do much for the glue joints on the vertical or cross members.

The next step is to apply only half of the notched half circles to the joint which still increases the glued area

significantly. If there is a diagonal side member, this half of the original gusset is added on the side where the diagonal member lies.

I then prepare another gusset, using lite-ply scraps in the shape of a triangle about an inch long on the short sides, notch it to fit over the longeron and add it to tie the longeron, the vertical and the cross member together. If you use Hot Stuff, these gussets can be added in very short order and they add very greatly to the strength in the joints and do not increase the weight by a significant amount. I would doubt in most large models if the weight would even be detectable except with the most sensitive scales. (Most of us use the old bathroom scale or a "Not Legal For Trade" scale and they aren't all that accurate except to give us an idea what ball-park weight we are getting into, anyway!)

The photos accompanying this column show in detail just how to do this little trick and the preparation of the gussets is not onerous if you plan it carefully and cut a batch of them all at once. The resultant confidence with which you'll be able to fly your bird without a weight penalty developing

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is worth the effort and time invested in doing it.

Some joints do not lend themselves to the addition of gussets and that's where the cocktail toothpick comes into its own. The photo shows the wing tip on the Balsa USA Sopwith Pup currently on my building board. As you can see the wing tip corner is a separate piece and is glued to the rear of the leading edge and to the 1/2" x 3/8" tip material. The area being glued is not all that large and what with wing tips occasionally getting a bump or two, a little extra strength is a large plus. The cocktail toothpicks are made of a hardwood and are quite strong, so a hole drilled slightly undersized in the balsa wood will accept a glue soaked toothpick with a little gentle encouragement from a light hammer. (The hammer I use is a jewelers hammer, is quite light and comes in for a lot of this sort of use on my building board. It's also very old having been in the family for about four generations and so is not only an antique, but a bit of an heirloom as well. However, a light hammer is often available in a toy tool set and is about the right weight for this use.)

Balsa USA makes most of their wing tip and control surface edges out of two laminations of balsa sheet over an inner layer of lite ply. They are very strong and they sand to a nice finish very well. Good method and highly recommended. The addition of half of a toothpick adds greatly to the strength of a joint such as the one illustrated and again, little, if any appreciable weight is added. I put a drop of Hot Stuff Super T on the toothpick before driving it into place and haven't had one fall out yet!

Another area where significant strength increases can be gained and are well worthwhile is in landing gear joints. The usual method of binding with copper wire and soldering in place was all well and good when models weighed in at under 15 pounds. However, when our model weighs over 20 and sometimes over 30 pounds, copper wire and soft solder just won't cut it. The pictures illustrate my current method of overcoming this potential weak spot. I now bind with ordinary stove pipe wire and solder it in place with a much higher heat range silver solder. It's called silver solder but is not actually the material used in brazing. It's solder but with a heat range of around 275 to 300 degrees Celsius. It's not so high as to

require heating the gear wire red hot which would certainly change the temper and probably make the wire too soft for landing gear use as it would bend with minimal loads. (Stove pipe wire is a material which will be familiar to anyone who has lived on a farm, it's similar to baling wire and is steel but quite soft and easily wound into place. It solders well, but a torch is needed for the heat of the solder, a soldering iron won't produce sufficient heat.)

As can be seen in the photo, the wire is started in place lying between the landing gear wires and then wound over itself, which both makes a neat looking job and aids in holding the wire winding in place. The other end can be at least partially concealed by ending up on the bottom of the gear with it so it is out of sight when the model is upright.

As shown in the photo, I usually hold the two LG wires in place with a set of vise-grips while winding the wire, keeping the windings tight without having to hold the LG wires from twisting against one another while doing the winding. (Besides, it takes three hands to do that!)

Once soldered in place this way, they are going to be about as permanent as you are going to find and, if you do break them apart, you are going to have a heck of a lot more to repair than just landing gear! The method outlined produces a much more durable gear than would be the case with copper wire and ordinary solder and, once again, with a hardly discernable weight increase.

