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This Month's Cover

Miss Karen Godwin, a Seagal cheerleader with the Seattle Seahawks pro football team, fulfills the glamour duties for our cover. Karen is also a student pilot working on her private license. She is displaying a Goldberg Skylark, beautifully built by Vick Reynolds. The Skylark is equipped with a Futaba radio and is powered by a Super Tigre .40 engine. Ektachrome transparency by Dave Pierce, KIRO TV, Seattle, Washington.

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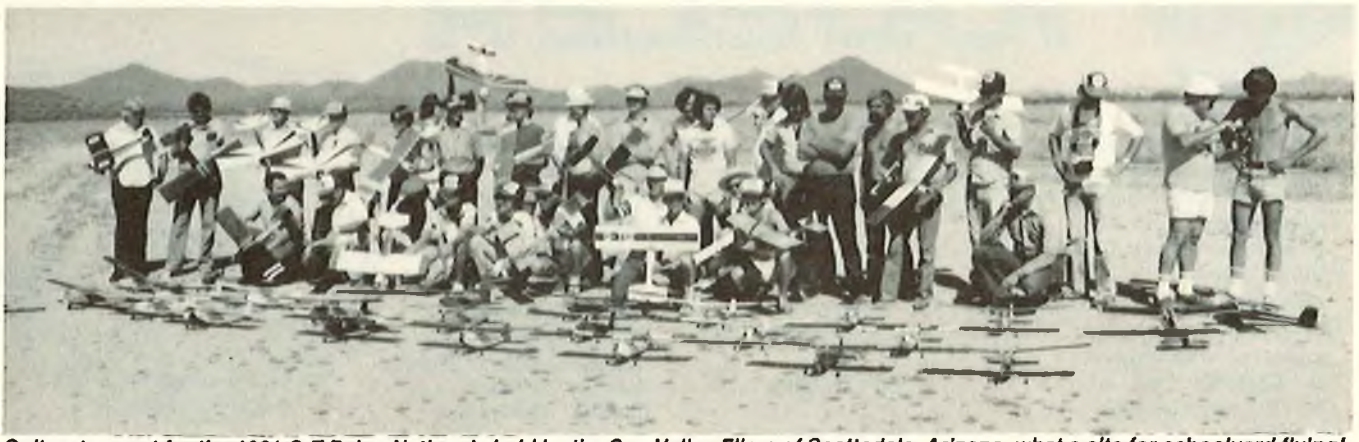
FROM THE SHOP

Don Dewey



Quite a turn out for the 1981 Q-T Pylon Nationals held by the Sun Valley Fliers of Scottsdale, Arizona, what a site for schoolyard flying!

A train of thoughts were triggered by a paragraph by Ralph Moore in the Dope Bucket, newsletter of the Utah State Aeromodelers, Inc., Laron R. Huddleston, editor.

The dedication of those few who flew and participated in the 22nd Annual Air Show demonstrated real loyalty and love for the sport. The weather was wet, windy and coolis-hh. Saturday, the first day of the contest, the wind blew us a mile or two, or maybe more, downwind. Sunday, it rained off and on all day. This is the first time I ever flew a free flight in rain and watched it thermal and at the same time have the covering literally come off the frame so the ribs were exposed --- "put some dope on your bomb you dumb cluck --- they fly better in the rain." Nevertheless, there was some great flying done and we enjoyed ourselves.

This brought back fond memories of bygone days before our involvement with radio control. In retrospect, everything was more simple and easy-going, not only modeling, but living in general. The enjoyment of all-balsa hand launched glider contests will remain in our minds forever.

Sometimes, in this sophisticated world of modeling, we are inclined to overlook the pleasure that can be derived from the more simple models. It looks like we are talking ourselves into stuffing a radio into one of the simple fun ships in the back room and go fun flying. Maybe it will be more simple to get one of the guys in the office to install the radio for me. Hmmm . . .

☆ ☆ ☆

Irv Allison of Boca Raton, Florida, sent in the following brain twister, see if you can solve it:

Several modelers each had a scale plane.

Andy helped the Waco pilot learn to fly. Jerry was taller than Bill. Ed's sister was engaged to the Pitts' pilot. The ME-109 pilot was taller than the Starduster pilot. Harry and the P-51 pilot lived in the same building. Paul and Allen each won $20 from the J-3 pilot at pinochle. Ed, the DC-3 pilot, the ME-109 pilot and the Starduster pilot enjoyed playing poker together. The J-3 pilot's wife was the P-51 pilot's sister. The J-3, Waco, Corsair, Pitts, P-51 and Spitfire pilots except Allen, Harry and Andy are shorter than Sam. Paul, Andy and the Spitfire pilot lost $150 each at the racetrack. Jerry and Bill were heavier than the P-51 pilot. Paul, Harry, Bill and the Waco pilot lost to the Pitts' pilot at pool. Sam was undergoing a divorce suit. The Waco and P-51 pilots each had 2 children. Ed, Paul, Jerry and the Starduster and ME-109 pilots were bachelors. The others were married. The Spitfire and P-51 pilots and Bill each won $100 at the fights. One of the DC-3, ME-109 or Starduster pilots was either Mike or Andy and Mike was shorter than Bill.

With these facts, determine the name of the pilot of each plane.

The answers will be found elsewhere in this issue.

☆ ☆ ☆

Here is a report of a heartwarming incident by Dan Speranzo, editor, SIM Pulse, newsletter of the Staten Island Modelers:

This past Sunday afternoon while a few members and myself were at the field, a man and his son pulled into the pit area and pulled a small plane out of the trunk of their car. Upon closer inspection, it turned out to be a 1/2A Fomie, 2 channel, rudder and elevator. They approached us and asked if we could fly their little plane. It was chilly and windy, but Dom gave it the once over, a little rough around the edges, but airworthy. Doc produced his 1/2A starter, the wing was banded on and after a few tries, .049 cubes come to life. A stiff toss into a heavy headwind and the tiny plane rose. It didn't fly, it just hung in the breeze, airspeed matching windspeed. Slightly upwind and 50 feet off the deck the bee in the nose goes silent. Dom rolls downwind back over the field and as the tiny bird skitters onto the turf, she loses a wheel from the main gear.

Lying on her back from the small ground loop, the tiny bird is silent. The small boy is a different story, "Dad, it flew! It flew, I can't believe it!" Ever see a 3 mile smile? The little boy was smiling so hard I'm surprised his ears didn't hurt. After a few suggestions on how to improve his plane, the father and his son, still smiling, packed up and left. We never got their names, but they'll be back, smiles like that last a long time. Dom still smiles when he thinks about it, come to think of it, so do I.

☆ ☆ ☆

We picked up the following exchange from the Titan Tabloid, newsletter of North Texas Miniature Aircraft Association, Al Alman, editor:

Dear Tabloid:

I used to chuckle at little things like guys taking off with their ailerons reversed or trying to fly without their transmitter.

But I don't chuckle much anymore because the top wing on my prototype #1 Lazy Ace came loose in the middle of a loop . . . and the plane went boom.

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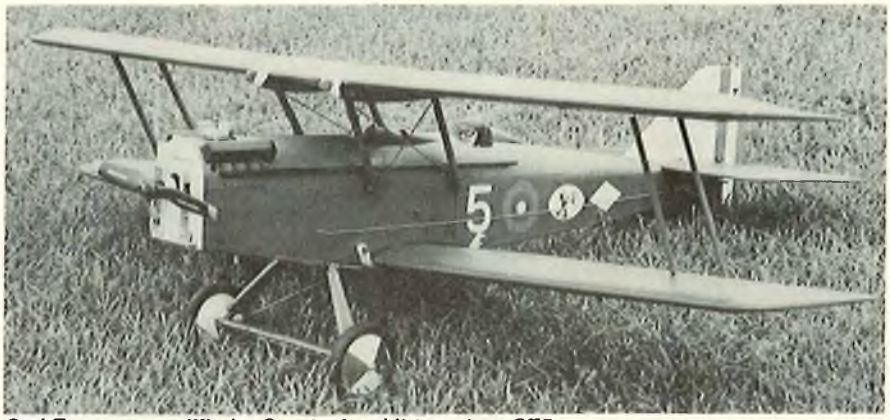
CUNNINGHAM ON R/C

Chuck Cunningham

Chuck's latest semi-biggie 28% Stand Off Scale Druine Turbulent., H.B. .60 power, 6' wingspan.

Guy Clapshaw's Bucker Jungmeister from an Aero Master kit.

I have just finished my latest aircraft, a 28% size Stand-Off Scale of the beautiful French light plane designed by Roger Druine, the Turbulent. The full-size aircraft is so small that at 28% size the wingspan comes out to a nice 6'. Power for this pretty little bird is an HB PDP .61 engine which hauls her very sprightly around the sky. The aircraft was designed and built in just fourteen days, which is no big deal since it doesn't take MonoKote any time to dry, and all of the glue joints were made with Super T. But, in building the Turbulent, I began to think once more just how much fun and satisfaction it is to take a full-size design that you want to copy (more or less) and reduce it to balsa wood, build it, cover it, then to take it out to test fly.



Carl Tuveson modified a Sporty Ace kit to get an SE5.

If everything goes okay and Murphy's Law doesn't reach up and bite you in the seat of your pants, the test flights are the end of one dream and the beginning of another. This is a thrill so great that I keep wishing that more of you would give it a try. Everyone who has seen the Turbulent wants one like it. This is fine, but everyone wants a kit of it. Since bringing a new kit to the market is very time consuming and expensive, many good airplanes go unkitted, and uncopied. I promised a rough set of plans to one of my flying friends, but the thing that he stumbled over was in cutting out the ribs. I'm sure that most modelers, perhaps 96% build only from kits, and never attempt building from magazine plans, or from their own designs. Let's examine this just a bit, or at least one more time, to see

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Jim Preston's customized Kadet & Kaveller kits.

from page 6

South Jersey Fly Away's club one plane contest entrants — all modified Balsa USA Phaetons.

how easy it really is to scale down your own dream ship, and a couple of easy ways to make wing ribs and bulkheads once you have the plans. At some time in the near future, I'll once again give you the full course of "R/C Design Made Easy," but for now, let's take the Turbulent as an example to see just how to go about scaling your favorite aircraft. I'm speaking of Stand-Off Scale, so that you can change a few things here and there to make a better flying model.

The first decision that you must make is what size aircraft you want to build. For me, that's a pretty simple choice. I like larger models; I simply like the looks both on the ground and in the air. Just a couple of months ago I designed and built a Quadra powered Flybaby, but this aircraft I wanted to fly with a .61. I was shooting for a finished weight of 8 to 9 lbs., and wing loading of around 23 ounces per square foot. A loading that would allow the .61 to pull nicely, yet not fly too fast or fly doggy, requiring the addition of a .90 engine to make it work. With these thoughts in mind, I decided that a 72" wingspan would give me what I wanted.

A look at the Turbulent specs showed that the span of the full-size aircraft is 21'-7". Dividing the desired span of 6' by the full-size span of 21'-7" gave me a ratio of .278% of full-size. Rounded off at 28% gave me the math tool to develop all of the other parts of the aircraft. The wing chord of the full-size aircraft is 3'-9" so applying 28% to this, yielded a chord of 1.09'. Heck, call it 1' and you have a very classic R/C size wing of 72" span x 12" chord. Everything else from there on is duck soup. If you have any type of scale drawings of the bird you want to duplicate, simply use the scale bar on the drawings, measure the various components sizes for full scale, multiply by your scale factor, in this case 28%, draw up the resulting aircraft, and you've got your winter building project. In the case of the Turbulent, I made the horizontal stab a bit larger, keeping the same ratio between stab span to stab chord so that the finished project would look the same. I always like to have the horizontal stab to be about 22% of the total wing area.

The weight of the Turbulent ready to fly, less fuel, turned out to be 8.5 lbs., right in the middle of the size I was shooting for. The finished product flies great, the wing airfoil is the same 20% thickness that I developed for the Hooker (RCM Oct. '81) and has proven once again to be a very super airfoil. The point really isn't how happy I am with the Turbulent, but rather how much fun and satisfaction it is to bring a dream ship from the small pages of a magazine to a beautiful flying machine. You really should give it a try. You will really enjoy it.

Now, to talk about building wing ribs, either with powered tools or simply with a razor blade or an X-Acto knife. If you're using a blade to liberate the rib outline from the piece of sheet wood, the first step is to make a master rib. The easiest way is to print the wing rib from the plan with a copy machine. The next way is to tape a piece of drafting paper, or thin typing paper over the plans and trace the rib outline with pencil. Make sure that you get it right. If you're undecided what rib to use, then borrow the airfoil from the last aircraft that you built that was an enjoyable flying aircraft for you. Take the traced out rib pattern, and glue it to a piece of sheet balsa using an office supply type of glue, rubber cement, or a glue stick. Carefully cut out this rib outline with a sharp razor blade, and carefully sand it to the finished shape.

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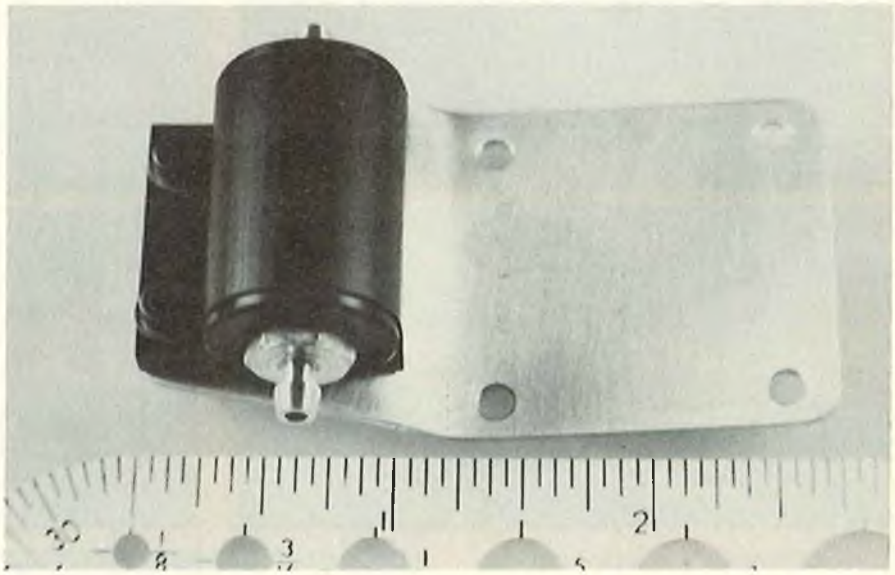
ENGINE CLINIC

Clarence Lee

Due to our friendship of many years with John Perry we have always been the first to tell you of new products originating from Perry Aeromotive. You first read about the Perry carburetor, Perry pump, Perry Directional Porting (PDP), and, most recently, the new Perry In Flight Mixture Control Carburetor here in Engine Clinic.

This past month I have been conducting tests on another new product to be released soon by Perry Aeromotive. The old Perry pump is to be replaced by a new unit that is actually a combination fuel pump and fuel injector unit. However, for all practical purposes, the majority of fellows will just consider it a replacement for the present pump. What makes the new pump different from the old one is that it does not have to be a part of the engine depending on variation in crankcase pressure (up and down stroke of the piston) for operation. For most applications the new pump will mount to the back of the engine using the crankcase bolts, however, this is not a necessity. It can also be mounted separate from the engine (if the application requires it) on the firewall, under the engine, etc. The main thing is that it does have to be mounted within the propeller arc and 90° to the crankshaft. This is due to the fact that John Perry has found a use for engine vibration that has been a curse to all models using model engines since day one. The new Perry injection pump operates from vibration. The pump, itself, is the ultimate in simplicity containing only one moving part — a cylindrical brass cylinder that is supported within a plastic housing by two silicon rubber washers. Engine vibration causes a very small back and forth movement of the brass cylinder or plunger — actually only .004"-.005". Two one way valves allow the movement in one direction to pull fuel into the pump body and the movement in the other direction forces it out to the engine carburetor. This is where the fuel injection comes in. Every time the engine fires, the pump shoots a small amount of fuel. Although you will adjust the carburetor mixture in the conventional manner with the needle valve, a fixed jet could actually be used in place of the needle valve and mixture control adjusted by use of the pump output adjustment.



Two things govern the amount of fuel supplied to the engine. As engine speed is increased, so are the power impulses and, in turn, the output of the pump injector. This takes care of the higher fuel requirements at high rpm. The pump also contains a very simple regulation system that allows for variation in fuel level throughout the flight and as the tank empties. This is accomplished by another silicon rubber washer that compresses as the vibrating actuating plunger reaches full travel. With a full tank of fuel, the plunger requires little movement to pull fuel from the tank. As the fuel head (or if you visualize a column of fuel) drops, the plunger has to work harder and compresses the regulator washer further. This, in turn, increases the movement of the plunger increasing the amount of fuel supplied to the engine. This new injection pump with a minimum of parts seems almost too simple to work, but work it does. However, as simple as the finished product appears, it took hundreds of hours of trial and error to come up with the proper proportions, rubber hardness and thickness, etc. This unit has been under development for several years now. In fact, the injection pump pictured is a prototype model and there will still be final modifications to the production version.

Many of you are probably wondering just how much fuel a small pump can supply when actuated by vibration, particularly when the actuating plunger only moves a few thousandths of an inch. This will depend on the displacement of the engine. A .60 size engine having a stronger power impulse will deliver more fuel than a .19 size engine. This, in turn, makes a single pump adaptable to any size engine. A .60 size engine running at full throttle will cause the pump to put out 10-12 ounces of fuel a minute. Most .60's gulp one to two ounces of fuel a minute so you can see the injection pump delivery is more than adequate. At the time of this writing, John was conducting some high rpm and destruction or, should I say, longevity tests on the new unit. A K & B 3.5 was being run at 30,000 rpm and at this rpm the injection pump was delivering 2½ oz. per minute. Actually, I think this would be more of a longevity test of the engine at this rpm. We will let you know in a later column how long the engine ran at this rpm.

The pump need not only be used to supply fuel to the engine. If some of you guys want to play around with water cooling, it will pump water as well as fuel. Some of us have played with water cooling using marine heads on the Formula I pylon models with considerable increase in rpm. The cooler running head stops detonation which results in an increase in power. This is an idea that Johnny Brodbeck Jr., of K & B/Cox, came up with some years back that several fellows have experimented with but no real development has followed. It is a field to be examined further.

The new injection pump can be used on engines from .15 through the 1/4

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ENGINE CLINIC

from page 12

Scale sizes. One word of caution here, however — the unit cannot be used with gasoline fuels. As many of you have probably found out the hard way, when using gasoline you cannot use silicon rubber fuel line. The same thing with the Perry injection pump — having silicon rubber valves it cannot be used with gasoline. John says he will be working on a gasoline version as well as a smaller overall size for the smaller displacement engines in the near future.

Unlike the previous Perry pump that was only intended to be used in conjunction with the Perry pump carburetor, the new Perry injection pump can be used with any make of carburetor. This, in itself, will be an appealing feature to many of you wishing to use other makes of carburetors.

One thing I liked when first starting to test the new unit was the starting ease. As those of you who have used engines equipped with the old Perry pump know, it was very easy to flood the engine. Every flip of the prop shot fuel into the carburetor and, if you did not have the engine running in two or three flips, the fuel line had to be pinched to prevent further flooding. Not so with the new unit. You choke the engine in the conventional manner which draws fuel through the injection pump. However, the injection pump does not start supplying fuel until the engine starts running. Starting is the same as with a non-pump equipped engine.

The injection pump is tentatively priced at $19.95 and will come complete with mounting plate for backplate mounting on the more popular makes of engines. If a Perry carburetor is available for a particular make of engine, there will also be an injection pump with mounting plate available. If you happen to have a make of engine for which no plate is available you can always make your own or bolt the injection pump to the firewall or any other convenient place.

I believe that about covers the more important aspects of this new unit. The release date has not been set at the time of this writing but should follow shortly after you read this article. So keep in touch with your friendly hobby dealer. I am sure you will want to give one a try.

Dear Mr. Lee,

A recently purchased K & B .40 R/C engine (#8011) showed extensive con rod wear and wrist pin to piston 'slop' after only thirty minutes of running time. The engine was run on mild fuel, a 10/6 prop, and was never run lean. Several club members here have had similar problems with this engine lately. Did K & B have a bad production run and, if so, are they doing anything about it?

Since we're on the subject, do you know if K & B plans to put bushings in both ends of their .40 size con rods soon?

Phillip M. Nickell
Longmont, Colorado

The upper end of the connecting rod and wrist pin holes in the piston are weak points in the K & B .40. However, life expectancy should be far in excess of 30 minutes. Three things will accelerate the wear. Lean running, low oil content fuel, and ingestion of dirt or foreign matter. Many times fellows will think they are running the engine rich enough because they see a smoke trail but this does not necessarily mean the engine is actually rich enough. A properly set engine will crack rich at the bottom of loops, long dives, etc. If it screams flat out the whole flight, it is running too lean and this is the way most fellows seem to set their engines.

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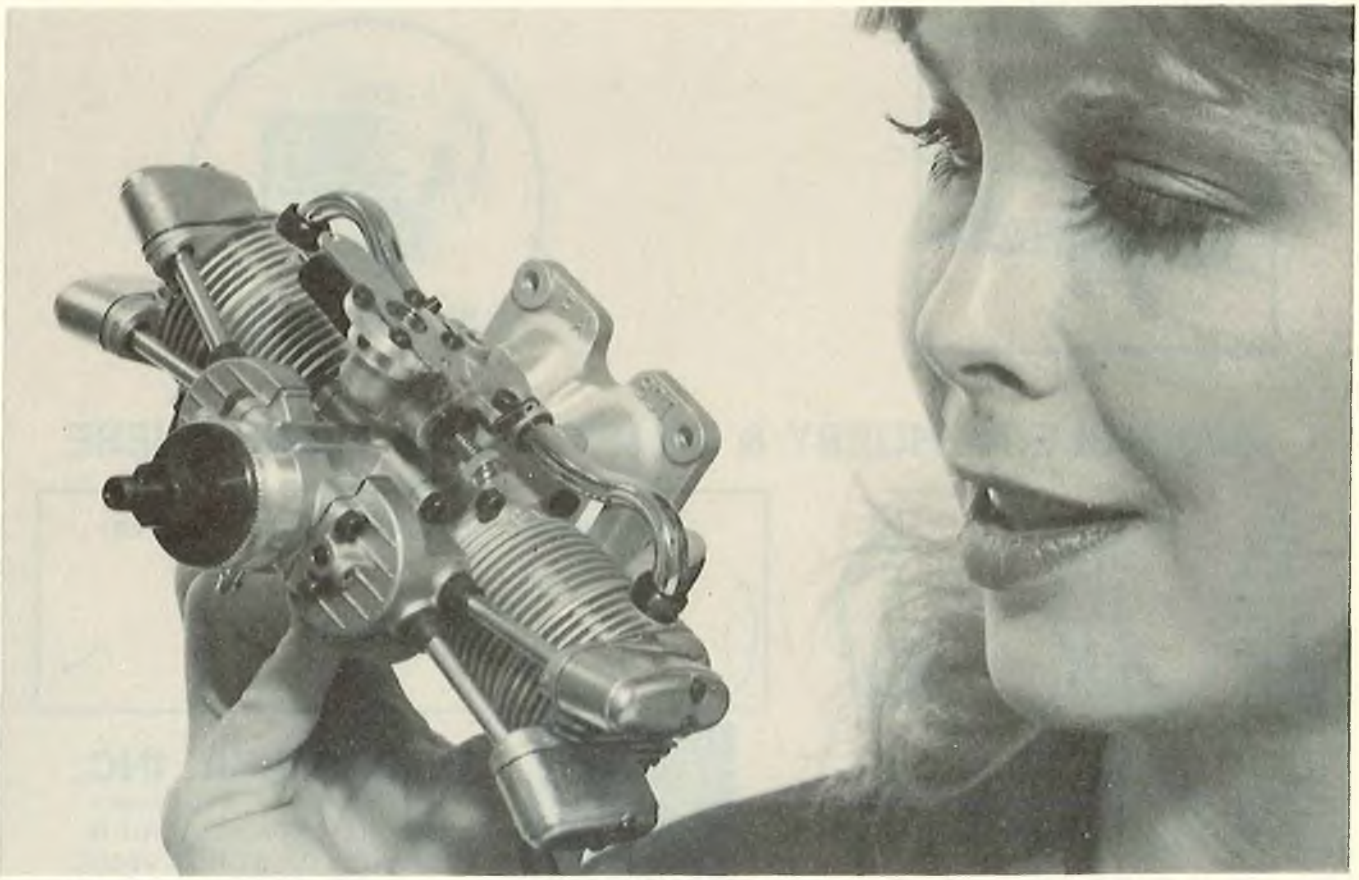

A sweetheart of an engine. Miss Patty Koepp admires the Saito FA-80 ABC 4 cycle twin. This little gem is built like fine jewelry and its performance must be seen to be appreciated. The FA-80 is available from Hobby Shack.

FLYING LOWE

Don Lowe

Looks like I have again missed a column. As you may have read last time, I have moved to Florida and we are still trying to get settled. Haven't even unpacked my models and junk from my van — hope they survived the trip from Ohio. I have also mislaid some of my correspondence in the process and hope you folks will bear with me until I can sort things out. The last column listed my new address in Florida. For those who would like direct contact, I will again list my address and phone number at the close of this article.

Since I last wrote, a couple of major events have taken place: the Nationals and the World Championships in Mexico. By now I am sure you know the results, but I would like to add my comments. First, congratulations to Tony Bonetti for winning the Nationals. Tony has been in the fray a long time and seems to be flying better than ever! Gives this writer hope that there is still a chance for me! Tony was certainly flying very well at the team selection trials at Huntsville in June; so, I am not surprised to see it happen. It obviously was well-earned since a large number of our best fliers were there, including two of our International Team members.

World Championships: Speaking of the Internationals and the results, Dean Koger, the team manager, gave me the results and some of the inside story. The fact that Hanno Prettner won was no real surprise but, according to Dean, a newcomer, a gentleman by the name of Lossen from West Germany out-flew everyone in the finals. He finished fourth overall, but possibly should have taken it all. Our U.S. team did very well, again winning the team championship. For those of you who may not have seen the results, here they are again:

1. H. Prettner, Austria
2. D. Brown, USA
3. W. Matt, Liechtenstein
4. B. Lossen, West Germany
5. M. Radcliff, USA
6. G. Hoppe, West Germany
7. S. Helms, USA
8. I. Christenson, Canada
9. Akiba, Japan
10. Naruke, Japan

He that stalleth . . . falleth.

According to Dean, most fliers were using their old designs, especially the top fliers. Variable pitch props were used by Prettner, Matt and Helms. It is not apparent, obviously, that a variable pitch prop will make you a winner. It's a small thing and may help some fliers in some maneuvers. I'm going to reserve judgement on the device until I have had a chance to fly one myself. Maybe I'll have time for that among other things, since I now live in sunny Florida where one can fly all year around!

Most fliers also continue to use retracts, even though take-off, and landings are not judged in FAI

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Congratulations to the Circus Circus Team for their AMA Nats victories. L to R: 1st Place and National Champion Tony Bonetti, 2nd Place Steve Helms, and 5th Place Donald Weitz, Jr. Would you believe they all used JR radios, Webra engines and IM accessories?

HERE'S HOW

By Jerry Smith

The prices today seem to climb in a never ending upward spiral. It doesn't take much in small knickknacks, at your hobby shop, to run up a good size bill. Balsa wood? It's out of sight. After spending $38.00 for some the other day, I was surprised at how little I was carrying home. For those of you hard-pressed for funds, it will do well to look around the workbench and search out better utilization of scraps. You may have a gold mine right at your fingertips.

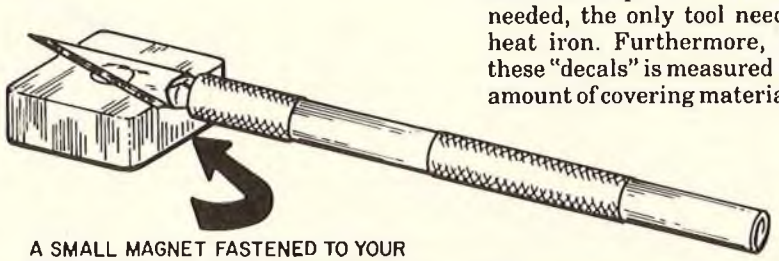
Out of pure necessity, Bill Kawai of Japan, came up with the following suggestion. A research of past issues of magazines, plus various catalogs, revealed that stars and bars in decal form were available from many sources for a price. For the moment, he felt that the costs were comparatively high, and thus, embarked on a method which would offer a similar item at a much reduced price.

Of course, the method to be described does entail a bit of "elbow bending," thus, not suitable for the short tempered, "all thumbs," bleary eyed, or those lacking in time — the one touch decals would still be recommended for this group!

As far as materials are concerned, a small sheet of 1/16" plastic and the usual colored, heat adhesive covering will be required.

The first thing that must be done is to draw on a sheet of paper the actual size of the stars and bars that you want to duplicate. From this template, carefully cut the plastic sheet to make another set of templates.

Thus, four plastic templates will form the basis for the stars and bars. Since there is no actual size limitation, the templates may be made to fulfill individual needs. Normally, it would appear that two different sizes would suffice. For the scale modeler, accurate detailed measurements would be recommended, but for general appearance "close enough" should be the key.



A SMALL MAGNET FASTENED TO YOUR WORKBENCH MAKES A NEAT PLACE TO PARK YOUR KNIFE. KEEPS IT FROM ROLLING OFF YE OLE BENCH!

As for the assembly (see drawing), the large blue bar is affixed in position and heat treated; next, the smaller white bar is centered on this blue field; then the blue circle is centered and affixed; the white star is then centered onto the circular blue field; and lastly, two red stripes to finish the emblem. Of course, one single red bar could be stretched across the white bar field before the blue circle is affixed with the same results. A coat of clear dope over the assembled insignia will protect it from fuel and grimy hands.

One of the features of this method of making insignia is that a number of stars and bars may be made at one time and kept in reserve. And when needed, the only tool needed is your heat iron. Furthermore, the cost of these "decals" is measured by the total amount of covering material used and, if they were scraps, how inexpensive is "free?"

Over the years, I've seen a number of suggestions for keeping X-Acto knives from rolling off your workbench and stabbing you in the leg. Most of these amounted to adding some sort or other of a protrusion to the blade or chuck area. While these suggestions would no doubt work, they would also destroy the "feel" of the knife. Here is a simple solution to

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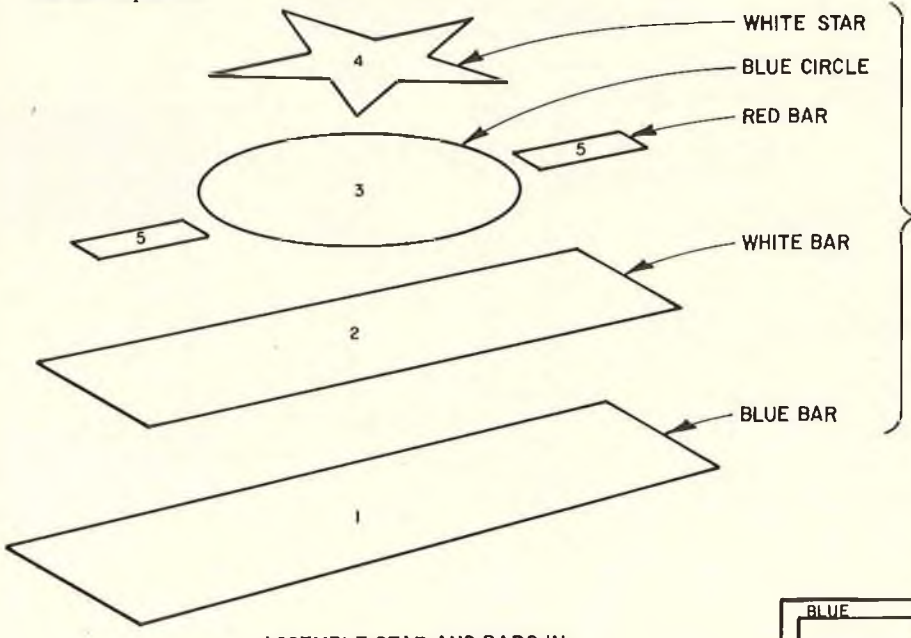
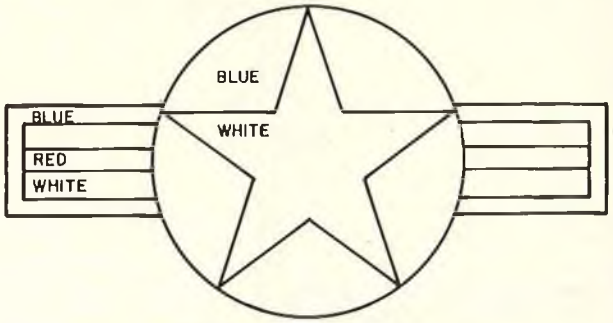


ALL COMPONENTS ARE MADE FROM PLASTIC COVERING FILM. USE OPAQUE COLORS

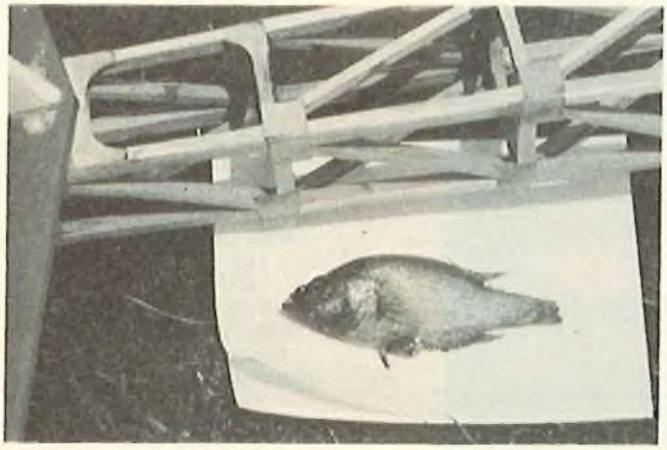
ASSEMBLE STAR AND BARS IN SEQUENCE SHOWN.

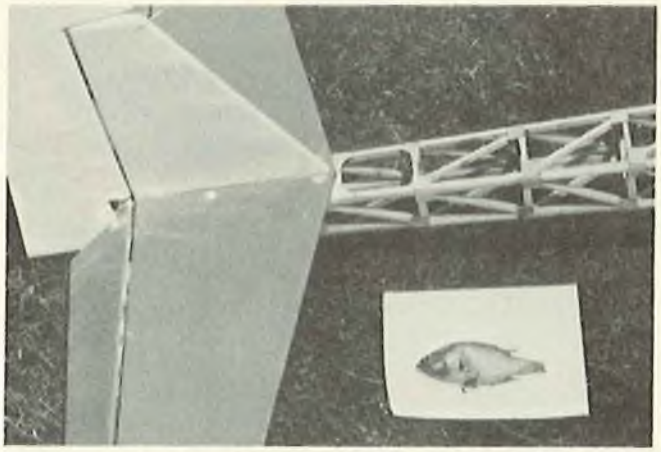


FINISHED INSIGNIA DECAL

CHEAP INSIGNIA DECAL

MANY THANKS TO BILL KAWAI





THE "BUTTERFLY TWO" THAT WENT FISHING

By Gordon R. Boose

(Editor's Note: This article appeared in Model Aviation Canada, magazine of the Model Aeronautic's Association of Canada, Norman C. Harris, Editor. Mr. Harris has kindly granted permission for the article to be presented to our readers.)

It was Sunday evening in July, a 15 mile per hour wind was steady from the S.E. She was up 500 feet going downwind to prepare for a landing. I tried to bring her down but the wind was just too strong up there, she was going beyond radio range — I did the best I could — I cut the throttle. She spiraled slowly down perhaps a mile away.

The wife and I took after it in the car. We drove to a farm I felt was close to the "spot." The farmer was in the yard moving a load of straw into the barn with his tractor. I explained my "plight" to him and added that there was a $25.00 reward for the return of the plane. I also left him my name and phone number. He was a good chap and he gave me permission to look over his fields, which I did till dark and then drove home feeling rather depressed and vowing to give it another go in the morning.

Next morning we looked for 3 hours with no luck and we returned home. The phone was ringing as we were getting out of the car. My wife answered it and she called me. I rushed up and the farmer's wife said that she had seen my airplane about 11:00 a.m. that morning (Monday).

She had seen four Boy Scouts paddling down the river with the airplane in their boat. She had called them to the shore of River Canard and told them that I had lost the plane Sunday night and that there was a reward for its return. She also got their names and address and told them to take it home with them and that she would call me. She promptly did that. I was overjoyed and very excited. She cautioned me to take my time, to drive carefully, and to come out to the farm for the boys' names and addresses. My wife and I drove to her farm and she asked me to follow her car to where the boys lived, as she was well-acquainted with the area. She explained that she had to return home soon as she wished to have lunch ready for her husband.

She drove to the boys' home, we followed. She introduced us to the surprised parents of the boys, who knew nothing of what had happened. I saw her off to her car, I thanked her and rewarded her with $10.00 for the "info" and help — she was pleased. I returned to the parents and explained what had happened, he was on holidays, she was a lovely hostess who offered us refreshments while the boys were returning home in the boat.

They arrived within an hour and brought with them my "Butterfly Two," it had come down in the narrow river — perhaps 75 feet wide, it had laid in the water 12 hours, supported by the large wing. The wing had separated about an inch from the fuselage, with the rubberbands still holding securely. It didn't look too bad after its ordeal, a bit muddy, but I felt a good cleaning would improve its appearance. I asked the boys "who had found it?" — in one accord they replied that they all had! So, I asked them if a reward of $5.00 each would suit them. They were overjoyed with the reward and I was happy to get the plane back.

I took the plane home, disassembled it, washed and cleaned it. I removed the radio and took it in for an expert overhaul. The July temperature was near 90°F. Monday and my wife complained that my modeling den smelled "fishy" — I told her it was just the river water that the balsa wood had soaked up. Tuesday — it was 90°F. again, she complained that the smell was worse but I just told her it was the wet wood. Wednesday — it was again 90°F. and I had to admit it was getting pretty strong. I started removing the MonoKote from the fuselage — figuring that it would perhaps dry out more rapidly. I removed a long strip from the top of the fuselage clean down to the rudder. Well what do you know! Low and behold! There lay a 4" perch up against the tail post! It had swam in through the wing separation and the fuselage and it had acted as a fish trap — the fish could not back up! Well . . . my wife sure let me know that she had been right! It really smelled fishy in that 90° weather!

I would like to go on record as having the first R/C plane that not only caught a fish, but brought it home too!! □

EAGLE 63

The growth and diversity of modeling is a never-ending, fascinating phenomenon. At first, practically all models were rubber powered free flights, and simple in structure. Then came control line which was an instant success and, much later, radio control. Improving the first crude radio equipment turned out to be a much more difficult situation, and many years passed before the technology advanced to the point where it could become a popular sport. Nowadays, a modeler can go all the way from tiny peanut models to giant scale jobs, from racing ships to sailplanes, and from sport ships to precision pattern models.

Along with this, so many people have been getting into modeling without a long apprenticeship, that there has been a real demand for simplification and prefabrication. The Eagle is intended to meet these criteria. Essentially, it's a conventional looking ship, with see-through cabin for appearance, extremely simple construction, and toughness created by considerable use of plywood and hardwood.

In spite of using these materials, the ship is surprisingly light, less than most balsa models of the same size. The lightness, combined with the high lift flat-bottom wing section, makes

EAGLE 63
Designed By: Carl Goldberg
TYPE AIRCRAFT
Trainer & Sport
WINGSPAN
62⅝ Inches
WING CHORD
11-9/16 Inches
TOTAL WING AREA
715 Sq. In.
WING LOCATION
High Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1¾ Inches
O.A. FUSELAGE LENGTH
45 Inches
RADIO COMPARTMENT AREA
3¼" x 11"
STABILIZER SPAN
23½ Inches
STABILIZER CHORD (Incl. elev.)
7" Avg.

STABILIZER AREA
162 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
8⅜ Inches
VERTICAL FIN WIDTH (Incl. rudder)
5-3/16" Avg.
REC. ENGINE SIZE
.29-.49
FUEL TANK SIZE
8-12 Oz.
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Plywood
Wing ..... Hardwood, Balsa
Empennage ..... Balsa
Wt. Ready To Fly ..... 78 Oz.
Wing Loading ..... 15.8 Oz./Sq. Ft.

By Carl Goldberg

the ship capable of the slow flight a beginner needs to go along with his slow untrained reflexes. The Eagle has no trouble maintaining altitude at well under half throttle on a K & B .40, yet it can really go when the engine is opened up. It has been flown very successfully on an O.S. Max .20, as well as having been wrung out with a real good late model K & B .61 (we were trying to break the wing with dives and sharp pull-ups). The HB 40 PDP has also given excellent results.

Overall, besides being an easy to fly trainer, the Eagle makes a very good sport ship — quick to build, tough enough to stand up to the rigors of lots of flying, and very maneuverable. It has been flown with three different dihedrals — low dihedral for the advanced sport flier, medium dihedral for the average modeler, and high dihedral for three channel equipment. Slow dihedral, of course, is best for inverted flight and certain maneuvers such as stall turns. Most people undoubtedly will fly it with four channels, but it does fine as a three channel bird, too. The equipment we've used has been Futaba and Kraft, and the final model has Airtronics' equipment. All of it has done well. Most of the flying has been done with the K & B .40 and an 8 ounce Sullivan tank. It takes a 10 ounce tank easily and even a 12 ounce tank with very little difficulty. An outstanding feature has been that it's not particularly sensitive to the C.G. location. We moved the C.G. back and forth, and anywhere near balancing on the main spar works out well.

All of the prototypes were built completely with Super Jet. It does such a good job on plywood, hardwood, and balsa wood, it makes building a model much easier. We sure wouldn't want to go back to any of the older glues. One caution here — **do not use any of the watery thin** cyanoacrylates such as regular Jet, Hot Stuff, etc.; they are simply not intended for models of this type. You can use epoxy, or aliphatic resin glues, but it will slow the building down considerably.

THE EAGLE 63 IS:

★ Good Looking

★ Gentle to Fly

★ Easy to Build

★ Economical

The Eagle will soon be available as a kit, but with the RCM plans, you can scratch-build your own. Some of the parts will be slightly different from the photos because of design improvements. By the way, one of our prototypes used 1/8" balsa sides, but with a 1/16" plywood doubler in the forward areas. If you use balsa sides, be sure to brace the cabin center posts with some vertical grain material.

CONSTRUCTION

Wing:

1. ☐ Cut out rectangular strips for each rib drawing. Using rubber cement or similar, glue the strips to 3/32" balsa, and cut out pairs of all ribs except where you need more than two.

2. ☐ Notch trailing edges (T.E.) according to spacing shown on the plan.

3. ☐ Pin right wing T.E. in place on the plan, then the bottom spar.

☐ Tack-cement aileron to T.E.

☐ Using no glue, place the following four ribs in their respective T.E. notches: ribs #2, #3, #4, and #4, hooking them over the spar as you go. Place some rib wood scrap under rib #2 as a shim.

☐ Glue ribs #3, #4, and #4 to T.E. and spar. **Do not glue ribs #2 at this time.**

4. ☐ Position leading edge (L.E.) dowel in place over the plan. Press it into rib recesses, holding it tight with angled pins as you go.

☐ Do not glue #2 at this time. Glue ribs #3, #4, and #4 to L.E.

5. ☐ Pin end of L.E. and spar in place as shown. Remove rib #2 and scrap shims.

☐ Slide sheet B forward until it just touches the L.E. and align it with the end of L.E. (Note wood grain direction.) Mark spar location on both edges of sheet with your knife. Use metal straightedge to trim off excess material.

☐ Cut sheeting to fit between spar and T.E.

☐ Glue rear sheeting halves together, then glue all sheeting to L.E., spar, and T.E.

6. ☐ Position and glue two ribs #2 to L.E., bottom sheeting, spar, and T.E.

7. ☐ Glue rib #4 in place at wing tip, gluing to spar and T.E. only.

☐ Working one at a time, glue remaining ribs #3 and #4 in place. Glue to **spar and T.E. only.**

8. ☐ Spar "set-back gauges" can be used to set back top spar to minimize sanding. Choose proper gauge to suit your dihedral, and position it touching bottom spar. Touch end of top spar to gauge, and set spar in rib slots.

☐ Glue top spar to all ribs.

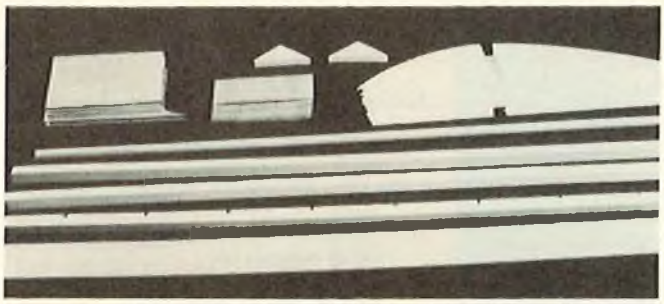
☐ Glue wing tip gussets to L.E. and T.E.

EAGLE 63 MATERIALS LIST

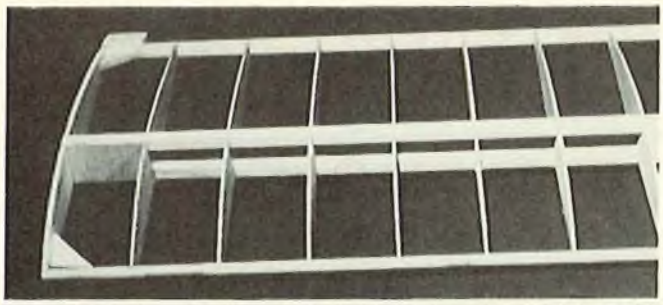
3/32" x 3" x 36" med. balsa, 7 req'd. — wing ribs, shear webs.
3/32" x 4" x 36" med. balsa, 1 req'd. — wing sheeting.
1/4" x 3" x 36" med.-med. hard balsa, 1 req'd. — tail parts.
1/8" x 12" x 48" lite ply, 1 req'd. — fuselage sides.
1/8" x 12" x 24" lite ply, 1 req'd. — fuselage top & bottom, etc.
1/8" x 6" x 12" birch ply, 1 req'd. — wing joiners, braces, servo rails.
1/4" x 6" x 12" birch ply, 1 req'd. — firewall, breakaway plate.
5/16" x 1¼" x 36" tapered trailing edges, 2 req'd. — ailerons.
3/8" x 1/2" x 36" med. balsa, 2 req'd. — wing trailing edges.
3/8" x 3/8" x 36" bass or spruce, 4 req'd. — wing spars, hatch supports.
5/16" dia. x 36" dowels, 2 req'd. — leading edges, hold-down dowels.
1/8" x 1/4" x 36" med. hard balsa, 3 req'd. — tail trussing.
3/8" x 1/2" x 12" birch, 1 req'd. — engine bearers.
5/16" x 5/16" x 24" med. hard balsa, 2 req'd. — pushrods

Accessories:

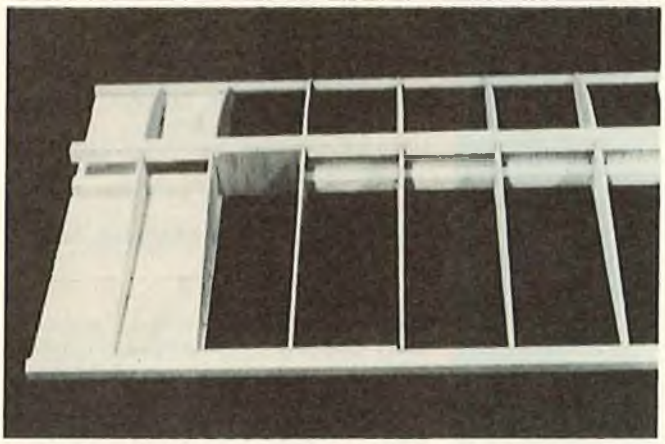
Long control horn, CG #CH-1, 1 req'd.
Short control horn, CG #CH-2, 1 req'd.
4-40 x 1/2" socket head screws & washers, CG #SH-404, 4 ea. req'd. — engine mounting.
4-40 x 3/4" socket head screws & washers, CG #SH-406, 4 ea. req'd. — breakaway mounting.
4-40 x 1/2" pan head mach. screws, nuts & washers, 4 ea. req'd. — nosegear bearing.
3/32" strip aileron horn set, CG #SAH-332, 1 set req'd. — ailerons.
True 1/16" pushrods, CG #AP-1, 1 bag of 2 req'd. — ailerons.
Nylon Snap-Links & rods, CG #SL-1, 3 req'd. — horn connections, throttle.
1/16" dia. x 36" music wire, 2 req'd. — nosegear steering, throttle, etc.
Williams Bros. 1½" scale civilian pilot, 1 req'd. — for realism.
1½" x 1½" x 12" soft balsa, 2 req'd. — wing tips.
.030" x 8½" x 17" clear plastic, 1 req'd. — windshield and windows.
2½" x 2½ ft. nylon fabric, CG #N2 — wing center wrapping.
.006" x 1" x 3" half-hard aluminum from beverage can, 2 req'd. — trailing edge reinforcement.
Angle hold-down, CG #AH-1, 1 bag req'd. — hatch.
Pushrod connectors, CG #PC-1, 6 pcs. req'd. — servo connections.
5/32" nosegear strut w/adjustable axle, CG #NSA-532, 1 req'd. — nosegear.
4-40 blind nuts, CG #BN4, 8 req'd.
5/32" steel wheel collars, CG #WC532, 6 pcs. req'd. — wheel retention.
5/32" music wire for main gear struts, 28" req'd. — landing gear.
1/16" threaded coupler, CG #TC116, 1 req'd. — throttle pushrod.
Klett pinned hinges, regular size, 1 bag req'd. — control surfaces.
Fuel line, 1 foot req'd.
Fuel tank, 1 req'd.
Propeller to suit engine — for .40, use 10/6.
2¼" spinner, CG #S225BK, 1 req'd.
Foam rubber 1/2" x 6" x 12", 1 req'd. — radio protection.
Wing seating tape, 1/16" x 1/4" x 36", 1 req'd. — wing cabin sealing.