I usually paint the component parts of a model before assembling them. By this I mean particularly the empennage. It's a lot easier to do than to paint them after assembly although it is often necessary to do a little touch up after assembly. The glue joint holding the tail feathers on the fuselage is a very important one and one which is often done poorly, especially by newcomers to the hobby. It is all but imperative that you remove any paint, fabric or other material on the mating surfaces before gluing them together if you are going to have a solid, reliable glue joint, regardless of the material being glued and the glue being used. Get that all important glue joint right down to bare wood before you even think of mixing epoxy or whatever you are going to use. It just isn't worth taking the chance on not doing it right and the only right way to do it is to remove anything from between the mating surfaces but the bare wood of the assemblies being joined.

Naturally, I checked the fit of the parts before gluing them and adjust as

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necessary to obtain tail surfaces which are parallel (or vertical, as required) to the wing. Nothing looks worse (and can give you more trouble) than surfaces which are not correctly tuned to the wing. Also, at this time, check that the incidence is correct and shift or adjust as necessary to get them correct. Your model will fly better if they are as recommended on the plan.

Most large models (and full scale airplanes for that matter) require some sort of bracing between the vertical fin and the stab. Many methods have been tried to accomplish this and one with which I have had some success is the use of bicycle spokes and small electrical terminals. The terminals are soldered to the ends of the spokes, bent to the correct angle and then bolted to one another through the stab or fin. They make great braces and not having to rely on glue joints to hold them in place is great. You can get a significant amount of shake that far aft and if glued braces fall off, you might as well never have bothered to put them there in the first place.

You can, if you wish use a threaded Kwik Link with the shaft end ground off for the ends if you wish. The Kwik Link and the bicycle spoke are both threaded 2-56 so this will provide you with a very accurately adjustable strut which may still be bolted through the surface.

Spokes work well in a number of applications and I have been using motorcycle spokes in conjunction with Dubro's 4-40 ball links for pushrod ends. If you use dowel, arrow shaft or wooden pushrods, the motorcycle spoke can be adapted to the end and if you can find 4-40 threaded spokes (or thread them yourself, a 4-40 die is not expensive) or even thread whatever you do find into the Dubro ball link, you'll find you have a much more robust linkage than is the case with the more conventional materials we use on smaller models. I've also managed to find sulky spokes which are sized between bicycle and motorcycle spokes which also work well. If you have sulky racing in your area, find out who keeps the sulkys in condition and you'll probably find a source of these neat spokes as well. If they are US made, they'll probably be 4-40 thread.

When you have been working with one of the cyanoacrylates, it's pretty darn hard to avoid ending the evening

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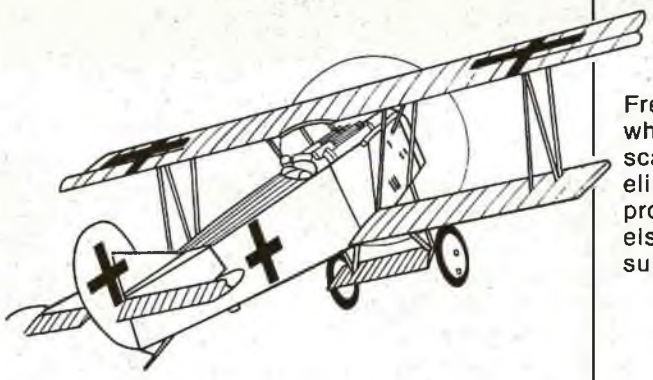

Flying Near Airports? Be Careful!

Free Flight or Radio Control flying near airports, or in any situation which might involve the possibility of models being in the vicinity of full-scale aircraft operations, must be avoided—or conducted so as to eliminate any dangerous situations. Models should not be flown in the proximity of full-scale aircraft operations unless the flyer has someone else with him for the sole purpose of watching for full-scale aircraft and supervising the flying so as to prevent accident possibilities.

PROTECT YOUR RIGHT TO FLY!

Safe Flying Is No Accident!

BIG IS BEAUTIFUL

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without some on your fingers. As you'll know, it's tough to get off and it's rather unsightly to sit around chewing your fingers until it's all gone! Pacer Technology has taken care of this problem with a non-toxic solvent labeled "Debonder." It works great! While you consider Debonder, take a look at their entire line of Zap, Zip, Kicker, etc. Very good adhesives for every purpose.

By the time you read this, those of us in the 'snow belt' will be starting to think about another flying season soon to be upon us. How many of us still put our radios away in the fall, leave them without a thought during the winter and expect them to recover from the long lay-off (without a charge) and perform their important function unfailing again all next summer? I suspect there are many who do just that and they are often victims of unexpected and unexplained radio failures which destroy or damage models for them. The unfortunate part of this is that it isn't necessary and should not happen with a little care and forethought.