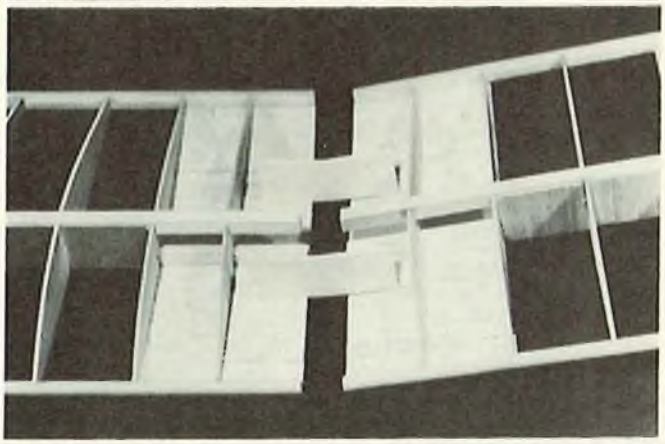
Cut a complete set of parts for wing before starting assembly. L.E. is 5/16" hardwood dowel.



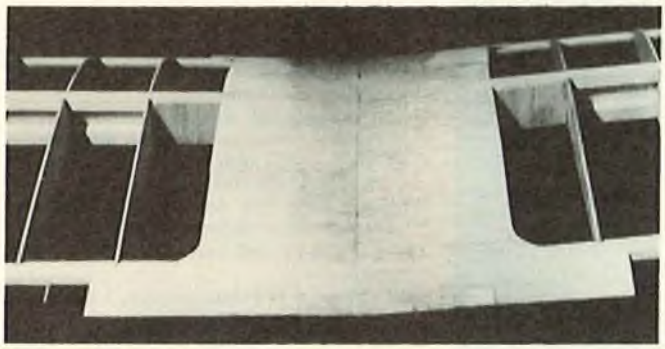
Right wing panel completed with tip gussets and outer T.E. piece glued in place.



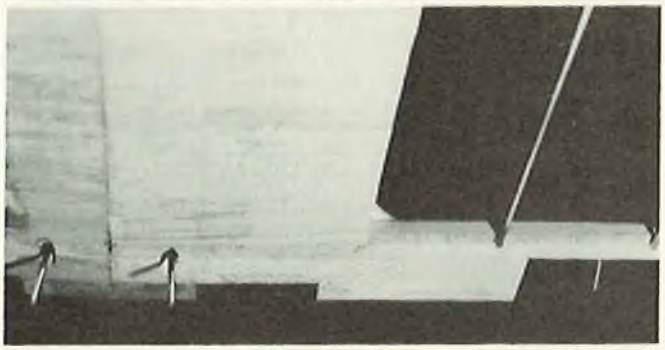
Right panel shown at center section ready to be joined to left panel.



Joining wing at center section (step 15). Handy ply clamps are used for this operation.



Joined wing panels. Note aluminum T.E. strip installed and 2½" nylon fabric wrapped around center joint.



Bottom of wing center section showing aileron horn wires installed.

9. ☐ Working a few ribs at a time, apply Super Jet to glue loose ribs to L.E. Gently squeeze L.E. into ribs and hold until set. Repeat until all ribs are glued to L.E.

10. ☐ Glue shear webs to spars at locations shown on the plan.

11. ☐ Repeat steps 3 through 10 for left wing.

12. ☐ With left wing still pinned down, position right wing in place next to it. Raise right wing tip, and support it with blocks or books at the height you have selected for dihedral.

13. ☐ Study center joints and, if necessary, slightly sand protruding parts for better fit.

☐ Be sure right wing is held firmly against left wing, and pin in place.

14. ☐ Apply a liberal bead of Super Jet to the joints of L.E., spars, sheeting, and T.E.

15. ☐ Apply two beads of Super Jet to one side of both dihedral joiners, near top and bottom. Position one end of joiner in place and swing the other end up against the spars — hold momentarily. Repeat for other joiner — immediately install plywood clamps to hold both joiners tight on the spars.

16. ☐ Position front and rear halves of one rib #1 so one side aligns with the center of the wing. Adjust rib to align with spar center joint, T.E., bottom sheeting, and L.E. joints. Glue in place.

☐ Glue remaining halves of second #1 rib to first rib, making double thickness center rib at center joint.

☐ Be sure to glue any joints of the wing that still need glue.

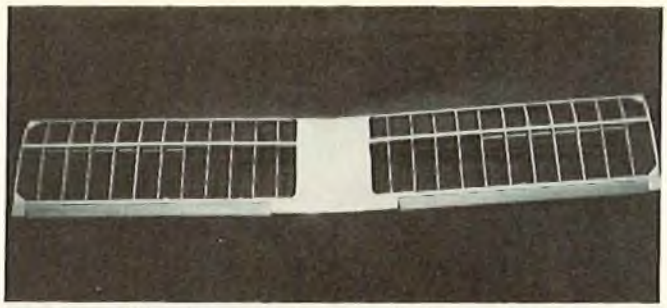
17. ☐ Remove all clamps, gauges, and pins from the wing structure.

☐ Glue top sheeting in place, trimming to fit as required.

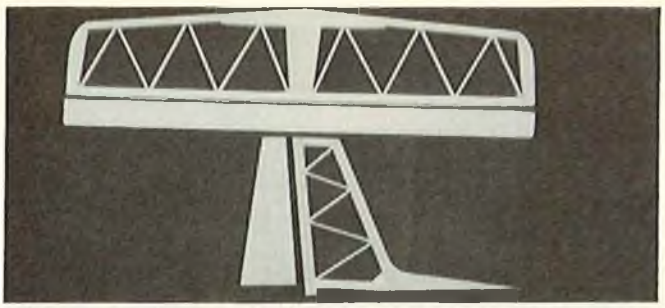
☐ Turn wing upside down, and glue any joints still needing glue.

18. ☐ Slide nylon tubing onto 3/32" strip aileron horn wires.

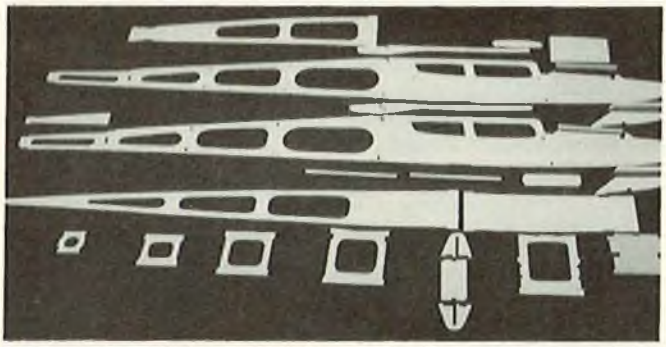
☐ Make one **left** and one **right** aileron horn by bending unthreaded



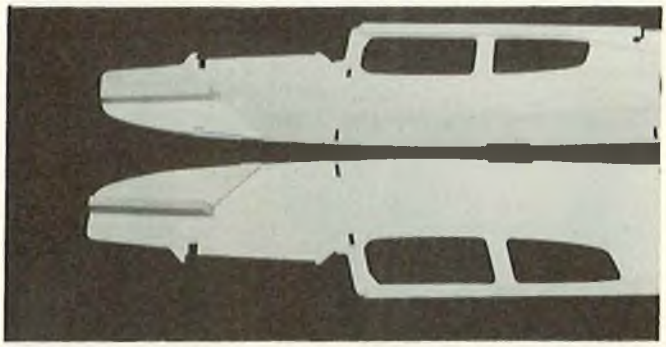
Completed wing construction with tips still to be added.



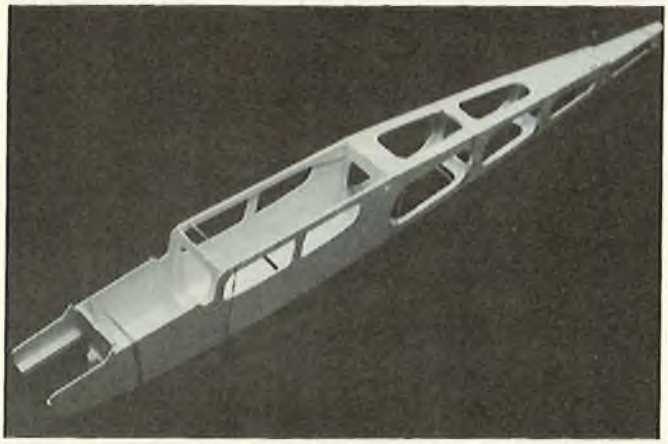
Completed tail group. Slot has to be cut in stab to accept fin post.



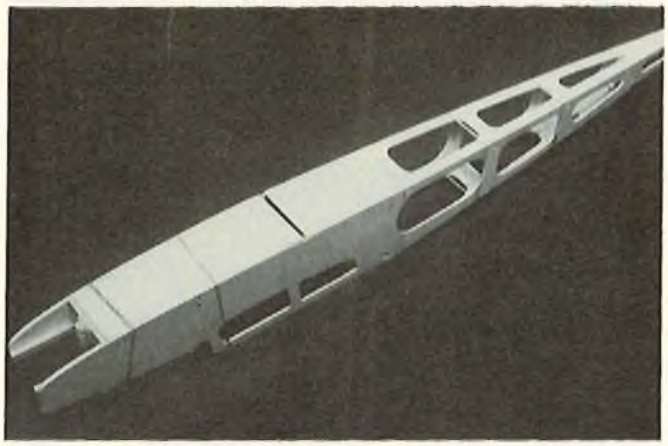
Best to cut complete parts kit for fuselage before starting assembly.



Fuselage sides with nose doublers, bearers and cabin top doublers glued in place. Fuselage side template has outline for proper location of nose doubler.



As outlined in Step 7 of fuselage assembly, sides, formers, top and bottom are now glued.



Bottom view of assembled fuselage. Note gap for landing gear to slip into.

end of wire 90 degrees at end of nylon tubing as shown. Wires should rotate easily in tubes; binding between wire bend and tubing may be relieved by shortening tubing slightly. Observe offset angles for differential action.

19. ☐ Carefully remove aileron from T.E. Mark center line along entire lengths of T.E. and aileron. Photo shows this being done with C.G. Center Line Marker.

☐ Mark each T.E. 7" from center joint.

☐ Mark **front** of ailerons 7", and **bottom** of ailerons 6" from inner ends.

20. ☐ Wrap sandpaper around a square cornered block to make "V" grooves 7" long by 1/16" deep in T.E. and ailerons on both wing halves.

☐ Using threaded end of an aileron horn, file grooves to a rounded shape so half of the nylon tubing will lie recessed in both the aileron and T.E.

21. ☐ Carefully cut the ailerons at 6" marks. Save short pieces for T.E. inboard sections.

☐ Using threaded end of aileron horn as a file, make clearance slots 3/8" from center joint in wing T.E., and 3/8" from inner ends of T.E. inboard sections.

☐ Temporarily place horn in wing grooves, position both T.E. inboard sections, and check for horn movement — top to move about 3/4" total fore and aft.

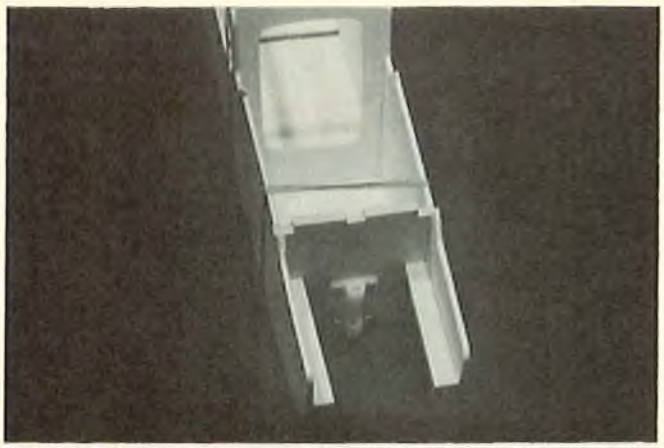
☐ Carefully glue tubing and T.E. inboard sections in place.

22. ☐ Cut 1¼" off wing tip end of ailerons, and glue to T.E., flush with outer end of T.E.

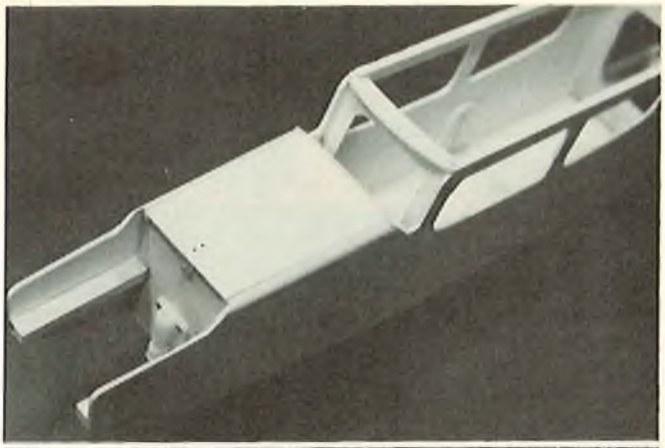
23. ☐ Pin the balsa pushrod to the underside of the aileron flush with rear edge.

☐ Sand bevel up to the center line of the aileron with square-cornered sanding block on table. Turn the aileron over and repeat.

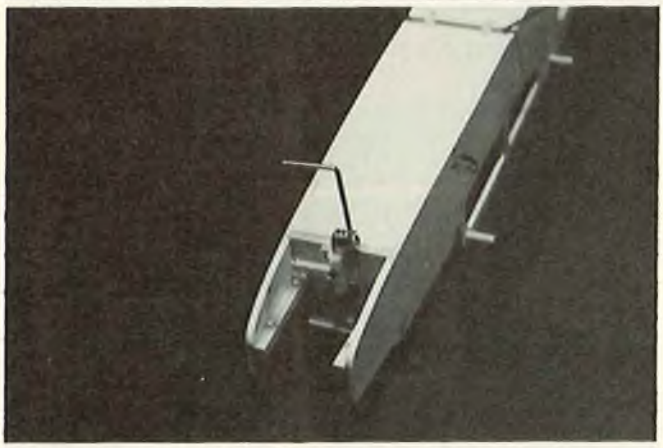
24. ☐ Holding threaded end of one aileron horn nearly straight up, slowly press the aileron on the other end of the wire to make a mark. With a

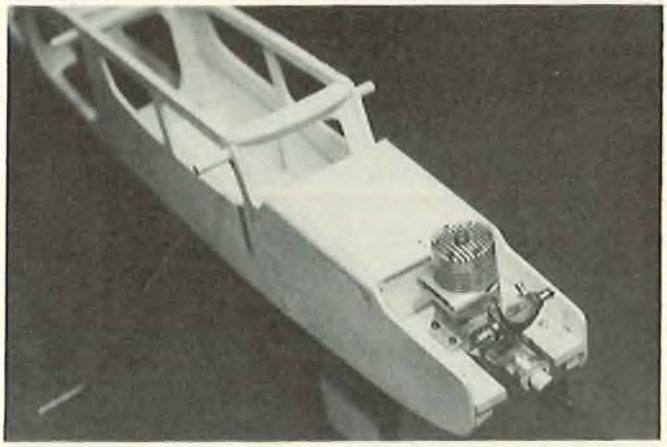


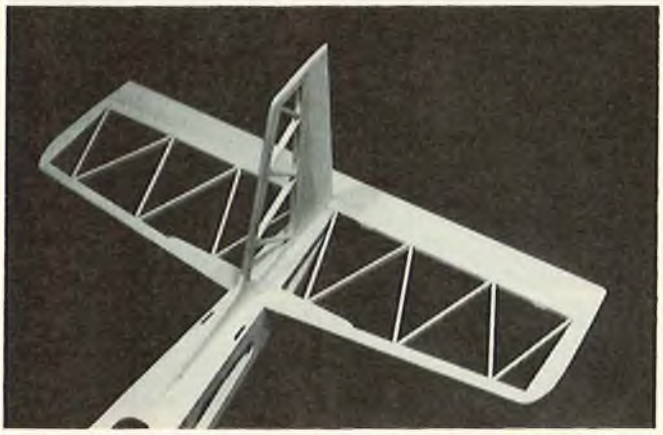
ABOVE: Notch in center of firewall is for hatch hold-down nylon bracket (CG #AH-1). Outer notches are for bass hatch supports. Bottom view showing nose gear installation. Blind nuts secure ply engine mounting plate.



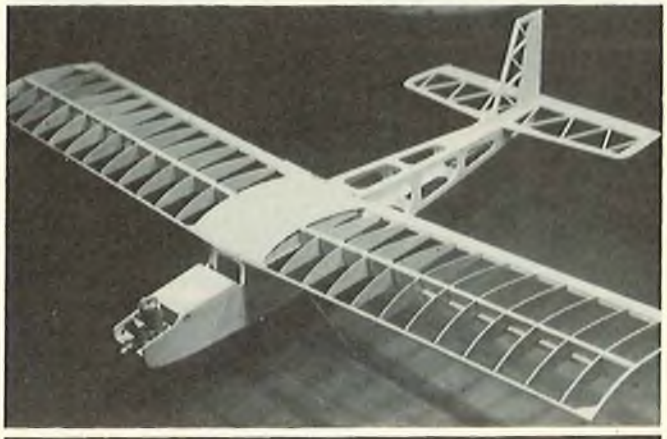
ABOVE: Hatch installed and front end ready for engine installation. BELOW: K & B .40 installed in nose. Eagle 63 has been flown with an O.S. Max .20 and up to a K & B .61.







Tail group has been carefully fitted to fuselage and is not glued in place until after covering is completed.



Completed Eagle framework still minus wing tip blocks. Builds into a very strong model.

small nail, make a hole for the wire. Repeat for other aileron.

☐ Place T.E. and aileron on plan, and mark hinge locations.

☐ Preferably using a hinge slotting kit, cut hinge slots. Temporarily install hinges and test fit ailerons. The gap between T.E. and the aileron should not exceed 1/32". Hinges are permanently installed after covering.

25. ☐ Using 240 grit (fine) sandpaper, flat sand entire wing to blend surfaces and remove high spots.

☐ Cut half-hard aluminum sheet from pop or beer can into two 1" x 3" pieces, and lightly sand aluminum surfaces for better gluing. Apply a bead of Super Jet to half of a 3" sheet, and glue it to the wing T.E. as shown. When dry, apply glue to other half and then wrap it around T.E. Repeat for other 3" piece.

26. ☐ Apply a dab of Super Jet at center joint on the wing bottom, and stick one end of 2½" wide nylon to it. Let dry a few seconds until the nylon is **glued solid** to the balsa.

☐ Apply a squiggle of glue to wing center, and pull nylon fabric into it. Rub nylon into glue with your finger (cover finger with plastic bag or similar).

☐ Repeat gluing procedure and apply nylon around L.E., across top of wing, around T.E., and finally overlapping where you started on the wing bottom.

☐ After entire center joint has

been wrapped with nylon, apply another coat of glue and smear it over and through the nylon.

27. ☐ Make two slide check blocks from scrap balsa, and glue to T.E. inboard sections as shown on the plan.

☐ Glue plywood wing braces to T.E. as shown on the plan.

28. ☐ From 1/8" ply scrap, make aileron servo rails. Temporarily mount servo on rails.

☐ Carefully position servo over bottom of wing and mark size for opening.

☐ Cut out bottom sheeting. Remove material from rib #1 as required to suit your servo.

☐ Glue servo rails to wing, and fill any gaps under the rails with slivers of scrap balsa. Avoid getting glue on servo! Remove servo before covering wing.

29. ☐ Add wing tips and sand to blend. Wing is now ready to cover.

Tail Assembly:

1. ☐ Lay down stabilizer outline as shown. Make sure all fits are good.

☐ Glue all joints, pinning parts in position.

2. ☐ Cut all trusses to size over the plan and glue in place.

☐ Glue gussets in place.

☐ Temporarily place elevator in position next to stab T.E. on the plan, and mark hinge locations on both T.E. and elevator.

3. ☐ Assemble fin in same manner as stab. Tack cement rudder to fin, and mark hinge locations on both.

☐ Flat sand fin and stab, round outer edges except stab T.E. and the lower 2" of fin L.E.

4. ☐ Slot stab T.E. and fin T.E. for hinges. Do not install hinges permanently until after the model is covered.

5. ☐ Mark center line on the rudder L.E. and the elevator L.E.

☐ Slot the elevator L.E. and the rudder L.E.

☐ Sand L.E. of rudder to 45° angle on each side of center line.

☐ Sand L.E. of elevator to 30° angle each side of center line.

6. ☐ Tape the elevator to the stab (on top and bottom) and sand the elevator tips, etc., to blend with the stab.

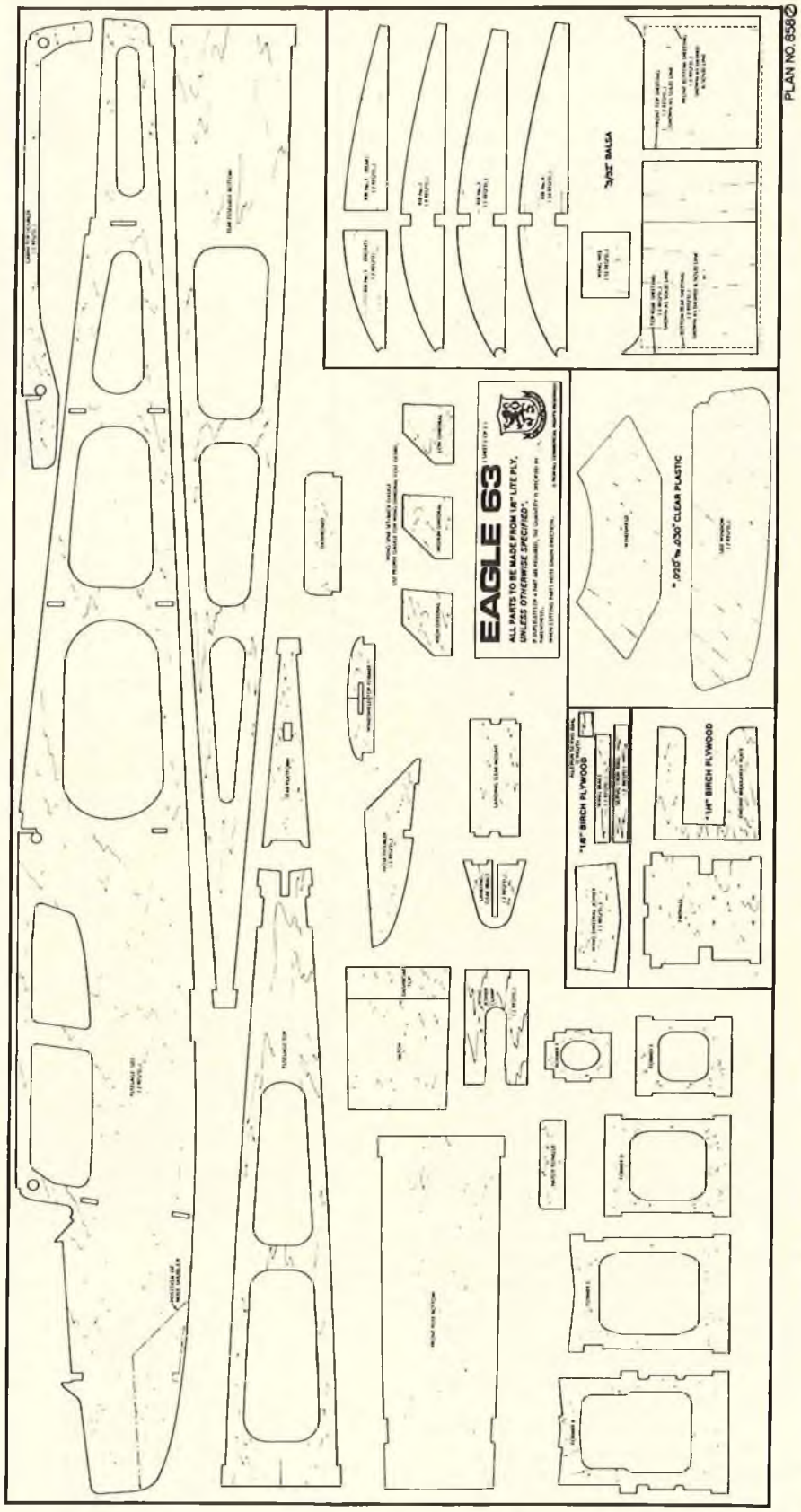
Fuselage Assembly:

1. ☐ Prepare all fuselage parts for assembly. Lightly sand all rough edges.

2. ☐ Run a bead of Super Jet all over one firewall, then carefully set second firewall in place. When position is accurate, press it in place.

3. ☐ Drill four 1/8" diameter holes through the firewall for nosegear bearing.

☐ To prevent oil penetration, seal entire area that will be under the bearing with Super Jet, smeared into the wood with your finger wrapped in a plastic bag.



☐ Use a toothpick to run Super Jet around inside holes.

4. ☐ Install nosegear bearing on the firewall, using #4 x 1/2" machine screws and nuts. Place a drop of Super Jet on the nuts to lock them in place.

5. ☐ Temporarily position cabin top and doublers, nose doublers, and engine bearers on the fuselage sides. Check fit and placement of parts before gluing.

☐ Glue nose doublers to the

sides, making sure to flush parts as shown.

☐ Glue bearers solidly to the sides, and edge of nose doublers.

☐ Glue cabin top doublers in place.

Important: In the following steps, do not use glue until called for. Hold parts using rubberbands and masking tape.

6. ☐ Plug formers B and F into the slots in the body sides.

☐ Install remaining formers A, C, D, and E in the same manner.

☐ Temporarily install wing dowels. Formers B and C should rest against them.

☐ Insert top sheet under rubberband at former C, and work it towards the tail, slipping it under bands as you go.

☐ Lock tabs at both ends of the top sheet into corresponding notches in the fuselage sides.

☐ Position the stab platform in place between the tail end and former F.

☐ Position the front and rear bottom sheets in the same manner.

7. ☐ Place the fuselage over **top view** on plan and carefully align the fuselage to match the plan outline.

☐ When satisfied with alignment, permanently glue the sides, formers, and sheet parts in place. Apply a bead of Super Jet along all joints (inside and outside) — it will penetrate the joint and leave a slight reinforcing fillet.

8. ☐ Glue the windshield top former and dashboard solidly in place.

9. ☐ Tape the hatch cover and dashboard top together.

☐ Tape the hatch supports to both sides.

☐ Position the taped parts in place on the fuselage. **Glue only** the hatch supports to the body sides.

☐ Remove the hatch cover from the fuselage and glue the 1/8" ply tongue in place on the bottom of the hatch cover.

☐ Glue the dashboard top to the hatch supports and dashboard.

10. ☐ Place the landing gear (L.G.) mount on the inside bottom of the fuselage. The cutouts at each end of the mount **must** be positioned evenly over the slot in the fuselage bottom. Glue the mount in place.

☐ The L.G. braces interlock with the L.G. mount. Glue the braces solidly to the fuselage sides and L.G. mount.

Engine Installation and Fuselage Completion:

1. ☐ Mount the propeller and spinner on your engine.

☐ Tape breakaway plate on the engine bearers. Note cut-out is on an angle for right thrust.

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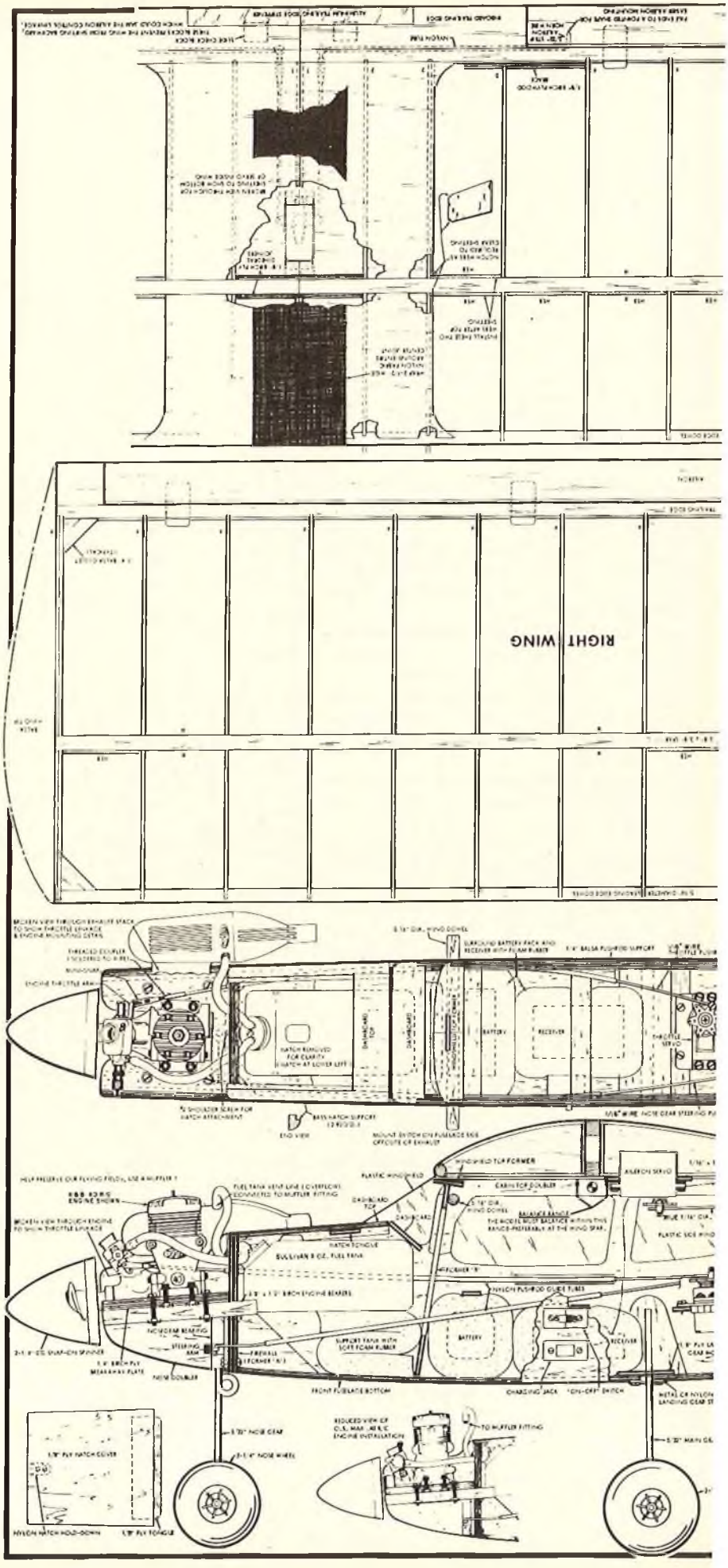
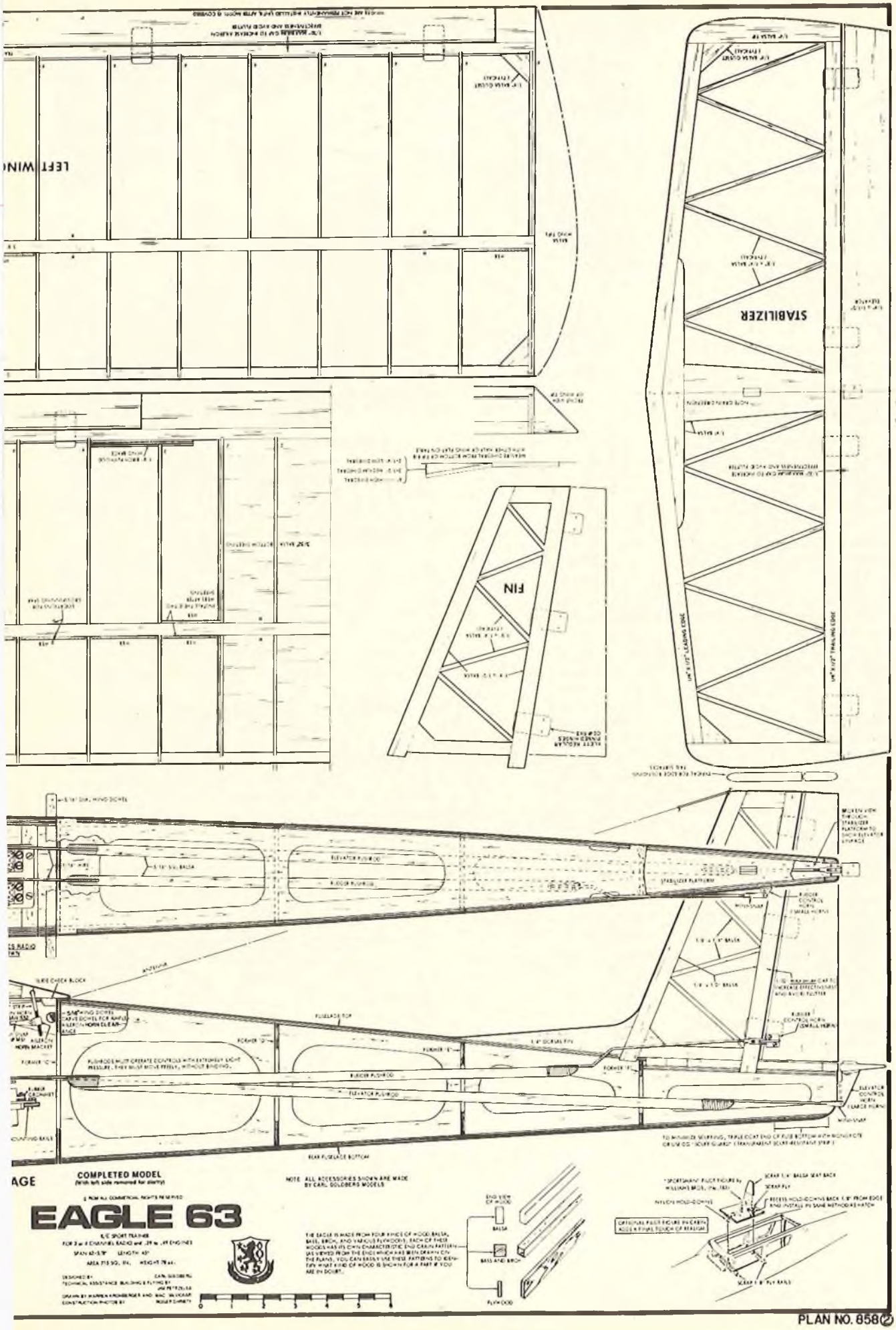



STABILIZER
FIN
COMPLETED MODEL
EAGLE 63
NOTE: ALL ACCESSORIES SHOWN ARE MADE BY CARL GOLDBERG MODELS

PLAN NO. 858②

☐ Try your engine on breakaway, and make any necessary adjustments.

☐ Maintain approximately 1/8" clearance between the spinner backplate and fuselage front.

☐ Temporarily set the engine in place by taping, tying, or tack gluing with Super Jet, and measure for right thrust. Left side distance should be approximately 1/4" longer than right side.

☐ Mark through the mounting holes onto breakaway plate.

☐ Remove the engine and breakaway plate. Drill four 1/8" screw holes through breakaway. Use scrap ply under parts when drilling to avoid splintering.

☐ Use four socket head screws and washers to draw the blind nuts up into place on underside of breakaway.

☐ Using the plan as a guide, measure and mark hole locations for holding breakaway onto bearers.

☐ Tape breakaway in position on the fuselage. Drill a 1/8" hole through breakaway and engine bearer. Insert a #4 x 3/4" pan head screw in the hole.

☐ Continue this procedure, one hole and screw at a time, until all four screws are in place.

☐ Using screws and washers, draw the blind nuts up into the bottom of the engine bearers.

2. ☐ Refer to the main plan for suggested location, and drill two 3/16" diameter holes for the fuel lines through the firewall.

☐ For throttle pushrod, drill a 1/8" diameter hole through the firewall as indicated on the plan. **Be sure** the hole is on the same side as your engine throttle.

☐ Temporarily install the nosegear strut and steering arm in the nosegear bearing. Swing the steering arm over to the side opposite to the throttle pushrod hole. Drill a 1/8" hole through the firewall for the steering pushrod, directly behind the outermost hole in the steering arm and about 1/8" above it.

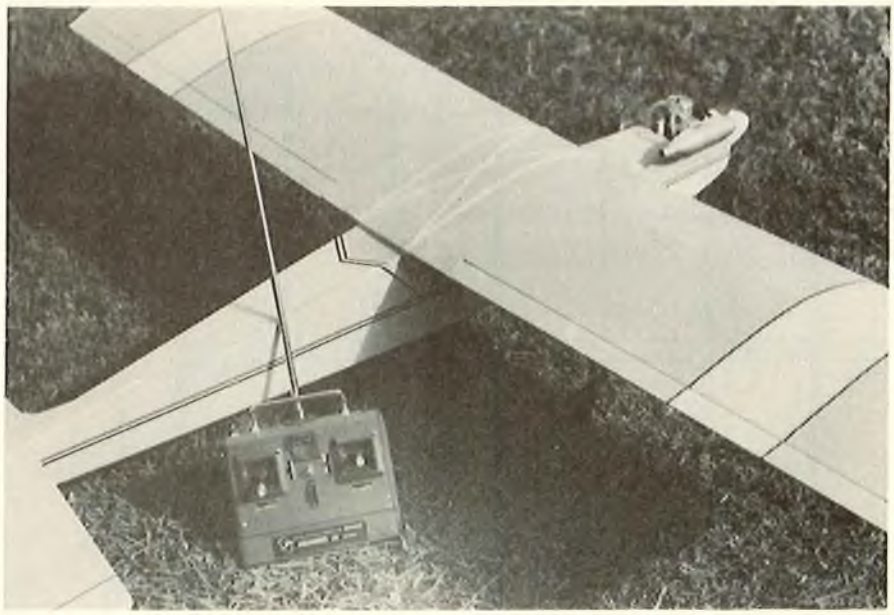
☐ Remove breakaway, steering arm, and nosegear strut from the fuselage.

3. ☐ Secure hold-down to hatch with two #2 x 3/16" wood or sheet metal screws.

☐ Set the hatch in position on the fuselage. Mark for screw location and install the screw exposing enough unthreaded shank to engage hold-down.

4. ☐ Temporarily install wing hold-down dowels in the fuselage. Rubberband wing in place, **making sure it is centered.** Viewing model from rear, see if the stab sets level with respect to the wing.

☐ Sand the stab platform as may be necessary to provide a good level fit



for the stab. Do not alter the angle of the fuselage sides.

☐ Center stab on the fuselage using a tape measure to obtain equal distance from side to side, and from the fuselage nose to rear corner of each stab tip. Pin in place.

☐ Trial fit fin in place. Glue dorsal fin to main fin, but not to fuselage. Finish sanding, then remove tail assembly.

5. ☐ Flat sand the fuselage and round off the corners, except for the top of the cabin, top of tail mounting area, and window openings. In these areas, sand only very lightly to remove burrs.

☐ Lightly sand the window frame area for good bond of windows to fuselage. Permanently glue the side windows in place, being careful to avoid smearing glue on the windows.

☐ Trial fit the windshield until you are able to tape it in place. Then start adhering it wherever possible, finally removing the tape, and gluing in those areas.

☐ Insert wing hold-down dowels through the cabin with a twisting motion, and glue in place.

☐ Using fuelproof paint, seal exposed ends of the dowels and any other unprotected wood surfaces.

6. ☐ Fuelproof the engine and tank areas, using either polyurethane enamel, Super Jet, or epoxy. Polyurethane is available in colors, so you can match your color scheme.

☐ Apply fuelproofer to entire engine area and breakaway, inside tank compartment, and bottom of hatch cover. Open up the screw holes with a toothpick while the paint is wet. Let dry thoroughly.

☐ Make up two balsa pushrods per the plan and sketch.

Covering:

1. ☐ A good covering job should be preceded by careful sanding, filling nicks and dents, then more sanding. Use a filler appropriate for balsa. For final sanding, use fine sandpaper (grade 240 to 320) and a sandpaper block.

☐ Our prototypes were covered with Super MonoKote. The bottom of each flying surface was covered first, then the top. In the case of the fuselage, the bottom was covered first, then the sides and, finally, the top.

2. ☐ Truing the wing is an **important step** and should not be rushed or omitted.

☐ Set one half of the wing on a flat surface to detect warp. To counter any warp found, twist panel slightly in direction opposite to the warp, and hold position while gliding an iron over the MonoKote to retension structure. Repeat process until the panel is true.

☐ Follow the same procedure with the other half of the wing.

☐ After covering the tail members, they should be checked for warps also.

3. ☐ To increase effectiveness and reduce the chance of flutter, keep all control surface gaps no wider than 1/32".

☐ To fasten hinges permanently in place, apply a squiggle of Super Jet to the hinge slot, and to both sides at one end of the hinge. Carefully position and insert the hinge, and wipe off squeezed-off glue immediately.

☐ Insert hinges first into main surface. Then insert just the end of the hinges into the control surface. Apply Super Jet where the hinges start into the control surface, then in one smooth motion carefully bring the control surface all the way into place. Use a paper towel to blot squeezed-out glue from the hinges.

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SUNDAY FLIER

Ken Willard

Seaplanes and flying boats have been around for a long time, but one of the most important elements of their design has been around a lot longer. For this bit of knowledge I am indebted to no other than Irwin Ohlsson, the famous engine designer (many of you old timers will well-remember the O and R series of gas engines; Irwin is the "O" of the O and R). Irwin is now hooked on water flying, and studies all aspects of the sport. At a recent fly-in, he and I were talking about seaplanes and flying boats; Jim Wade and Harry Appoian were listening intently as Irwin asked, "Do you know who invented the step which is used on hulls and floats?"

I didn't nor did the others. "Who?" I asked.

"The Reverend Charles Ramus. And he came up with the concept in the year 1872!"

"1872? Airplanes were only visionary at that time."

"True," replied Irwin. "He didn't have seaplanes in mind. He was trying to devise a more efficient hull for hydroplanes."

Naturally, when the airplane came along, the same principle applied to floats which would make it possible to take-off from the water.

Irwin quoted as his authority for this fact a paper read by Ernest Stout of Consolidated Vultee Aircraft Corporation, at the S.A.E. National Aeronautic Meeting in Los Angeles in October of 1952. (He later sent me a copy of the paper.)

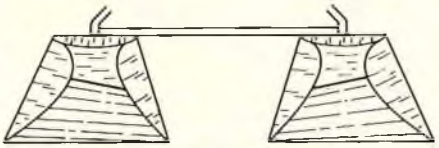
I was fascinated; so were Jim and Harry. But Harry couldn't resist his impulse.

"You say Reverend Ramus invented the step? He was the father of the concept?" Somehow, knowing Harry, I could almost see it coming.

"That's right," replied Irwin.

"Well, then," opined Harry, "I guess that makes him the stepfather!" Groan. Wish I'd thought of it.

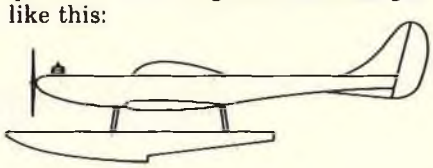
We talked about seaplanes some more, and Irwin told me about his design for twin floats that has been very successful. I was unaware of it, and didn't include it in the prior article wherein I showed some float bottom designs, so, to make the list more complete, here's Irwin's contribution. He uses a flat bottom float, but with a difference. At the step, the flat bottom is horizontal when the plane is at rest; then as you go forward from the step to the nose of the float, the bottom stays flat, but is twisted so that the bottom slants up and out, like this:



FRONT VIEW

If any of you other water flying enthusiasts have a different idea for float design, send them in. But first, make sure they work.

Now let's get on with some of the other problem areas that plague waterborne aircraft — like this one for instance. How big should twin floats be, relative to the fuselage length of the airplane (seaplane)? Answer. Big enough to support the model in the water without submersing so far that when you apply power and start moving forward, they won't dig in and refuse to come up on the step. And that, naturally, will be a function of the wing loading. The higher the wing loading, the bigger the floats have to be. Note how big the twin floats were on the "Schneider Cup" Cup racers compared to the fuselage. In contrast, look at the current floats being added on to some of the ultralight designs of today. There is no single answer, but for starters, if you want to add floats, a fairly good rule of thumb is to make the length of the floats about three quarters of the length of the fuselage, like this:



If you want the model to float higher in the water, make the floats wider or longer, or a bit of both. One thing --- if you make them longer, extend the length both forward from the step and aft, and keep the step under the center of balance. When you do this, you probably will also have to add some vertical fin area. And, in doing so, you'll find you have an easier seaplane to take-off and to fly. Dennis Sumner of Dearborn, Michigan, did it with his design (Photos #1 & #2).

If you go the route of buying a kit for a set of floats, note what the manufacturer of the kit states are the weight ranges for which the floats are designed. If your model doesn't fit exactly in the weight range, just be sure of one thing; the model should not exceed the maximum weight recommended. It can be less than the minimum weight, and still perform very well, so long as you make sure the vertical fin area will compensate for the relatively large floats. But, I wouldn't recommend putting floats which are supposed to be okay for a four pound model on one that weighs more than that; you're just asking for trouble.

One of the most nagging problems of twin float flying is steering the model on the water. A water rudder is almost a must, unless you are very adept at gunning the throttle at just the right time to make the air rudder effective. But, working out a steering mechanism for a water rudder can be very frustrating. Even more so when you try to put rudders on both floats. So, put the rudder on only one. But, you say, and rightly, that means I get uneven water drag when on the step, and a veering type of liftoff that frequently ends in a dunking. Tom Minger has an interesting solution to that; he uses a water rudder on one float. Then, on the aft end of the other, he attaches a 1/8" dowel which extends down into the water and creates drag equal to that of the water rudder. Then, when he gets the model on the step, the air rudder is effective, the water drag is equalized, and straight take-offs result.