I usually send my radios off to the service depot in the fall after the flying season is over **even if they have not had a problem.** A simple check-up and retune is not very expensive and, as the radios are not used much during the winter (if at all) there is no handicap being without them. I didn't do this last winter and as a result had a crash last summer and spent a good part of the summer without two of my four radios. While this is no serious loss, it was annoying not to be able to fly what I wanted when I wanted with a couple of radios away for a period of

time. How much smarter it would have been to take my own advice and have them serviced during the off season! I doubt I'll make that mistake again.

If you haven't had your radios serviced or checked for a year or more, be sure to exercise the batteries during the off season, and if necessary, send them in for a check **before** the flying season starts. You may well save yourself the trouble and anguish of a crashed model by doing so.

I use a Super Cycle (unfortunately no longer available, but there are other such devices on the market by L.R. Taylor & Co., and Ace R/C) and cycle my batteries, both flight and TX about every six weeks. I keep a log of the charge and discharge times and which packs were done at what time and it seems to keep my radios and their all important batteries at peak performance. It doesn't take long and is no real problem to do. I use one of the readily available light timers to stop the charge after the appropriate length of time which saves having to be there all the time to take the charge off as required. Normally I'll charge them all in turn over a few days until they have all been done and then put them away again until the six week period has passed and then repeat the cycle.

It has an added advantage that, if I am installing a radio in a new model during the winter construction season, the radios are all charged and ready for use when I need them rather than having to wait until I recharge before I can check the operation of controls in that new model.

Those of you who live far enough south to safely ignore winter (or who don't even know what winter is!) can still cycle your batteries from time to time when radios are not in active use and will find it to be a well worthwhile exercise. It's also a good idea to keep track of the age of your battery packs

and replace them after a few years use. Better to go to the expense of changing batteries prior to failure than having to do it anyway after a model has been destroyed, bringing to your attention that you should have done so sooner! Flying safely includes care for your equipment. □

ENGINE CLINIC

from page 13/12

breaking a prop, or worse, as you have found out.

You would not accomplish very much trying to break an engine in by spinning over with the glow plug removed. The engine is not under load, up to temperature that causes parts to expand, etc. Any break-in should be with the motor running. It is the expansion and contraction of parts under operating load and at operating temperature that determines break-in.

There are naturally some exceptions but these are best left to people more experienced with model engines. My good friend, the late Hi Johnson, when producing the Johnson engines used to apply a special lapping compound to the engine and then spin them with an electric motor with the glow plug removed to lap the piston and sleeve together. Hi and I had different points of view as to whether this was good or bad.

Something that will help start a new engine is the use of a larger diameter propeller for the extra flywheel action. Use an inch or so larger diameter but with lower pitch than what might normally be used for flying. After the first few initial starts and the needle setting has been found, then use the recommended prop.

Dear Mr. Lee;

I am building a Pica Products Waco F-3 biplane that will be powered by a K & B .61. The engine will be cowled-in with a dummy engine placed in front of it, so the air flow through the cowl will be somewhat restricted. Exhaust gases will be routed out of the cowling via a Slim Line Products exhaust manifold and silicone tubes (two tubes about 4" long each). Since I live in Florida where the summertime temperature is in the 90's and very humid I believe that keeping the temperature within the cowl down would be beneficial. Will wrapping the exhaust manifold with asbestos, or similar, help keep the temperature down? Will this affect engine performance? What about engine life? The plane will weigh about 8 lbs., and the fuel used will never exceed 10% nitro. Since the manifold will be

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insulated, will this cause the engine to run hotter? Any light that you can shed on the subject will be greatly appreciated.

Sincerely,
Peter Stanisavljevich
St. Petersburg, Florida

Wrapping the exhaust manifold with asbestos might keep a little of the heat from radiating inside the cowl but would only increase the operating temperature of the engine. In the long run you would not be gaining anything.

It would be best to rig a couple of air ducts leading air directly to the cylinder and over the head with plenty of air exit area. Close off all space on either side of cylinder so that all air entering the cowl has to go through the fins — not just pass around. The use of a castor oil based fuel will help the engine run a little cooler than fuels that contain synthetic oils and be careful about lean runs.

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Dear Clarence,

Re your answer to Henry E. Boelter, Jr., of Homer, Alaska, and cold weather starting.

You say that choking the engine at temperatures lower than 20° F is of no use as it will lay in the case with none reaching the combustion chamber . . . until the engine is flooded. An exhaust prime is the only way.

(1.) I must take to task all of the columnists who suggest such a way. ***Do they forget that we are now flying with mufflers,*** *and many do not allow proper priming via that route? Furthermore, all of the prime will stay in the exhaust stack, as there is hardly enough to pass over the cylinder liner, and if more is flushed there then one will really get a hydraulic lock. It is mighty uncomfortable for cold, if not frozen fingers.*

(2.) In cold temperatures, even if the starting procedure is more finicky, more exact priming must be done, and the only way I have discovered through the years is: (a) With carb open, fully choke to draw the fuel to the carb but no more. (b) With any device that will allow counting of drops (a piece of fuel tubing or syringe) drop in from 8 to 12 drops for a .60 into the carb, then flip vigorously to wet the engine bearings and piston to the sleeve, so that the engine feels like a hot start in the warmer temperatures. Close the carb to full idle and with a good battery that will make the plug glow bright red. That last part is important as the coldness of the engine will prevent the plug from heating up to temp., and a dull red plug once on the engine will hardly glow, and if more fuel is inserted into the upper chamber one might get quite a blow on the fingers, and that really hurts.

(3.) After start, let the engine warm up at idle. If you don't, as soon as one opens the throttle the engine might stop. If the temperature is colder the 10°F., a baffle in front of or over the carb intake is almost a must, to sort of supply carb heat.

As for my experience in the matter — I have made it a must for the last 20 years to fly on January 1st, and as much as possible after that. I have flown in temperatures that were anywhere from 40°F down to −15°F, and I have had 15 consecutive 1st of January flights and all with bare

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hands. I don't like the feel of the sticks with gloved hands.

Around here we fly regularly as long as it is sunny, and the mercury doesn't go down to plus 10°F.

(4.) Even in the summertime we always choke and drop some fuel in the carb (4 to 8 drops for a .60, less for a .40). Starts are ***always*** *in one or two flips.*

I have experimented with fuel heating systems from the fuel tank to the carb — wrapping the fuel line a few turns around the engine; and isolating the engine bay; it did not seem to make things better. As the fuel got to the metering, it seemed to cool down enough to stop flowing or slow down, so the solution to the problem was ***open up the needle valve*** *a lot more to allow the cold fuel to flow as is. The colder it is, the more sensitive the engine is to needle valve settings, as the margin between rich and just right, in cold temperatures is* ***very, very narrow.***

What is correct on the ground level is sometimes too rich in the air and sometimes too lean. Muffler pressure doesn't seem to make any difference.

Knowing what to do, now I hardly ever drop fuel in the carb. I just choke, and with the carb open I flip until the engine is wet, close the carb to idle, connect battery, and in 2 to 3 flips I am away.

But taking off from fluffy snow and seeing the tracks of the skis, and the gentle touch down and again of the tracks of the skis as one taxis back to the car, is a feeling that makes it all worth the drawbacks of cold temperature flying.

Regards,
Ray Gareau
Laval, Quebec

Ray, you must bear in mind that what works for someone proficient and experienced at starting an engine in cold weather might not work as well for a beginner. Most beginners just keep choking until the case is fully loaded with fuel — the engine kicks transferring the fuel to the combustion chamber — and the engine is badly flooded. A small exhaust prime and a few drops down the carburetor will solve the flooding. It will work every time — even for a beginner. Although not mentioned in my answer to Mr. Boelter, I have suggested many times in past articles

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that if the engine is muffler equipped to remove the glow plug and place a few drops directly through the glow plug hole. I should have mentioned this in my answer to Mr. Boelter but negelected to do so. Thanks for sharing your cold weather starting techniques with us. □

SOARING

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landing. I've never heard of the idea before but when I 'splained it to Colonel Thacker, at the Visalia Fall Soaring Festival, he said, "I've got one hanging in my garage." Which only proves that either there's nothing new under the sun or; no matter what you say, the Colonel can top it.