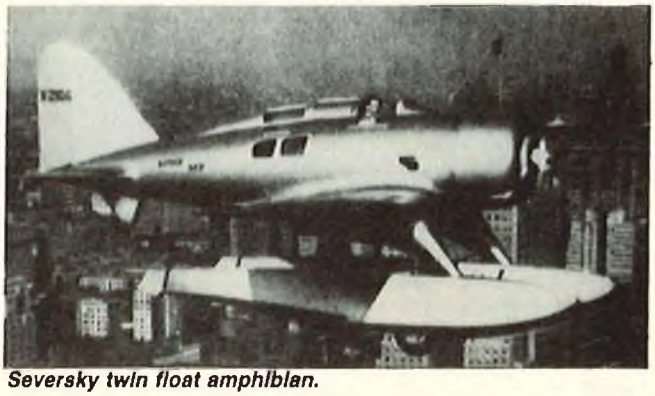
How far down into the water should the dowel extend? Depends on the model. You have to find out by the old "cut and try" technique. Another solution to a symmetric drag of a single water rudder is to put a fixed fin on the opposite float, equal in size to the movable water rudder. Sure, it reduces the effective control of the water rudder, but not significantly, and when you get up to take-off speed, the water rudder will be trailing straight back, just like the fixed fin on the other float, and with the equalized drag, take-offs will be straight.

Now let's look at the take-off problems of single float seaplanes that have wingtip floats, which in many respects are the same as the problems for flying boats, where the hull is in the water and the wingtips are

Dennis Sumner, Dearborn, Michigan, designed this seaplane using Balsa USA twin floats. Note ventral fin.

3/4 view front shows "spread" on floats for good lateral stability on water.

Boeing 314 flying boat with sponsons for lateral stability on water.



Seversky twin float amphibian.

Martin PBM-5 on water-skI.

1/16 Scale Lockheed C-130 "H.O.W." (Hercules On Water) built by Len Purdy.

supported by tip floats.

Tip floats can be attached to the wing wherever the designer thinks is best. For example, the PBY flying boat has tip floats right at the very tip of the wing; in fact, they retract outwards and upwards and become the wingtips, once airborne. Other designs have the floats closer in to the hull, based on the theory that if a float should dig in during take-off, it won't create quite so much yawing drag with a resulting "waterloop." Which is best? Both, depending on which designer you talk to. The proponents of the floats at the very tip will tell you they work much better when maneuvering in cross winds, plus the fact that they can be smaller than inboard floats because the "flotation moment" in cross winds is higher. But, if one of them digs in on take-off, it can cause a sharp veering, or even be ripped off, say the enthusiasts for placing the floats closer in. So, put them where you like the looks, make them a bit smaller if further out, and finally, make the strut length the right length for whatever location you do decide on.

1/16 Scale H.O.W. taking off on water-skI.

And what is the right strut length? The answer to that question is, as always, a bit of a compromise. The shorter the strut, the easier it is on take-off to keep from having a wing dip, make the float hit the water and cause a yawing action; but, if the strut is too short, then, when the model is at rest, it tips over on one wing like a wounded duck and isn't "pretty." Also, with a short strut, when you get cross wind, the wind wants to dunk the float on the downwind panel. So, once again, we come up with a compromise in design. And, once again, here's a rough rule of thumb to follow for starters. When your flying boat, or single float seaplane is at rest in the water (displacement mode) it should tip over slightly to one side or the other, depending on which way the wind hits it, so one float is in the water, and the other tip float is about 1" out of the water (this is for models

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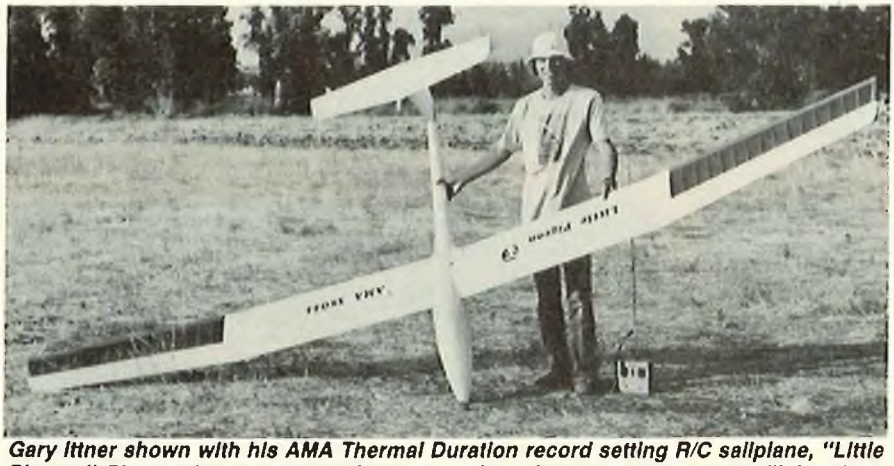
SOARING

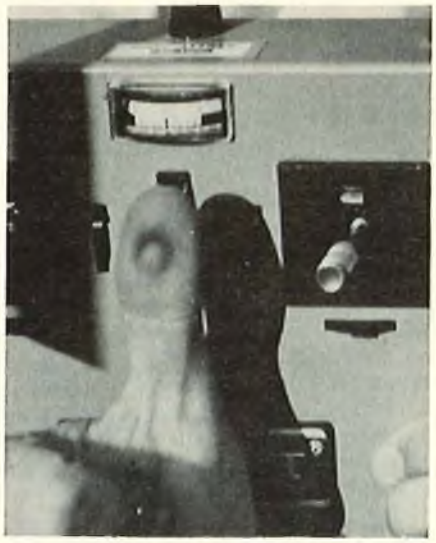
Al Doig



Gary Ittner shown with his AMA Thermal Duration record setting R/C sailplane, "Little Pigeon." Photo taken moments after completion of monumental 8:05:13 flight which explains the large grin on Gary's face. Kraft transmitter by his feet.

From Dave Peltz, of the San Fernando Valley Flyers comes the following: SFVSF member, Gary Ittner shatters U.S. national radio control soaring thermal duration record with flight of over eight hours. Los Angeles, California, Aug 16, 1981, Gary Ittner, age 25, a member of the San Fernando Valley Silent Flyers, today shattered the U.S. national R/C soaring record for thermal duration flight by piloting his self-designed open class R/C sailplane for 8 hours, 5 minutes, and 13 seconds.

Gary's flight was 264% longer than the previous record of 3:10:15 set by Stan Watson earlier this year. Ittner's flight betters Watson's U.S. record by 4 hours, 54 minutes, and 58 seconds.



Close-up photo of Ittner's thumb after flying for more than 8 hours. Circular mark is from Kraft transmitter's aluminum stick handle (in background).

By profession, Gary is a draftsman for an aircraft parts company in Los Angeles. He is also the first alternate member of the 1981 U.S. FAI F3B Soaring team. Gary has achieved LSF Level IV.

Ittner's self-designed sailplane, called "Little Pigeon" is based on a 66" long fiberglass body. The 15' long wing is of polyhedral design and is built in three pieces. The center section uses foam cores, fully sheeted with 1/16" balsa. It contains a spar made from 1/2" x 1/4" spruce, with 1/2" balsa shear webbing. The plug-in tip panels are of conventional rib and spar construction. The wing uses a 16% thick, semi-symmetrical airfoil. The wing area is 1,845 sq. in. (12.8 sq. ft.). The plane weighs 8.75 pounds, producing a wing loading of 10.9 oz./sq. ft. The entire wing is covered with Super MonoKote.

"Little Pigeon" was designed by Gary as a high performance cross country distance sailplane, and was an entry in the 1981 "Great Race." It has three control functions: rudder, elevator, and flaps.

Ittner's airborne radio equipment consists of a 7 channel Kraft KPR-7C receiver, three Kraft KPS-15 II servos, and a very large 4,000 mah nicad battery pack. A 2-stick, 7 channel Kraft KP-7C transmitter, fitted with an external auxiliary battery pack consisting of six alkaline "D" cells, was used on the ground.

Lift conditions were highly varying. During the eight hour flight, Ittner's sailplane achieved a maximum altitude of approximately 1500 ft., and at times was as low as 100' from the ground. The SFVSF uses a "Thermals Per hour" (TPH) measurement to describe lift conditions. TPH measures the frequency per hour of thermal air currents strong enough to, as Gary put it, " . . .take the sailplane from a very low altitude to way up high." During the first five hours, there was a favorable 4-5 TPH condition, which deteriorated to only 2-3 TPH at five hours into the flight. The last three hours were marginal (less than 1 TPH) and were described by Gary only as "low quality scratch."

Gary was ably assisted by other SFVSF members including Mike Bame who acted as official observer. SFVSF member, Mike Reagan was the Contest Director for the AMA Sanctioned Record Trial. While acting as Contest Director for the Record Trials, Mike Regan, himself, made a 4 hour, 1 minute flight from a hand launch. So far, the 1981 SFVSF Record Assult Program has resulted in twenty National Cross Country Distance Records, seven National Thermal Duration Records plus Ittner's remarkable over 8 hour flight, for a total of twenty-eight National R/C Soaring Records set by the energetic California club since May 1, 1981, when their record attempt program began.

★

Dave Johnson, of Portland Oregon, with his K-Minnow.

Got my hat back! Of course, you didn't know it was lost, but it was — for 57 days. The hat is straw, and wide brimmed, and is my constant flying companion. It is festooned with LSF pins, 2 Meter World Cup emblem, and a series of Pacific Island Soaring Society badges for the past four years' contests. After the awards at the World Soaring Championships, I went to the car and took off my hat to remove my camera strap. I set the hat on the top of the car, and drove off — good-bye hat.

In September, I made my annual pilgrimage to Vancouver Island, B.C., to attend the Pacific Island contest. During the Saturday night cook-out my number was drawn, and I was handed a large sack. Inside was my hat. It seems that the Belgians found it, and seeing the Canadian badges, assumed it to belong to one of them. As it was impractical to mail it, they waited for the contest to return it.

Which reminds me of a story. A golfer duck-hooked his ball off the tee. His caddy fished it out of the ditch on the left side of the fairway. The golfer then hit a tremendous banana slice out of bounds on the left side. He dropped another ball and hit it straight down the fairway, then started into the woods to find his first ball. The caddy said, "Why don't you just let it go?" "Don't be stupid," said the golfer, "that is my lucky ball." Anyway — I got my lucky hat back.

The Pacific Island contest was, as usual, just super. I don't know whether it's the people, the scenery, the ferry trip, or what, but it's a great event. The ferry trip, however, now costs $36.00 Canadian, round trip, with car and two people. That doesn't stop people from coming from all over the Pacific Northwest. I had a chance to watch Dave Johnson, from Portland, Oregon, in action. Dave won third in the 1981 2-Meter World Cup event with his K-Minnow, and has been blowing everyone away in unlimited with this ship. His zoom launches are awesome to watch. Dave led the first day, but had to leave, so didn't fly on Sunday. The K-Minnow is a Bob Dodgson design, which he kits. Dave's ship, however, is scratch-built and somewhat modified. He does not use a T-tail and the wing is built-up, instead of foam core. The airfoil is Eppler 193, as is the kit, but was made flat bottomed at the rear instead of the

to page 150

The Dodgson Factory was at the end of a long country road . . .

. . . and down a tunnel of trees.

And at the end of the long road — The Wizard, Bob Dodgson.

Dodgson's fiberglass fuselage molds.

Dodgson foam cutting jig and router jigs.

SOARER

With the exploded interest in R/C soaring, there must be a "zillion" glider designs available today. Many of them, are highly developed and obviously excellent machines. The 2-Meter class seems most popular, especially outside of competitive circles. You probably have one or two in your stable. If so, you realize that this size restriction gives a real cause to search for superior aerodynamics. Comparative research would show that the "boys" have boiled the aerodynamics down to a most successful formula; using this proven data, most 2-Meter gliders have become very similar.

With this story, still another 2-Meter glider is offered. The "Soarer" is obviously a well-proven design, otherwise the effort to produce this article would be stupid. A more positive statement would be that its characteristics and performance have been admired by glider experts --- **it is** a competitive machine.

The objective of this article is to offer you a **different** design. If your mood would be to try a different approach, the "Soarer" offers the opportunity with confidence. In short: "If you have tried the rest, try this one next, you might learn something interesting."

For sure you should never "charge into" something just to be "different." So that you will understand, the "whys" of the design should be explained.

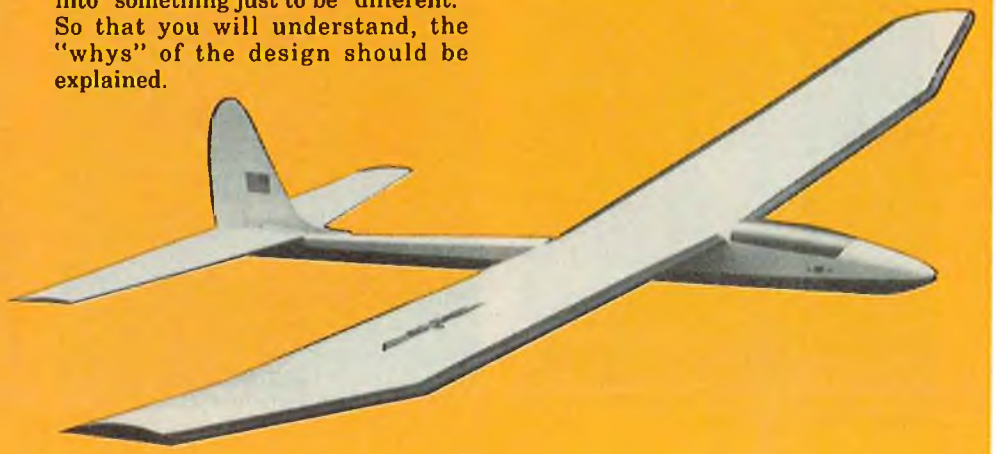
Forty years ago the Sun rose in the morning and set at night. There was an atmosphere and the Sun shown. Many things have changed, but not the things which affect the flight of our models. Modelers were searching for long flights and found them just as hard to come by as they can be today. Maybe the problem was even more severe with those very weak engines and no "hi-starts" or "winches." Perhaps with the shortcomings of those days, we modelers had to depend more upon nature's laws than we do now, with our fine mechanical assists. Perhaps aerodynamics were most important because we had little else to work with.

After watching the local glider group enjoy the sport for some time, an urge grew. First, to join the fun; second, to find out if some of the "old concepts" might work just as well in today's **light lift** conditions as they did back then. The "Soarer" is the result of that urge and is providing much enjoyment --- let's check it out . . .

In those days little was known of "model aerodynamics," but quite a few modelers were experimenting and investigating. Much like today's "Free Flight Society," modelers were working together with people like Frank Zaic, accumulating the fundamental data. This author was in the midst of it and applied the learning to produce some very successful designs. It is those theories which formulate the "Soarer" design and which we will discuss.

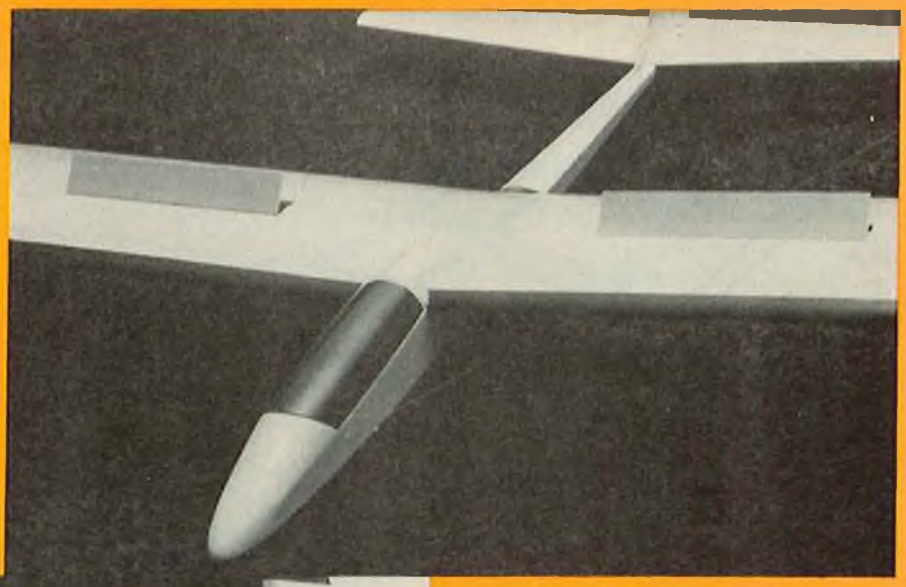
Objective: To produce a non-powered aircraft which can be used to search out rising air and sustain flight as long as possible using it; especially under **light lift** conditions which are so common over most of our country and during the time available to us for flying.

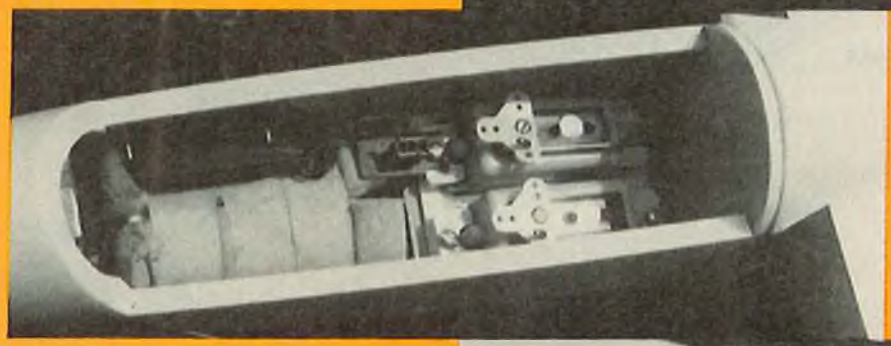
Design parameters: (1) A low rate of sink for duration. (2) Ability to perform in moderate winds. (3) Penetration, ability to search for lift. (4) Strength to successfully use launching methods and to provide longevity. (5) Stability for ease of



By
Hal
DeBolt

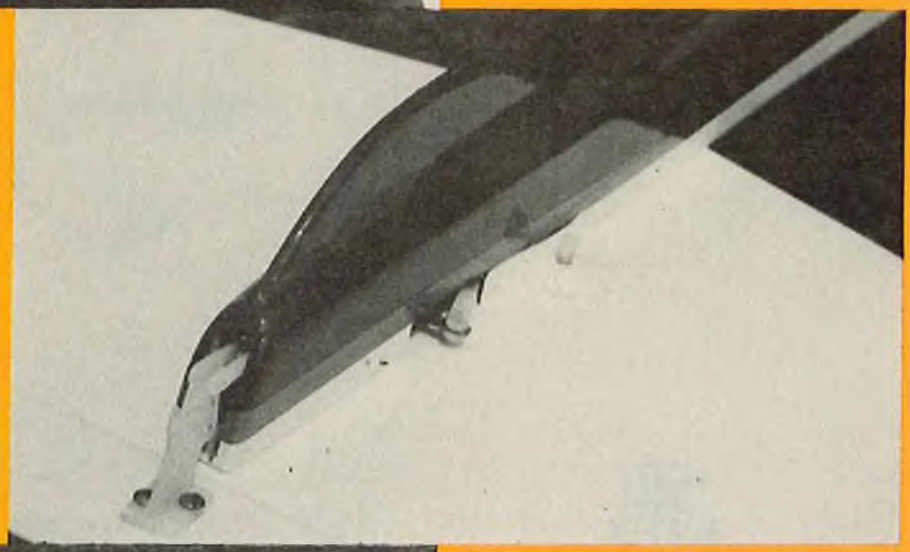
Pappy DeBolt applies a bit of free-flight design philosophy to his 2 meter Soarer

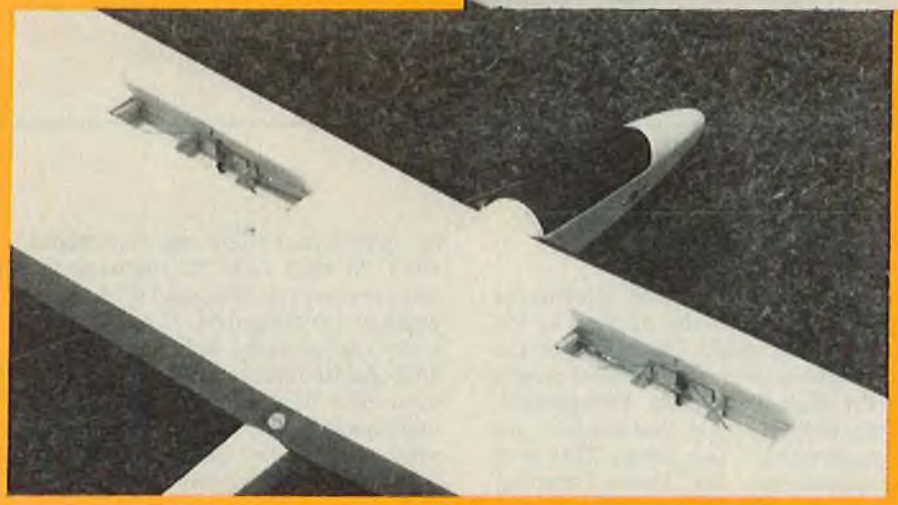




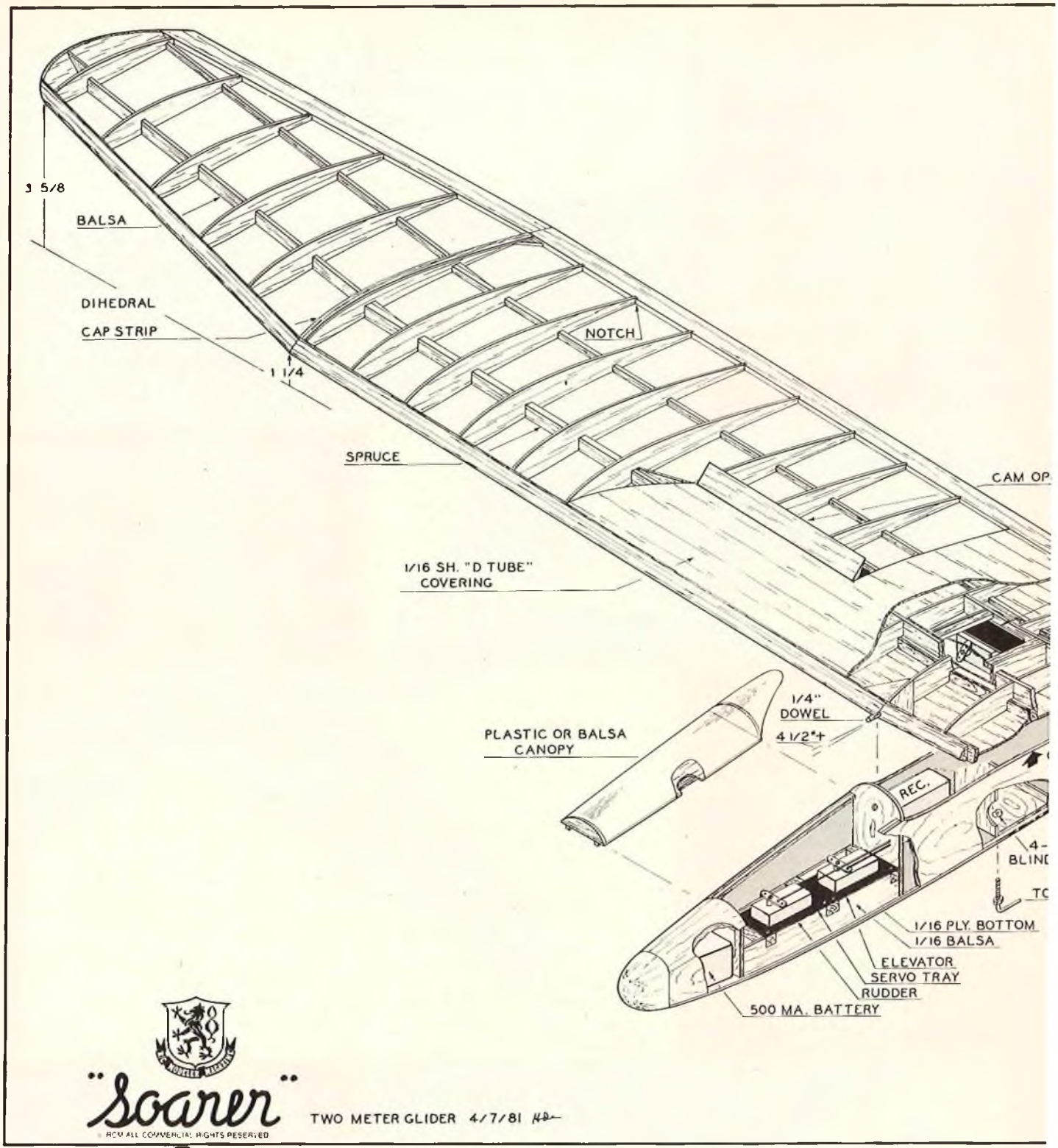
SOARER
Designed By: Hal deBolt
TYPE AIRCRAFT
2 Meter Sailplane
WINGSPAN
78 Inches
WING CHORD
9.85" Avg.
TOTAL WING AREA
768 Sq. In.
WING LOCATION
Top of Fuselage

AIRFOIL
Davis Formula
WING PLANFORM
Constant Chord Center
Tapered Tips
DIHEDRAL EACH TIP
Center Panel 1¼" — Tip 3⅝"
O.A. FUSELAGE LENGTH
45¼ Inches
RADIO COMPARTMENT SIZE
(L) 13" x (W) 1⅞" x (H) 2"
STABILIZER SPAN
30 Inches
STABILIZER CHORD (Incl. elev.)
6½" Avg.
STABILIZER AREA
195 Square Inches
STAB AIRFOIL SECTION
Flat Bottom Lifting
STABILIZER LOCATION
Top of Fuselage





VERTICAL FIN HEIGHT
10 Inches
VERTICAL FIN WIDTH (Incl. rudder)
5" Avg.
REC. ENGINE SIZE
NA
FUEL TANK SIZE
NA
LANDING GEAR
NA
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev., Spoilers
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa & Lite Ply
Wing ..... Balsa, Spruce & Ply
Empennage ..... Balsa
Wt. Ready To Fly ..... 36 Oz.
Wing Loading ..... 6.75 Oz./Sq. Ft.