A new design was seen at the NWSS Tourney, the Dodgson "Windsong." This has a 134" sheeted foam core wing with an Eppler 214 airfoil. Instead of spoilers, both ailerons flip up, as seen in the photo, adding drag without changing pitch. The ailerons continue to wiggle, for roll control. The high aspect ratio of the wing makes for a very efficient ship. I was impressed with the flying characteristics. It floated around the sky like a blimp, though Bob may have filled the wings with hydrogen.

Prior to the contest, Dave Johnson, from Portland, Oregon was awarded an RTF Primary Glider Kit, which turned out to be a rock, complete with launching hook.

During my Northwest swing I also attended the Redmond Roundup, which was a soaring event held in Redmond, Washington, just East of Seattle. This gave me a chance to renew old friendships and get a preview of the aircraft to be flown at the NWSS Tournament the following weekend. Following these two Northwest contests I drove down to Visalia, California, for the Fall Soaring Festival the following weekend. Boy, after three straight two day weekends of contests I was ready for something else.

The Fall Soaring Festival has to be the most humongous contest in the world. The original sheet said they were going to limit the entries to 100. They finally accepted 130 and turned away another 30. There were a few no-shows but I think the final roster listed over 120 fliers. It is put on each year by the Central Valley Radio Controllers, and is held in Visalia, in

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the center of California; just North of Pixley and Southeast of Firebaugh. That should pinpoint the location. Those CVRC guys are so organized its frightening; they even had call-up sheets for the Portapotties. They have their own grass field with roped off staging and contestant areas.

The tasks at both the NWSS Tournament and the Fall Festival were a bit out of the ordinary and were interesting. NWSS had a day and half of 5 minute Precision/Duration. Landings were on a 25' line with points awarded according to the distance either side of the line to the nose of the ship. At 11 a.m. Sunday they ran a throw-away round. Fliers could re-fly any one of their previous rounds and the re-flight score was the one that counted. The top ten then flew 5 rounds, alternating 3 and 5 minute Precision/Duration for the Championship. The re-flight decision was an interesting twist. How many times have you wished you could re-fly one round in a contest, well, here was your opportunity. At least one flier re-flew himself right out of the top 10, and a couple re-flew themselves to the finals.

The Fall Soaring Festival was a pure precision event. Two days of 4 minute precision. Your score was 900 points minus the square of your error. That is, if you were 4 seconds off, either way, 16 points were deducted; 10 seconds lost 100 points and 30 seconds blew the whole 900. In addition, fliers were required to fly through two fiberglass pole gates and land in a 50' x 100' qualifying area. Once through the gates, no turns were permitted. If you didn't land in the qualifying area — no flight points. Each day the scoring computer threw out the lowest score. As you can imagine the scores were pretty high. After the first round, 16 fliers were tied for 1st place, with perfect scores. I came in 5 seconds over and was in 28th place. As things went on, the less precise fell by the wayside. The last flight on Sunday included a precision landing in a graduated 25' circle to separate the sheep from the goats.

Anyway, I won't tell you who won; the purpose of all this is to tell about types of contests and stuff like that, not who won. Besides, I don't know who won I had to leave Sunday morning. Anyway — the guys who won know who they are.

Catch you next month, all being well. Howzat! □

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Poolboy went back up just high enough (about 8") to clear the edge of the dock and come to rest on the dock!

Lots of applause, and I went over, picked up the Poolboy, polished my fingernails on my chest, inspected them ostentatiously, and walked up to the display area as much as to imply, "Ho-hum, that's the way I do it all the time!" But I didn't fly again. "Gotta let the other guys have some air time, y'know." Sure.

The following morning, we gave another demonstration, and naturally, I had to fly the Poolboy again. So I did. The flight was great; then, when the engine quit, I once again tried to position the model so it would coast back to the dock. Only this time there was a slight cross wind. As the model came in, looking good, the slight cross wind drifted it smack into a head-on collision with a mooring post. Parts flew in every direction. No problem; they'd float. So I went over to pick them up, and it was only then that the horrible truth was evident. All the parts were floating except the precious little .010 engine. The impact had knocked it free from the balsa fairing behind the firewall, which was supposed to keep the engine afloat, and the .010 was on the bottom of Clear Lake. Blast! How stupid can you be, Chief Dum-dum? You just set a new record! I was furious with myself for being such a show-off, with the result that I had lost one of my prized possessions.

What to do? Well, the water was only about 4' deep, but so merky that you couldn't see more than 3" (Clear Lake is one of the most misnamed lakes in California, if not in the world. Maybe one day they'll find a way to really clear it up).

My friend Tom Baker, who also flies small seaplanes, volunteered to go in and feel around the bottom with his bare feet to see if he could locate the engine. After about 45 minutes, we decided it was useless, and gave up.

Not so, though, with my friend Chuck Connor. He said, "Hey, tomorrow I'll come down here with a magnet I have and see what I can do." I thanked him for the offer, but had little hope for the results.

How wrong you can be when you're discouraged. About a week later, after I had gone home and given up on the whole deal, this letter came in the mail:

Log of Recovery Ship Kayot I
Chuck Connor Capt.
Margaret Connor 1st Mate

Oct. 5, 13:20: As we went north along the shore of Clear Lake, we noticed at the Lucky Four Outpost a group of natives flying from the dock.

The two pilots Rinker and Cheuvront reported that everything was going fine.

14:05: Arrived at the Skylark Outpost, dropped anchor and proceeded to probe for missing engine. First Mate Margaret reported that Lowell Cheuvront had arrived to help in the search.

We had to watch the natives as they wanted to know what we were doing. After the First Mate assured them that all was all right they left.

15:18: After many attempts with the magnetic probes with failure, we were about to give up. We had a deck full of metallic trash from the bottom.

16:45 With food and water exhausted and just enough fuel to get back to home port, we decided to try a few more probes and head back.

16:55: Mr. Cheuvront reported that he had contacted something. When he pulled up the probe, there was the engine in tact.

17:20: Recovery ship returned to dock. We removed the engine for tear down and overhaul.

We took the engine to the Eagle Aircraft Co., for overhaul. This company was started in Warrensburg, Missouri, in about 1936 and has moved around the county at several locations. It is located at Lakeport, California, at this time, and is run by Margaret and Chuck Connor.

The engine was found to be in very good shape except that the carb boss was cracked so a brass ring was installed. I think it's as good as new. The engine was torn completely down and dried out, and oiled.

We are glad that we could help, and drop in to see us when you are at the lake.

Sincerely yours,
Margaret & Chuck Connor
Lakeport, California

I think you'll have to agree with me that this event is definitely one for the books, as they say. Especially the clever way that Chuck wrote up the log of the recovery mission.

Many of you may be unfamiliar with the type of recovery ship, the "Kayot I" which was used. With that in mind, I asked Chuck to send me a photo. See Photo 1.

Trett Bishop, the well-known professional photographer in Lakeport, took the photo of Chuck (on the left), Lowell Cheuvront (middle), and Margaret Conner at the helm. This was taken a few days after the recovery mission, so obviously they survived all of the pitfalls the natives put in front of them!

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SUNDAY FLIER

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One more thing. Chuck refers to the repairs to the .010 done at the "Eagle Aircraft Co." In particular, the installation of a fitted brass ring on the carburetor boss. Here's a closeup of the only .010 in existence with a brass ring reinforcing the carburetor. See Photo 2.

Now that's precision machine work. And the Poolboy is all repaired and flying again. Here it is, floating in the pool during a leakage test of the hull. See Photo 3.

Now you know what I mean when I said there has to be a patron saint who takes pity on all of us Dum-dums --- Chief Dum-dum in particular.

So --- all of you Sunday fliers who are of a mind to bare your souls in return for some pittance of a reward (I'm gonna try to get something different, unusual, and worth admitting that you're dumb enough to win it) --- rack your brains --- that's rack, not wreck --- and tell me what you did that is dumber than anything else I might hear about. Never mind the old standbys --- leaving the wing at home, forgetting to charge the batteries, or charging them in reverse, or putting on one rubberband to hold the wing, etc. You gotta come up with something really different. And, if it's funny, so much the better. Just once again --- don't come up with an incident where you thought you were the greatest, only to find out that you aren't, because it's been done.

I know, I did it.

So tell us what you did. Somebody's going to win the prize, and it might as well be you. □

FROM THE SHOP

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accepted by the FCC. Otherwise, the crystal and other accompanying frequency determining components must be exchanged in a module form.

The approval of the new R/C channels is a significant milestone in the progress of our R/C sport/hobby and we at RCM extend our congratulations and gratitude to the dedicated people who served long and hard to achieve this most beneficial concession.

★

Gotta get back to the workbench, lots of neat things to do. See ya next month. □