PLAN NO. 857 ②

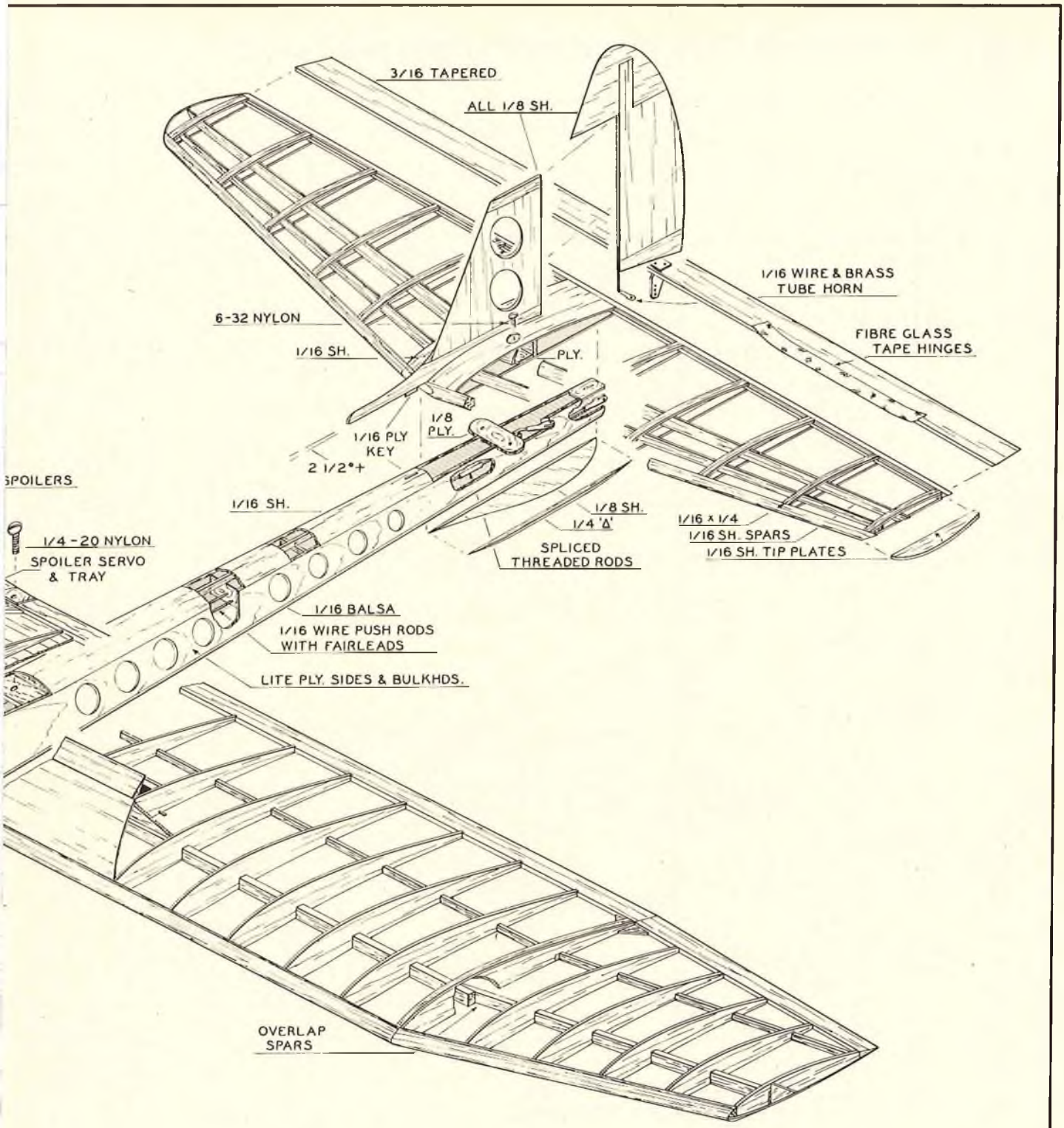
piloting and flight. (6) Controlability — the ability to go where you wish, when you wish. (7) Utility — simple to assemble and with space for common equipment.

These objectives and needs should be met to have an excellent glider, no matter what method might be used. The "Soarer" does it nicely in the following manner.

CONSTRUCTION

Wing:

Any aircraft design should be developed around the wing; it is the heart of the craft. The heart of the wing is the airfoil. The airfoil chosen is of the high lift variety. Fortunately, when properly used, this one also has comparatively low drag. This was developed from the "Davis Formula" for model free flight used in about 1938. At that time its introduction was very, very exciting and it had to be quickly investigated. Comparative tests immediately indicated that if offered a 10% increase in dead air time over the popular 6409. Further experience with it offered even greater improvement. The Davis was and still is an excellent airfoil for duration



FULL SIZE PLANS AVAILABLE — SEE PAGE 203

used.

It is no secret that at our Reynolds numbers, airfoil efficiency increases drastically as chord width is increased. The average glider chord is right in the minimum range as far as serious efficiency loss is concerned in this respect.

Area produces lift and duration. With a span limitation, area can only be increased with chord or multiple wings. With gliders, aspect ratio is widely used to increase wing efficiency. Increasing the chord **reduces** the efficiency. Increasing the chord **increases** the efficiency with the Reynolds effect. Obviously, a trade off is possible here. Increase the chord to get the needed area and let the two efficiency factors balance each other out. The Soarer thus uses a moderate aspect ratio of 8:1 which offers exceptional wing area for a 2-Meter glider. History would tell us that very successful free flights were used with aspect ratios of only 5:1, hence 8:1 is no big deal.

A further note is that lower aspect ratios tend to be more stable and have

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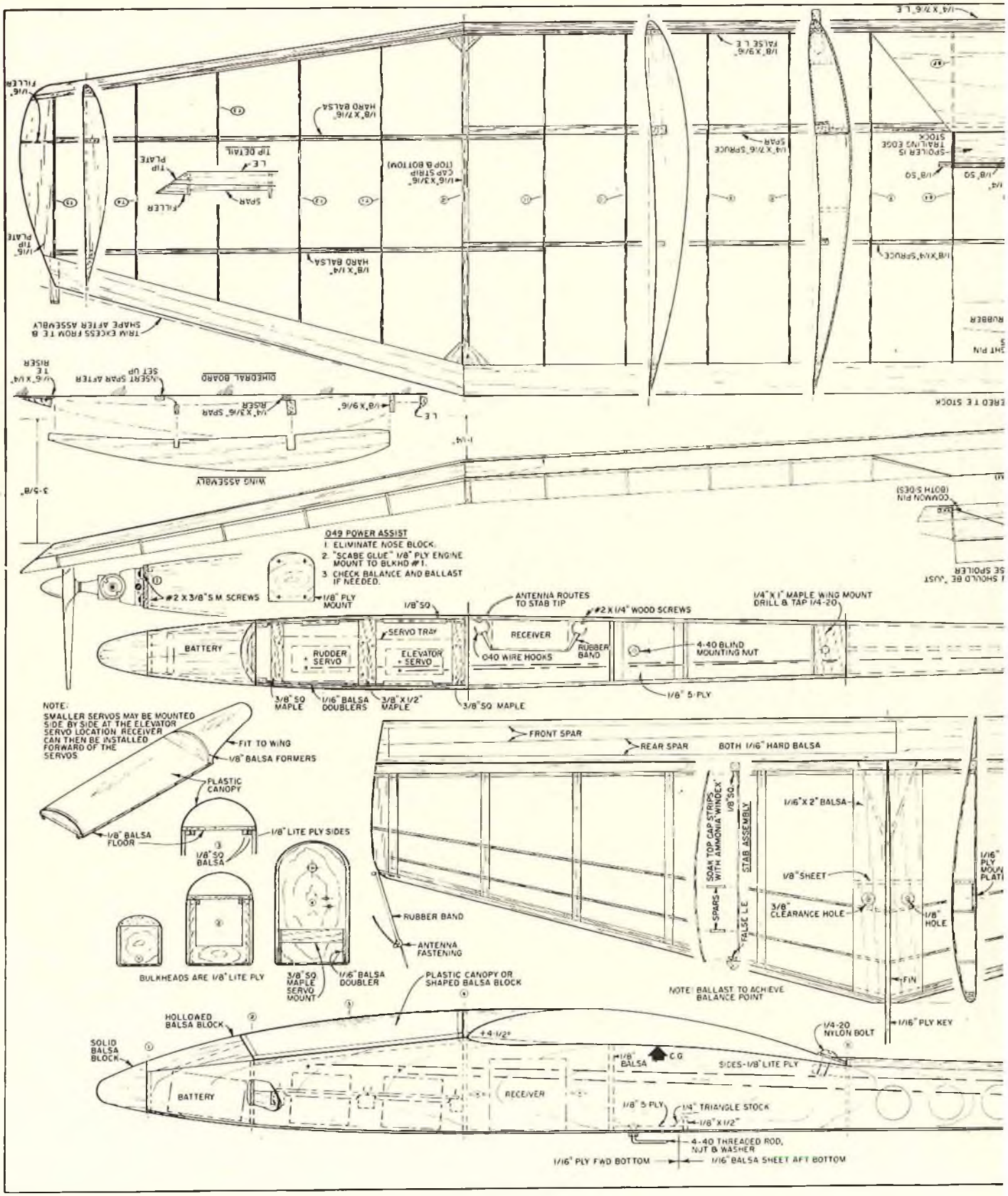
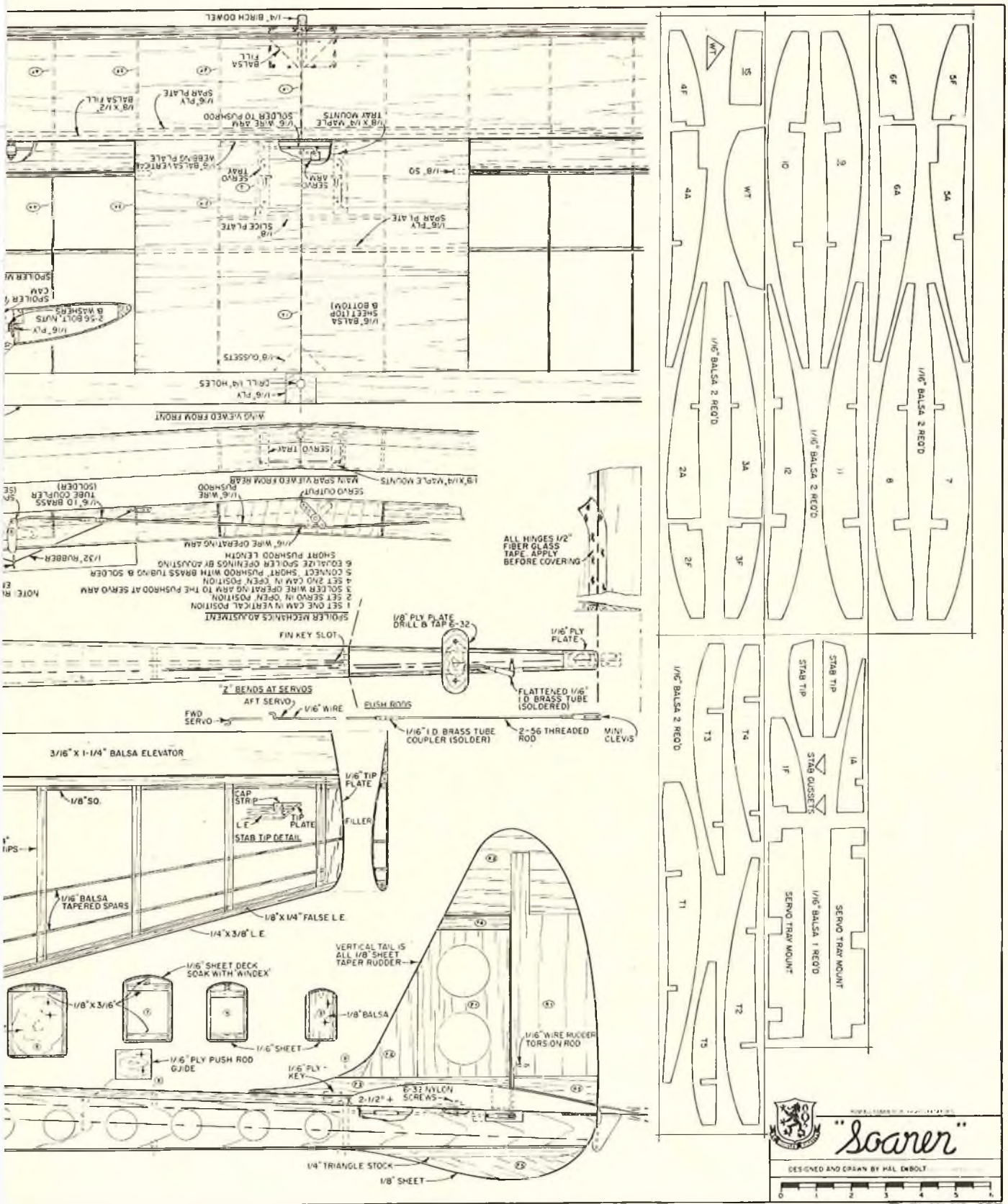
COMPLETE BUILDING INSTRUCTIONS INCLUDED WITH PLAN



FULL SIZE PLANS AVAILABLE — SEE PAGE 203



BIG IS BEAUTIFUL

Dick Phillips

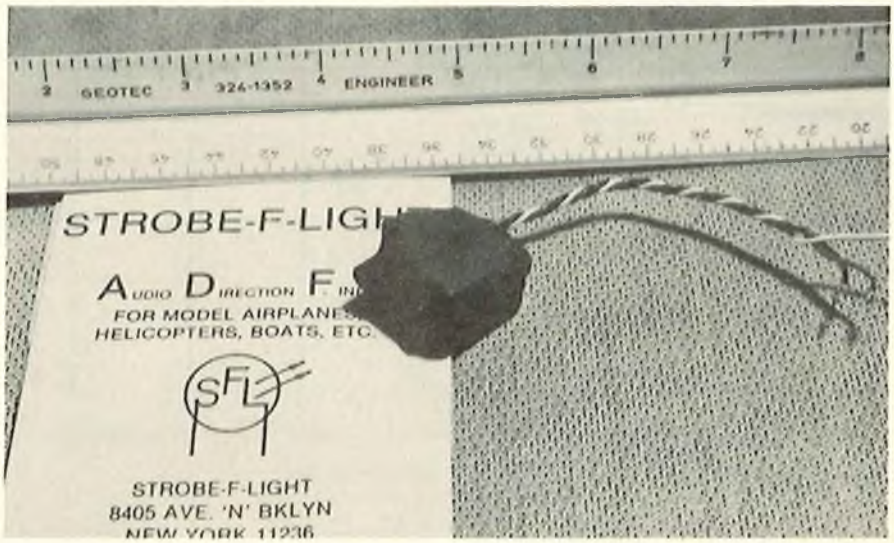
There is a part of our hobby that is often neglected. Something we know, but don't think or talk about that often. This often neglected part of the hobby is one we should all give some thought to from time to time and it would be to everyone's benefit to do so.

What is it? The ladies, God bless 'em. Our wives (and/or girlfriends) are probably the most long suffering group of people in the world. When women get together, the subjects of discussion are usually the costs of keeping a home going, the trials of bringing up children, and other house-wifely items. When two modelers get together, the subject matter is always airplanes. I am sure there are few wives of modelers who have not, at one time or another, gotten fed-up totally with their husband's total dedication to airplanes. We save collections of magazines and cart them with us on every move; we have a collection of plans for models that ranks with us alongside an art collector's treasures; we usually have a collection of reference books; we have an assortment of tools, both hand and power, that would do credit to a well-equipped commercial shop; we mess the house up with balsa dust, paint, odd smells, and messier plastics along with pre-empting the dining room table or most of the living room floor in order to pour over a plan with a modeling friend, and we rarely hear a serious complaint from the long suffering ladies.

To those of you, and there are a few, whose wives participate in some way with you in the hobby, count your blessings, you are indeed fortunate. For the rest of us, well, take the lady out to a good dinner for no special occasion at all and tell her it's because you appreciate her forbearance of the time, money and effort you spend on airplanes and which all subtract from the time and money and effort you could spend on her. Tell her Dick said it would be a great idea!

★

A couple of good things in my mail recently after the restoration of mail service following a six week postal strike in Canada. First to arrive was a new plan from Gerry Behrens (Behren's Plan Service, 31-27 Healy Ave., Far Rockaway, New York 11691) and is a natural for the WW I addict — a Fokker D-VII. The plan is on three sheets; span (top wing) is 88" and the plan is a nice clear, clean rendition of this WW I mount. Construction includes balsa, spruce, plywood gussets and the model is designed for a Quadra engine. Judging by the light, but well-planned construction, it should fly well on the power available. Gerry Behrens has a few other models available in plan form and judging by his future aspirations, will soon have a veritable gaggle of plans available from the **big** builder. Most of Gerry's work could be classified as **classic** and **vintage** aircraft so, those of you who are addicted to such aircraft, drop Gerry a card and ask for a complete listing and prices. He also has a convertible model which can be flown as a mono or a bipe, and while it is not scale of anything, I hear its performance as a sport model makes it worth the extra trouble of building a total of three wings. I now have a couple of Gerry's plans on hand and his workmanship is first class. Gerry has taught drafting so you can bet he does a good job on his plans. The Fokker wing is undercambered as on the original, so no concessions have been made to convenience at the expense of scale accuracy. I, for one, will be watching Gerry's production for more good things — he sure doesn't waste any time. A year ago I had not heard of his work and he has at least five or six plans currently available.



Neat and tiny little accessory from Strobe-F-Light sounds audible warning when receiver is without a signal. Can indicate if someone else is on your frequency and can also help find model lost in the weeds.

Anyone who has been around the scale scene, or followed it for any length of time, will recognize the name Bob Nelitz, which brings me to the second nice thing in my recently restored mail. Bob Nelitz won the World Scale Championship a few years back with a beautifully executed Chipmunk. Most of you will recall having seen pictures of the model here and in other magazines. I had the privilege of meeting Bob shortly after his win when he was honored by MAAC (Canadian equivalent of the AMA). I also had the privilege of picking the Chipmunk up (at Bob's invitation) and admiring at close quarters the fine workmanship he displays.

More recently, you may have seen pictures of Bob's 1/3 Scale J-3 Cub here in the column and elsewhere. Bob has had additional copies of the plan produced and it is available to those of us who do not build as well as he does, but would love to follow in his footsteps. Those of you who have seen pictures of the Cub will know that it is all but impossible to tell it from the full scale in the photos; even to the dummy engine, multi bolt, safety wired prop, working bungee type landing gear, completely detailed cockpit, and so on. Bob does nice work and here is a chance for the rest of us hackers to build as he has done (those of us who have the skills and patience to do so!).

The plan is black-line, on two sheets and is quite large. The span of the

Ron Mangum of Greensboro, North Carolina, built this Sunray which spans 80", weighs 26 pounds and performs well on a Kloritz. Took Best Scratch Built at Louisville Rally in June. Ron has plans available at $24.95. (P.O. Box 8244, Greensboro, North Carolina.)

Very large non-scale model built by Morris Robinson of St. Albert, Alberta, Canada, weighs in at 40 pounds and is extremely sturdy. Barely flies on a Quadra and is having some problems on a 2.44 c.i. Kloritz. Builder calls model, "Dick's Fault" in that it was started after Morris read author's article in May 1977 RCM entitled Big is Beautiful. Local interpretation of the G-AMLR identifiction is, "Giant AeroModelers Loses Reason."

model is 140⅞" which is a bit under 12'. Finished weight should come out around 30 pounds and the original was flown on a Quadra with a 20/8 prop. This 30 pounder will fly very prototypically on a Quadra as there is plenty of wing there to support it. My old 1/4 Scale Cub weighed in at 16 pounds and it was a floater and would take-off at half throttle.

Bob has shown the detail necessary to make a clipped wing version of the J-3 including the strut and jury strut positions for the short wing, and has initiated some very novel and good looking construction techniques. There are a number of innovative construction techniques incorporated into this J-3 and while there are a certain number of metal parts to be made, they should not bother anyone with any amount of 'scratch' building experience behind them.

The Nelitz Cub got ninety flights last summer (fifteen hours flying time) with no problems of any kind cropping up. Bob has installed two flight packs in the model in a rather unique way. One receiver controls the right aileron, rudder, throttle and right elevator, the other RX controls the left aileron, choke, left elevator, and a motor shut-off — all this from the one transmitter. Each flight pack is complete with a 500 ma battery, so the model is flown with 1000 mah on board. Sounds like a neat solution to the worry of having a radio failure in the air. In the example Bob has set up, there would be some control available even if one radio went completely out of service.

All in all, the Ultimate Cub is quite a project and should provide many hours of relaxing flying. I don't imagine it would be a particularly aerobatic model, but would certainly approximate the performance of the standard J-3. It could be a bit agile in roll in the clipped version and I would be tempted to go that route when I build it. A good plan from a pretty well-qualified modeler and draftsman. If a large J-3 appeals to you, drop Bob a line at: Cedarbridge Scale, RR #4, Creemore, Ontario, Canada L0M 1G0.

While I am not very competitively minded, I know there are those of you who are and I asked Bob Nelitz what he thought of allowing the larger model in competition. His response was, "Why not?" Bob Wischer tells me that when he attended the CIAM (FAI) meetings in Paris last spring, there was no discussion of such a prospect as there had been no submission of a rule change to permit the flying of large models in international competition. Both the U.S. and Canada have altered their competition rules to allow the flying of the larger model and it is my understanding that this has taken place. I must admit I have seen no results of anything very large doing well enough to place high in the standings.

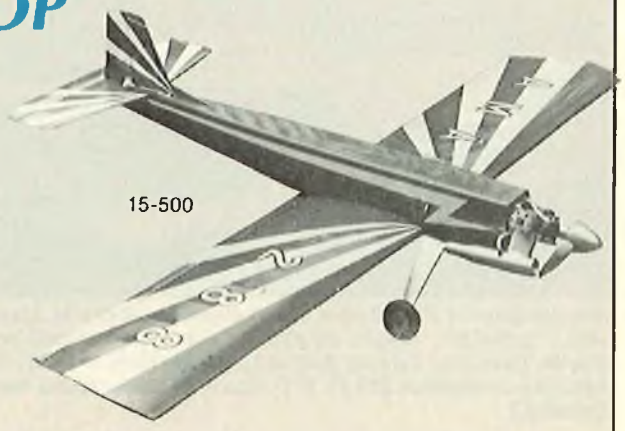
Bob Nelitz seems to think, having met some European judges at the Scale Internats in Canada last year, that there would be some resistance from the Europeans on such a proposal — possibly considering the large model to be potentially more hazardous than the smaller ones. We know that this is just not true from our own experience in that I have yet to hear of anyone being injured by a large model, with the possible exception of a few who have hurt themselves by getting careless in the face of those large props.

There was a very large B-25 crashed at the STARS Scale Rally in Olean, New York, earlier this year which

Recent shot of Doug McBrien's Druine Turbulent on floats. Plans are available from Doug and have been mentioned here previously. Float flying is gaining in popularity in many areas of the country.

Full scale or model? Only the prop gives it away. Great Stinson Voyager is by Realistic Models of Annandale, Virginia. Kit was introduced at Toledo and is well-done. Model shown at Toledo had Lectra-Start on board. Flies very realistically.

THE FUN DOESN'T STOP WHEN THE RACING'S OVER.



If you've ever had the chance to witness Formula One or Quarter Midget racing, you'll agree that the action and speed are breath-taking. But then, so is the cost. And the time they take to build. Definitely not for everyone.

You may have tried racing with your friends, but somehow it just doesn't seem fair pairing a 60 pattern job with a 15 trainer. Seems like everybody ought to have the same size engine and plane, right?

Our 15-500 and Quickest 500 models have been designed for club "one-design" racing with one important added feature: they're as much fun to sport fly as they are to race because of their aerobatic potential. Either one, properly set-up, will fly the complete AMA pattern.

The 15-500 is a marvel of simplicity, building in just a few evenings. It sports a thick 15%, 500 sq. inch wing that makes it a docile handling airplane, though not an overly fast one. Many people build this one without any idea of racing it just because it is so simple.

The Quickest 500 is in the same family, but of a different breed. A thin winged plane with a long, lean fuselage, the Quickest is much faster by design. The shoulder wing configuration aids stability in the turns and wing bolts make a clean design even cleaner. 4 channels and 40 engine are best for this plane.

Both models feature the famous Great Plane machine cut and sanded wood parts, hardware pack, dural landing gear, plans and building notes.

Get your friends together and choose one of these fine Great Planes' designs for your club project. You'll be happy you did—before, during and after the races!

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URBANA, ILLINOIS 61801
217/367-2069

Send for free catalog for more information on the entire line of 35 kits and accessories.

could have been disastrous if the heavy, twin engined model had crashed in the crowd. As usual, good safey practices and flying only in safe areas prevented any damage (other than a massive re-kitting job) and I hear it was pretty spectacular. The remains filled the back of a pick up truck and there were few pieces larger than the engines!

It points up again the attitude I have been putting forth for several years now, we aren't building model airplanes any more, we are building miniature aircraft and our building practices and materials had better reflect that fact, or we will have problems.

Anyway, for those of you who would like to see international competition in the larger sizes, it won't happen until someone starts to make some noise to that end and a proposal to take to the CIAM meetings next year would be the place to start feeling out the temperature of that particular body of water.

Europe is a hotbed of large scale activity and the French magazine 'Modele' rarely puts out an issue which does not include coverage of some large model meet or at least one large model. They also sponsor a tour to the QSAA Rally in Las Vegas which sees 80 plus participants, and on-lookers arrive in October to take in the sights and the meet. Eddie Morgan and a handful of Founders didn't know what they were starting five years ago when the first of these get-togethers was held, as it has grown rapidly ever since.

The European interest in large models may well spark some activity towards international competition and their comparable safety record should allay any fears of large models being dangerous. They are no more dangerous than the people who fly them, so make sure **you** do everything right. Safety **is** 'no accident!'

★

I mentioned Doug McBrien's Druine Turbulent plans here a while back and received the accompanying picture from Doug not too long ago. He was quite serious about flying the Turbulent on floats and as the picture makes plain, it's a saucy looking machine on the water. Doug has had a great deal of flying this year from his two Turbulents and has flown them off land, water and snow in the course of the past couple of years. *(Ed. Note: Doug's float plans will be presented in RCM as a construction article with full size plans available.)*

The Turbulent is 1/3 Scale and still comes out at a reasonable size as the original was not large. Doug's plan set, building instructions and keyed photo set make it an easy to build model and a nice flying machine as well.

A letter from Ron Mangum (P.O. Box 8244, Greensboro, North Carolina 27410) enclosed some pictures of his recently completed Super Sunray (see photo) for which Ron will have plans available by the time you read this. The model is 80" span on the top wing and 72" lower. Weight is 26 pounds and powered with a Kioritz engine. It should be quite a performer at that weight on the Kioritz. Ron won best scratch-built at the regional fly-in at Louisville in June and judging by the pictures, it's no wonder. Plan is available from Ron at the above address for $24.95. Lots of prop clearance on this one and engine cooling would certainly not be a problem.

Tatone and Quarter Headquarters have added some new items to their line-up recently. A Giant Scale choke assembly for both Walbro and Tillotson carbs is available at $8.95. This is a good looking piece of mechanism and is made from aluminum and brass, not plastic so should stand the test of time well. The choke lever is spring loaded so it appears to be hand operated, but I

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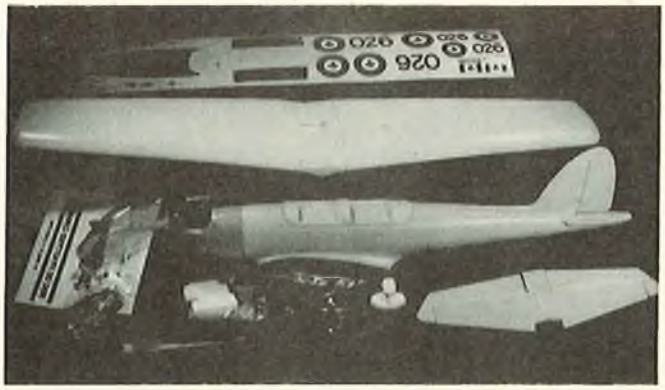
RCM PRODUCT REVIEW

Model Rectifier Corp. DEHAVILLAND CHIPMUNK



SPECIFICATIONS

Name	DEHAVILLAND CHIPMUNK
Aircraft Type	Sport Scale
Manufactured By	Model Rectifier Corp. 2500 Woodbridge Ave. Edison, New Jersey 08817
Mfg. Suggested Retail Price	$114.95
Available From	Retail Outlets
Wingspan	41 Inches
Wing Chord	6¾" (Avg.)
Total Wing Area	276 Square Inches
Fuselage Length	30½ Inches
Stabilizer Span	15½ Inches
Total Stab Area	62 Square Inches
Mfg. Rec. Engine Range	.09
Recommended Fuel Tank Size	Pre-Installed
Recommended No. of Channels	3-4
Rec. Control Functions	Rud., Elev., Throt., Ail. (opt)
Basic Materials Used In Construction:	
Fuselage	Foam & Ply
Wing	Foam
Tail Surfaces	Foam
Building Instructions on Plan Sheets	No Plans
Instruction Manual	Yes (11 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Cannon Sport 4
Engine Make & Displacement	Enya .09 Installed
Tank Size Used	2½ Oz. Installed
Weight, Ready to Fly	33.75 Oz.
Wing Loading	17.6 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Good packaging, complete hardware, good quality foam molding, very good instructions, ease of assembly.

WE DIDN'T LIKE THE:

See text.

The MRC DeHavilland Chipmunk is a .09 powered, almost ready to fly, three or four channel sport scale model. This product is molded entirely of styrofoam. The 6" x 8" x 41½" box contains everything you need to complete assembly, except adhesives and a radio. Even the engine is included. The quality of packaging is good. The major components are held in place with cardboard. All the smaller items are bagged in plastic to prevent shifting. The Chipmunk is beautifully molded and painted. We liked the rib detail molded into the flying surfaces. The bright yellow paint and Canadian markings also help make the model look realistic.

Construction:

As this is a RTF, there is nothing to construct. A well-written eleven page, photo illustrated instruction booklet is provided to assist in assembly. We chose to install optional ailerons. This conversion involves very little extra effort and all the hardware is provided. All you have to do is follow the instructions. No major problems were encountered during assembly which took about seven hours.

Covering:

No covering or painting is necessary. The plywood firewall looks like it could use some additional sealing as it appears to be bare wood. The mylar stickers went on very quickly and stayed down when exposed to fuel. The yellow tailwheel is annoying and should be molded from some other color!

Engine:

An Enya .09 R/C engine with muffler comes factory installed. Getting precise throttle response proved a bit tedious as there isn't much room to maneuver inside the tight cowling. Perseverence and a pair of needle-nose pliers solved the problem. The 2½ ounce clunk-type fuel tank comes already in place.

Radio:

A Cannon Sport 4 with standard size servos was used in our test model. The only gripe in this area was that the holes in the plywood servo tray were too big. Needless to say, almost any radio will fit in the ample fuselage.

Flying:

Completed, our Chipmunk weighed 33½ ounces dry. No additional ballast was required to get the proper Center of Gravity. The Enya .09 was broken in as per instructions. When it wouldn't idle we checked the plug and found it did not have an idle bar. Switching to a plug so equipped improved low speed performance greatly. No control throws are given so we set her up as follows: rudder 1/2" either way, elevator and ailerons, 3/8" up and down. Ground handling is good even though that obnoxious yellow tailwheel isn't steerable.

On take-off, the Chipmunk tracks arrow-straight. This is definitely not one of those tail draggers! In the air the model looks very realistic. The Enya hauls the freight quite well. Best of all, that 2½ ounce fuel tank lasts a long time.

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POWER BOATING

Howard Power

boat (bōt) *n.* a hole in the water surrounded by wood into which one pours money.

The nice thing about R/C boating is that you can easily involve your family. Most lake settings not only provide water for running but an enjoyable place that the wife and kids don't mind going even if they aren't involved in the hobby. If you are smart, however, you might try to get the wife and kids more actively involved. Be forewarned, however, that the gentle sex can be fiercely competitive and they usually turn out to be excellent drivers and winners. It's much safer to introduce the kids to our sport!

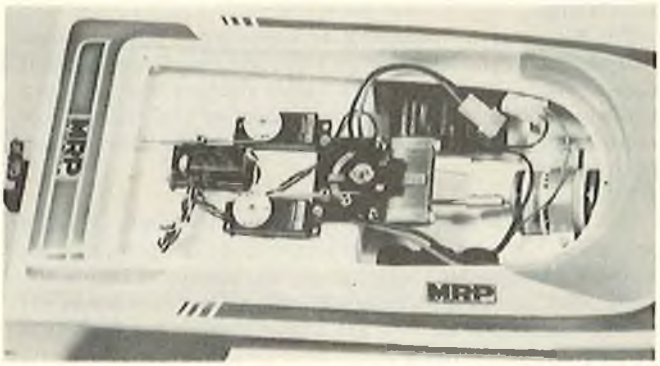
One problem associated with introducing the family to boating is overcoming the natural fear of hurting dad's boat. Power boats also create lots of noise which tends to discourage the most brave members of your family. What you need is a fun, pretty fast, quiet boat to teach would-be boaters the basics. A new deep vee sport electric boat has been released by the people at Model Racing Products (MRP) that might solve the introduction to boating problems. The boat is available in three models; the number 992 kit ($49.95) includes the basic hull less motor, batteries, speed control and radio; the number 991 kit ($122.00) is semi "ready to run" since it is supplied almost completely assembled and includes everything you need except for a two channel radio; and the number 990 kit is "ready to run" with a Futaba two channel radio included.

The V-Sport boat has a good looking 20" long ABS plastic hull and hatch that is very light so performance of the boat is very good. I'm not exactly a high performance electric boat expert but I estimate that this boat has a 20 mph speed capability which makes this boat really fun. I started with the almost RTR 991 kit because it has all the parts necessary to get the boat running except the radio. (Besides, I'm really lazy.) The boat has a novel styrofoam block arrangement already mounted in the hull to which the servos and receiver are mounted by pushing them into pockets cut into the block. The speed control rheostat is then mounted to the two servos by attaching it to the mounting lugs of the servos. The stuffing tube and drive line are already mounted so installing the electric motor is very simple. It only took me one hour to get the boat ready to run and half the time was spent making putt-putt noises while I worked!

The electric motor appears to be the 05 type used in 1/12 Scale electric cars. The batteries supplied are six sub C size GE nicad cells that are wired and potted for protection in case they get wet. The boat even comes with a fifteen minute charging cord that allows quick charging at the lake using your 12 volt automobile battery. The rheostat control gives proportional forward and reverse speed control. What appears to be a Dumas nylon prop provides the forward push. Unfortunately, I had to wait for the weekend to try out my new toy. On Saturday I found that the boat ran surprisingly fast, was capable of small radius turns, and its V bottom hull allowed it to handle relatively rough water. I would have run the boat more but my six year old daughter, Kathy, decided that dad had run her new boat long enough. To make a long story short, the boat is easy enough for a six year old (maybe a very exceptional one?) to handle, but fast enough to teach the basics of boat racing. The boat is lots of fun and I recommend it highly. I only have one caution, however. The motor speed will go as fast in reverse as it does forward. However, the boat cannot go full speed in reverse without filling the hull up with water. I would suggest wiring a fixed resistor in series with the speed control so that reverse speed is limited to a slow backing speed.

★

In the June issue of RCM I introduced the Fly-by-Night Boat



Works electric glow plug wrench as a joke. It seems that one guy out there didn't think it was funny, but had already decided that this was just what us boaters needed. I just received a call from Bob McDaniel of McDaniel R/C Service, 13506 Glendundee Dr., Herndon, Virginia 22071, (703) 435-5805, who wanted me to test a brand new gadget he calls the BO-STARTER™.

He has been making the NI-STARTER™ for the airplane crowd for quite a while. This device is a HEAD-LOCK™ glow plug adaptor married to a sincle C cell size nicad battery. The NI-STARTER™ has been enthusiastically received by airplane fliers but many of us boaters start our engines with the glow plug loose to reduce starting loads. The NI-STARTER™ won't work if the plug is loose because the head lock won't let the glow plug go. Bob has made two changes to his NI-STARTER™ to make his new BO-STARTER™; the plug adaptor is made of heat treated steel so that the adaptor with its "T" handle turns into a plug wrench, and the HEAD-LOCK™ feature has been removed so you can remove the battery after tightening. To quote the information sheet that Bob sent along with the battery: "This device is designed to supply power for glow plugs used on model boat engines, and incorporates a special adaptor, made of steel and shaped so that it fits a glow plug in a manner which allows the loosening and tightening of the plug for lower compression starting, without switching from starting power source to a plug wrench to lock the plug down after engine start. The spring loaded center electrode is designed to retract far enough into the adaptor to allow the downward pressure necessary to tighten a glow plug, and yet not fail to maintain good electrical contact from that pressure. The steel casing allows for sufficient torque pressure to be applied to adequately lock down or loosen a glow plug without distorting. The steel rod supplied can be inserted in the holes located along the steel shaft, and is used to apply additional torque pressure to insure lock down, or release of the plug. The charger, supplied with the BO-STARTER™, is modified to supply charging currents in the C/20 charging range, at the voltage necessary for adequate charging of the nicad battery attached to the power wrench. Charging of the BO-STARTER™ is accomplished by inserting the charging plug to the wrench end just as you would a glow plug and rotating. Charge rate is approximately 1.5 volts D/C at 50-60 ma/hr., and should charge your BO-STARTER™ in 24 hours (charger can be left on indefinitely without harm to battery). Depending on length of time the battery is actually driving a glow plug, you should normally get more than fifty consecutive starts from the BO-STARTER™ before recharging becomes necessary. Longer starting times will reduce that number somewhat. You should be able to recharge hundreds of times, which means you can use the BO-STARTER™ for years, and quit buying those batteries that you throw away when they become discharged."

It sounds too great to be true but this darn thing works. You may have to change your starting habits a bit because you must hold the BO-STARTER™ on the glow plug. This is necessary because once the engine starts, vibration dislodges it. I tried it and I like it. The battery lasted through two days of hard use without charging. They are now available direct only and will soon be at your local hobby shops. Retail price is $29.95. The thing even has a 90 day guarantee. After that, if anything fails they will repair it for $9.00 up to one year after date of purchase. Bob also sent me a prototype quick charger that may be used to recharge the BO-STARTER™ at the pond. The device plugs into your cigarette lighter socket and it is capable of charging a discharged BO-STARTER™ in about 20 minutes. Like all quick chargers it is very important that you do not overcharge the battery. This type of charger is not for everybody because forgetful modelers will melt down their batteries in short order! If, however, you pay attention to charge time, this unit will be a very useful device to own. It should retail for about $10.95.

★

Dear Howard,

Thanks for the interesting articles in RCM on boating. It is because of these that I have become interested in boats. I have a problem which might be peculiar to Australia, but as a lot of Aussies read the magazine it could have some general interest.

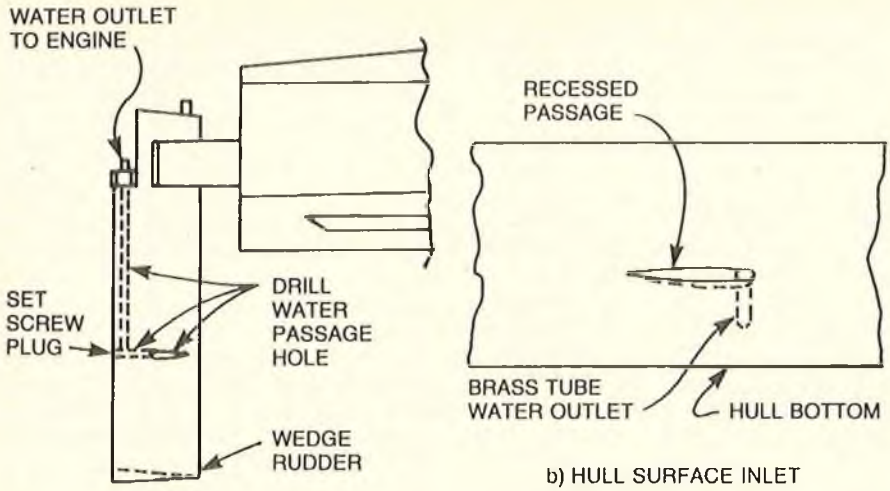
I live in an inland town in New South Wales and I am endeavoring to start a boating section in our model aircraft club, and to improve the competition I felt that a good idea would be to standardize on a 20 to 3.5cc motor. I already have a Graupner runabout powered by an O.S. .20 but I would like to run a K & B outboard in order to get rid of the bilge oil and to simplify fitting.

Now to my problem, first the motor. Here in Aussie we rarely use nitro in our fuel as it is quite scarce and very expensive. In the pattern and scale models I have been flying in the past using O.S. .40's and piped .60's, it has not been really necessary but I am told that the little K & B has to run on nitro. First question, can I modify it in some way so that it will run on straight 4 to 1 mix? If so, what mods should I perform? Second, I realize that such hulls as the Hot Shot tunnel perform best with these motors but I would prefer to run a Deep V runabout style boat always providing I am not giving too much away in performance. Second question, what would be a suitable hull? One of the considerations is so that the local water ski population could relate to the boats and maybe become interested in R/C boating. I regard this as my first real sport boat so any hints and tips on setting up, trimming, etc., would be very much appreciated. I have written to Clarence Lee also on the motor problem, hope this is in order. In your July column you mentioned a flush water inlet. How does this work? Incidentally, we are two months behind in receiving RCM. Thanks in anticipation.

Ken Wyld
New South Wales, Australia

The K & B outboard does not have to have high nitro fuel to run. It will run fine on FAI fuel. It was designed with high nitro fuel in mind so its combustion chamber and timings were optimized for such a fuel. In general, engines that are designed for high nitro fuel will run pretty well in their stock condition using FAI fuel. Their performance may be improved, however, by modifying the combustion chamber. When nitro is not used in the fuel the compression ratio of this engine could be increased. This may be accomplished by lowering the deck height (the distance between the squish band of the head and the piston at top dead center). The K & B 3.5 engine has a .015" deck height. You could reduce the height to .010" by either taking .005" off the head seat or by taking .005" off the top of the brass liner. Further reductions of deck clearance will increase power but as the motor gets older the clearances present in the crankpin, wrist pin, and crank bearings might allow the piston to hit the head at high revs. I would recommend that you make a new head with a hemispherical combustion chamber that has a smaller volume than the stock head. You will have to experiment with different volumes but a reasonable rule of thumb is a 20% reduction in volume from the high nitro head. If you have reduced the volume too much you may damage the glow plug every time you run and the needle valve settings will become critical.

I think that your idea of running a V bottom outboard hull is sound. Almost any Deep Vee inboard hull may be modified and can be successfully run



a) RUDDER INLET

b) HULL SURFACE INLET

FLUSH WATER INLET

with the outboard. I happen to like to recommend the Westcoast Marine Stingray Deep Vee hull because of its enviable contest record and excellent performance.

A flush water inlet is a water pickup system that is built into the hull or rudder surface so that no protrusions are present in the water stream. This reduces the form drag caused by conventional water pickups that protrude into the stream. You can make a flush inlet by providing for a recessed tunnel leading to the water inlet opening as shown in the figure. These flush inlets work great.

Dear Howard,

I've been going to drop you a line since the June issue of R/C Modeler came out. I read of the trials and tribulations of Bob Swayer of St. Albans, Vermont, his PT 109 boat and the performance on electric motors. Well, I decided to build an electric powered model also and built the Dumas American Enterprise, twin screw, powered by two Dumas Pittman 6 volt motors. I installed two battery packs of nicad D cells, and was very disappointed in the speed. It got up to about 5 mph and about twenty minutes running time. Being dissatisfied with this performance, I tried uping the voltage from 6 volts to 9 volts. The reason I did this was that under load at 6 volts, the voltage went down to 4 volts, at 9 volts under load it was 6 volts, so at the 9 volts I got about 8 mph on my boat.

I was still dissatisfied and the only thing I could think of was that I was going to have to go to a gear box, but not knowing whether or not I would be satisfied with its performance after investing the price of a gear box, and having a used O.S. .49 motor on hand, I got to thinking — why not use this motor as a pusher, and save the electric twin screw motors for use only if the gas motor should conk out? I took the rear overhang off of the American Enterprise model I had built as an electric model and shaped a piece of two by six exactly the same as it was built up originally. Now I had a solid base to which I put two 3/8" rods threaded on lower ends to give me a base on which to mount my pusher gas motor. I built a gas tank platform just behind the pilot house to set a 16 oz. gas tank on. It has proven out to work very well. The engine will run about thirty minutes at full throttle. Because of the torque of the engine I had to move the batteries several times to get them in the right place to counter the engine torque. I also had to do some experimenting with different weight springs on the two drive shafts so that when the boat was in motion it would (by the drag of the propellers through the water) let the drive shafts slide to the rear. If the gas motor should conk out, the springs would slide the drive shafts forward 3/8" so both could engage so I could bring it in on electric power. It took a lot of time to get it to work the way I wanted it to, the only thing is if I bring it in on electric it has a slight list. I am very happy with the boat now. It will do about 25 miles per hour and after 30 minutes of running I can now refill tank and sail all day if I wish to. I might add it is very stable using a 10/6 two or three bladed pusher type prop.

If there is anything further that you would like to know, I'd be happy to hear from you. Enclosed are some photos I've taken. Wish I had a camera that would take better pictures on the water when it's running. It's a pretty sight. In conclusion anyone going electric will be disappointed in the performance but I'm happy I have both electric and gas. When one goes out I can use the other. I don't have a boat big enough to carry me out to get it and I don't swim good!

I always enjoy your column in R/C Modeler so keep up the good work. By the way, Howard, I'm 63 years old and have been a model builder for many years and hope to continue for many more. It keeps me young.

I remain,
Kenneth W. Ring
San Antonio, Texas

It's nice to get letters that relate your solutions to boating problems. I would like to encourage more of you writing letters describing things that work for you and that might help others to be successful.

Mr. Power,

In my new Hughey .20 outrigger I have installed a new K & B .21 inboard marine engine. I couldn't get the engine to run with the stock muffler so at the suggestions of a few boaters at

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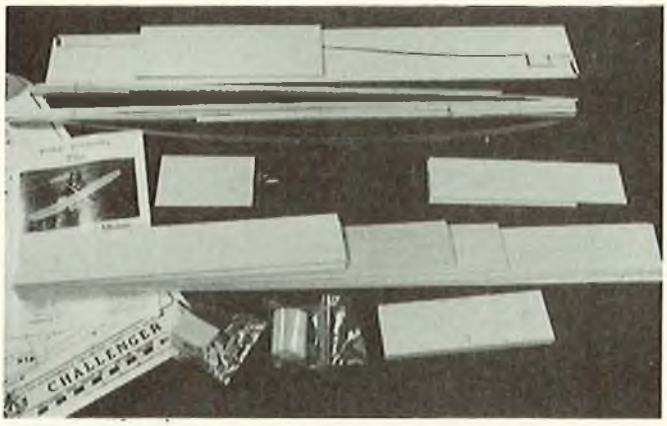
RCM PRODUCT REVIEW

Precision Model Prod. CHALLENGER



SPECIFICATIONS

Name	CHALLENGER
Aircraft Type	2M Competition Sailplane
Manufactured By	Precision Model Products 21489 Coldsprings Lane Diamond Bar, California 91765
Mfg. Suggested Retail Price	$49.95
Available From	Both Mfg. & Retail
Wingspan	78½" (2M)
Wing Chord	8 Inches
Total Wing Area	590 Square Inches
Fuselage Length	40½ Inches
Stabilizer Span	24 Inches
Total Stab Area	96 Square Inches
Mfg. Rec. Engine Range	NA
Recommended Fuel Tank Size	NA
Recommended No. of Channels	2
Rec. Control Functions	Rudder & Elevator
Basic Materials Used In Construction:	
Fuselage	Balsa & Ply
Wing	Balsa & Ply
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (6 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Kraft
Engine Make & Displacement	NA
Tank Size Used	NA
Weight, Ready to Fly	30 Oz.
Wing Loading	7 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Glossy paper plans, drawings of both die-cut and balsa sheets which showed how each piece was used.

WE DIDN'T LIKE THE:

Custom pushrods — they do not take standard hardware.

The Challenger is a high performance sailplane designed for multi-task competition and, if you so desire, is great for fun flying. The wing has a wide performance range Eppler 205 airfoil, T-tail and a slender sleek fuselage. The canopy and wing lock into place with one nylon bolt. The Challenger is a well-engineered, neatly packaged sailplane with smooth beautiful lines.

Visibly, we were immediately impressed by the label on the cover of the box. There, the yellow, white and orange sailplane was exceedingly well-presented by a lovely young lady kneeling in a green field full of yellow flowers — very eye catching.

The interior of the box was as well-presented as the exterior. All of the hardware necessary to build the plane was enclosed in a plastic bag as were the ready cut wing spar webbing pieces. The die-cut ply fuselage sides were packed flat on the bottom of the box so they would not take on a banana contour. The excellent quality balsa sheet and sticks were neatly packaged for minimal warping. The wing tips and wing contours were printed on a 5/8" balsa block for the builder to saw out; there were no pre-sawn pieces in the kit. The die-cutting, both in ply and balsa, was sharply done and punched out cleanly.

We were very impressed by two pages in the instructions, one that showed and identified all die-cut pieces, and the second showing the balsa sheeting and how every part was cut from these sheets. It sure saved the waste of having to buy more balsa because you cut the sheet wrong. Identification of all parts was a snap.

Construction:

The plans are beautifully printed on a high gloss black paper and are a joy to behold. The uppermost wing half is printed upside-down so you can turn the plans around and not have to work across the whole width; this is becoming more and more standard and should have been done years ago.

There is one 45" x 36" sheet of plans and an instruction folder of six pages. The instructions are also printed on glossy stock and include many excellent quality black and white construction photos.

The Challenger is not for the beginning builder. For example, the only part of the wing that touches the plans while building is the bottom spar. Everything else is blocked up to keep the Eppler 205 airfoil true. We found it necessary to put 3/32" strips under the leading edge in a similar manner to the called out 1/8" strips under the trailing edge. This centers the ribs on the leading edge so there is room for the sheeting on top of the ribs and cap strips on the bottom. Nowhere in the instructions could we find mention of blocking up the leading edge. We do like the construction method as this is a hard airfoil to put into a built-up wing.

We were impressed by the engineering of the fin and method of transmission of movement from the servo to the all-moving stab but, as mentioned elsewhere, the inner

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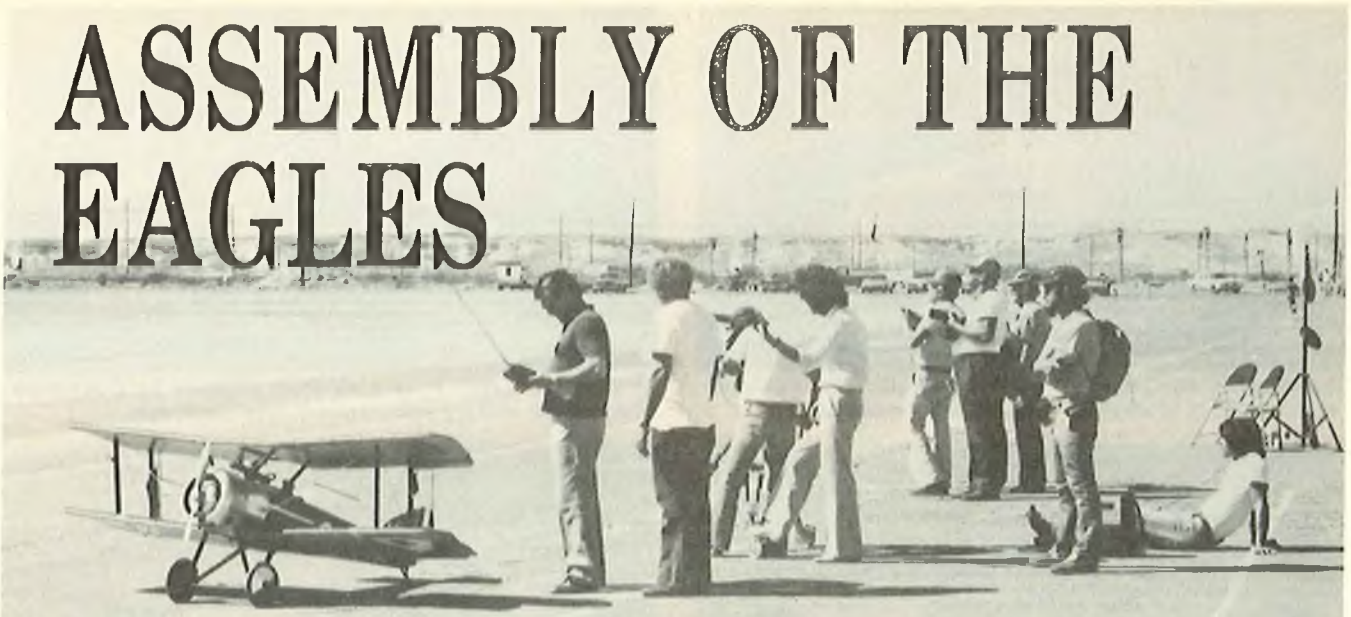
ASSEMBLY OF THE EAGLES



1981 Q.S.A.A. LAS VEGAS FLY-IN

By Dick Phillips

October, 1981, found the Fifth Annual Las Vegas QSAA Fly-In being held at a new location. Through the cooperation of the Las Vegas Convention Center, the huge paved parking lot of the Silver Bowl Stadium was made available for this Fly-In which probably enjoys the largest attendance of any single type model event in the USA.

More than 500 people attended the banquet with a pilot registration exceeding 140 who brought over 180 aircraft. Add several thousand spectators who traveled to fun city to enjoy the modeling as well as the pleasures of Las Vegas and you have a really big show.

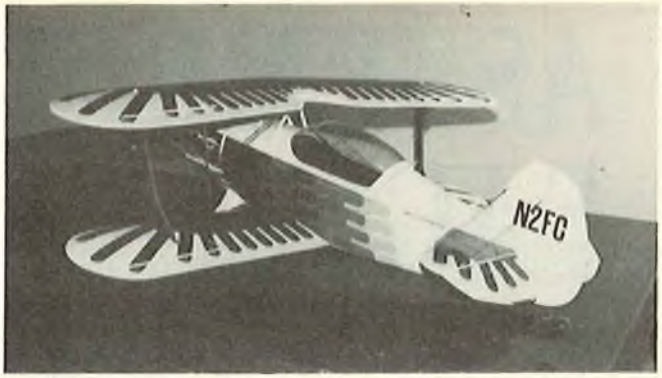
At this point we wish to recognize that an event of this magnitude does not just happen. Many months of planning and coordination by a dedicated hard working group of Las Vegas modelers make it happen. We extend our appreciation to those modelers, the Las Vegas Convention Center, and the management of the Showboat Hotel and Casino for making the Las Vegas QSAA Fly-In possible.

The registration and display of the models took place at the Showboat Hotel and Casino which is a well-kept hostelry. The facilities are typical of a first class Las Vegas hotel. A large room is made available each year for the static display of models and is a chance for the builders to show off their handiwork and tell tall tales of their exploits.

The Silver Bowl Stadium is the home of the Las Vegas professional football team and is located on the edge of the city, only seven miles from the Showboat Hotel. This is about 25 miles closer than the dry lake formerly used as the flying site and the paved parking lot was a distinct improvement over the dusty lake bed. The weather conditions were pleasant on Friday and up until mid-afternoon on Saturday when the winds came up pretty strong. For unknown reasons the wind direction shifted about 90° from the usual prevailing winds and caused a bit of consternation for take-offs and landings.

EVENT	WINNER	MODEL	TROPHY SPONSOR
Best of Show	Bob Nelitz	Piper J-3 Cub	R/C Modeler Magazine
Best of Static	Dick Enos	Lockheed Vega	Sig Manufacturing
Best of Scale	Darrel Cline	P-51D	Kraft Systems
Best Finish	Robert Gillespie	Fairchild F-27	K & B Manufacturing
Best WWI	Joerg Vogelsang	Sopwith Pup	Carl Goldberg Models
Best Military Scale	Don Martin	B-17	Kraft Orange County
Best Stand-Off Scale	Tom Bunker	Zero	Model Airplane News
Best Biplane	Chuck Fuller	Stearman PT-17	Coverite
Best Multi-Engine	Bruno Gottfried	Lockheed L-1649 Constellation	Bridi Hobby Enterprises
Best Scratch-Built	Mel Barber	DH-2	Billy Root
Best Junior Entry	Eric Richard	Piper J-3 Cub	Summa Corporation
Best Mech. Achievement	Christian Taschet	Fieseler Storch	Larry Vance
Powder Puff Award	Connie Vaughn	Rearwin Speedster	Budweiser-Michelob
Crap Shooter Event	Chuck Fuller	Stearman PT-17	Circus Circus
Marathon	Ed Hess	Mr. Mulligan	Du-Bro
Longest Distance	Mel Barber	DH-2	J & J Hobbies

A completely detailed Super Chipmunk kit from Don's Custom Models, built in 30 days by 15 year old John Bashore.



A Christen Eagle II, is a kit from Higgins by Contempo Enterprises. Kits are now available from Contempo.

Available from Contempo Enterprises, 11611 Cantara St., North Hollywood, California 91605, is this CAP 20.

One of the five CAP 20 models at the Fly-In. Sorry we don't know who owns this one.

Cessna Skymaster by Dixon New. Weight is 35 lbs. with two Quadras.

There were nine Citabria's at Las Vegas. Identity of the builder of this one unknown.

Don Runnell's well-known Fleet Trainer from Southern California, getting a last pre-flight check.

John Greenfield, London, England, brought his 1912 Blackburn. Span is 94", weighs 14 lbs., and is powered by a 2.2 Kawasaki.

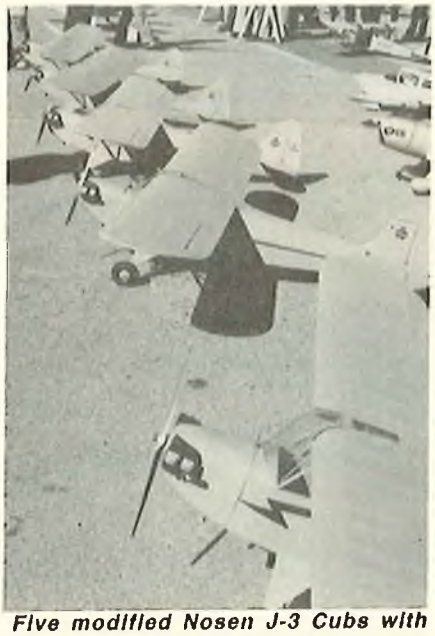
The flight activities were cancelled on Sunday due to the wind and the trophy awards were made within the shelter of the stadium. The wind situation was unfortunate but even NASA hasn't figured out how to control the weather.

A special treat was provided by Darrell and Merle Meyer. They brought their Hughes Hercules (Spruce Goose) up from the Los Angeles area and, with John Elliot at the controls, put on a spectacular demo flight at nearby Lake Mead.

South Africa, Germany, France, and Canada, were again represented by outstanding models, some showing technical abilities beyond what might be expected. For example, Joerg Vogelsang of Germany, showed his Sopwith Pup powered by a home brew multi-cylinder engine of his own design. This engine was built up from seven O.S. .60 four cycle

Dixon New's Cessna Skymaster taxis to take-off position.

Lockheed Constellation by Bruno Gottfried, Germany, flew beautifully with the 3 bladed props.



Five modified Nosen J-3 Cubs with Quadra power. Two belong to Bob Jones. Charlie Richards and his two sons own the other three. One son is 13 years old, the other is 17.

engines geared together (at 2:1) to turn a 24/16 Punctilio prop! Now all you have to do is think about it for a minute and you'll appreciate how that Pup performed on that prop. It flew very well, even in the wind (and at 1/3 Scale, it is huge) with the sound of the engine all but unheard in the air over the beat of the prop. The Pup itself was built using the Balsa USA kit as a basis from which to start. The kit was much modified in order to produce the model flown. Detailing was well-done and the model, due to its size and the unique engine, attracted a good deal of attention.

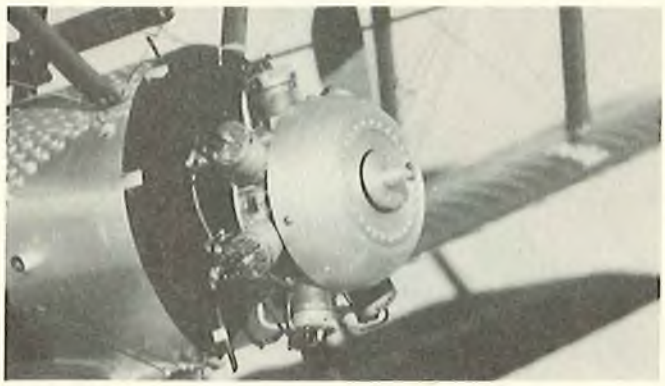
Subsequent to having a look at it myself, I had the opportunity to talk with Joerg, and he is an interesting chap. He lives not far from Toni Clarke of Practical Scale and showed me some photos of other models being built, including a Komet, a FW 190 and some others.

France was represented this year with an outstanding model of the Feisler Storch, built by Christian Taschet. The model is a fine looking example of the modelers art and even includes a pair of large lamps mounted under each wing. These are so bright that they are easily seen in broad daylight from the ground. The crowd reaction was immediate and audible whenever this model was flown toward them and the lights were turned on. A most impressive option and one which would be relatively easy to rig up. How they got them so bright is now known to me.

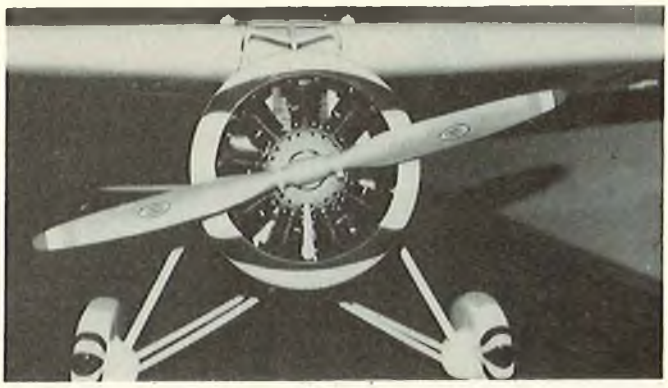
The model has an aluminum tube fuselage as in the original and is in French markings which Christian assured me was authentic. Apparently France obtained several of these aircraft following WW II and they were naturally given French markings. The Storch tips the scales at 33 pounds which was a bit much for the Twin Tartan engine of 2.5 c.i. displacement and Christian made arrangements at Las Vegas to take a Kawasaki back with him.

Speaking of the Kawasaki, I, too, was much impressed with its performance this year and have arranged to obtain one for my own use. If you ever plan to build an AT-6, then don't even consider any other engine than the Kawasaki.

The boys from Germany provided another multi-engined bird to dazzle the

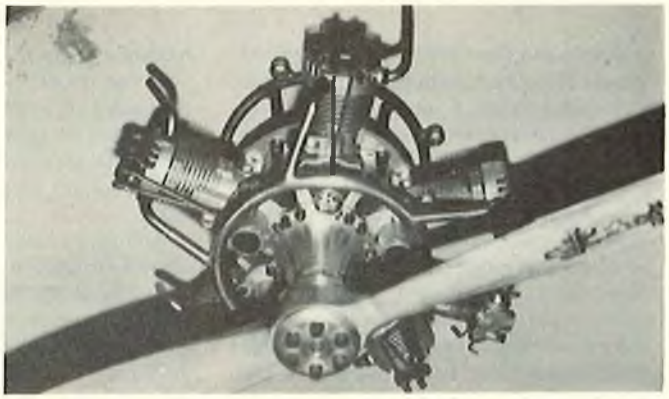


Joerg Vogelsang built the engine for his Sopwith Pup from seven O.S. .60 four stroke engines.

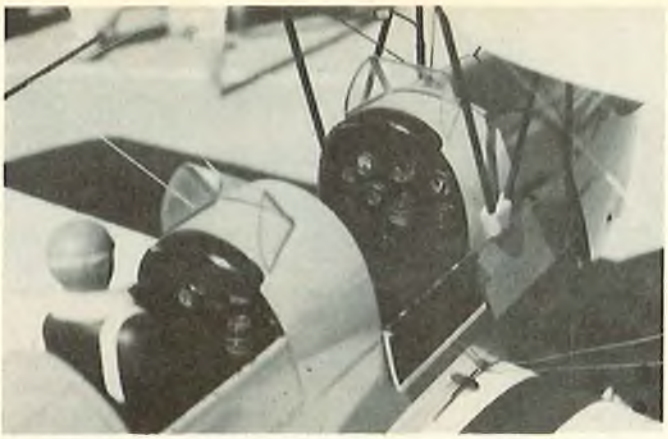


In addition to the details shown here, Dick Enos completely detailed the interior of his Winnie Mae Lockheed Vega.

John Bashore duplicated the details of the Art Scholl Super Chipmunk.



Good Aero engines were demonstrated. The radial engine is made from five O.S. .60 four stroke engines.



John Pahlow went all out with the detailing in his Tiger Moth.

The Fairchild F-27 Friendship by Bob Gillespie was most impressive in the air.

John Pahlow's immaculate Tiger Moth was built from a Toni Clarke Practical Scale kit. Quadra power, 27 lbs., Permagloss covering.

Chuck Fuller's PT-17 taxiing out for take-off.

Rearwin Speedster from a Bridi kit by Paul Castle. Very realistic finish.

The 1/3 Scale Sopwith Pup by Joerg Vogelsang performed beautifully and could barely be heard in flight.

spectators and fliers alike. Bruno Gottfried brought along his Constellation which tore up the sky a bunch. It was very fast with its four .60s and most impressive. There aren't many sounds in aeromodeling as hair raising as the beat of multi-engines in flight.

Looking back over previous years at Las Vegas, I'm always amazed at the progress being made by modelers. In the early years, there was a good deal of Quarter Scale activity, but not much experience. The years have seen a vast improvement in the detailing and the workmanship of the models coming to the QSAA Rally. It is very encouraging, especially to me to see the quality of workmanship and the expert care which has been lavished on the models making an appearance these days. It is rare now to see any rough construction or finish work.

Among the models showing real care and attention to detail was a J-3 Cub. Before you say, "What the heck can you do with a Cub?" be aware this one is 1/3 Scale and was done by Bob Nelitz of Ontario, Canada. Bob's work is well-known, what with his win of the Scale Internats at Borlange, Sweden, a few years back.

It makes me wonder a bit to see a relative newcomer to scale (which Bob is not, obviously) start with a complicated subject requiring a great deal of detailing when it would make more sense to start with a simple subject and do it well. Bob has typified this attitude in taking the relatively simple J-3 and then doing a superlative job on finishing and detailing it. Photographs of the model defy identification as a model.

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Chuck Fuller's Stearman PT-17.

Don Martin brings Bill O'Belmita's B-17 in for a smooth landing. B-17 has retracts.

John Greenfield's 1912 Blackburn on a fly-by.

The prop has scale bolts, trade-marked propeller and safety wired bolts. Each a relatively minor addition, but adding to the very complete whole. The engine is a masterpiece in miniature, right down to the scale screw clamps on the hoses, miniature spark plugs and perfectly scaled cooling fins. Yes, it looks like any old Cub until you start looking at the details and then the effect becomes overwhelming. The model weighs 30 pounds, flies very realistically on a Quadra, and the plan is available from Bob Nelitz. A number of innovative ideas are incorporated into the structure and if you are in the market for a fine looking, great flying scale bird, Bob's J-3 is a good place to start.

Another modeler of note was John Pahlow from California who brought along his stunning Tiger Moth from the Practical Scale kit. The kit is very complete and turns into a really good looking model in the right hands. John spent five months creating his Moth, covered it with Permagloss Coverite and finished with Formula U. The Moth tips the scales at 27 pounds and flies well on the Quadra engine installed. John is also involved with the crew who built and fly the Spirit of St. Louis which has set the pace this past couple of years in the Marathon event at Las Vegas and currently holds the distance record at the Rally of 208 miles. The Spirit was not flown this year in order to provide some incentive for others to compete in the distance event.

One of the prettiest birds present was a Bridi Rearwin from the kit finished in maroon and built by Paul Castle of Santa Maria, California. The tapes and rib stitching on the wings added a great deal to what is ordinarily a rather plain model. Covering was Super Coverite and power was by Quadra. Paul does nice work and I was not able to detect a single flaw in the Rearwin. On a Quadra, the Rearwin flies extremely well and is a good deal more agile than its full sized cousin.

I met Bob Gillespe, out of Idaho, at Las Vegas in 1980. This year he brought a Fokker Friendship, done in Hughes Airwest colors and Bob had the right idea for an attention getter. The very attractive Mrs. Gillespe was present in a replica of the Stewardess uniform worn by attendants aboard Hughes Airwest flights. Neat idea and nice lady.

The model was very well-done and, in static display, included ground and air crew figures loading and checking the airplane. A very effective treatment, and well-done. While some modelers may claim they are not 'doll makers' the effect of a figure in the cockpit or cabin and a couple around the aircraft on the ground make for an effect that is hard to beat and looks 'right' in the air. It is disappointing to see a good looking scale model wandering around in the air with no visible pilot on board, and 'doll maker' or not, the effect is worth the trouble. Bob took Best Finish award with the Fokker and flew it well.

Another exciting twin with a difference was a Cessna Skymaster (or Mixmaster, if you prefer) built by Dixon New. This model is quite large and uses two Quadras for power. The first flight at Las Vegas was a bit of a bummer in that the model hit a hole in the unpaved area off the edge of the runway and tore the firewall loose and bent up the nose gear. The builder and his crew worked through the night and had repairs made for the following day, flying the machine to the delight of the crowd. The Skymaster is quite fast and was landed once with only the aft engine running. With both engines on the centerline, no asymmetrical thrust is developed and with both running, the torque of each is cancelled by the other. Nice arrangement and good in the air.

Chuck Fuller of Seaside, California, presented a couple of models which were flown repeatedly in the strong winds experienced. Both were flown with outstanding skill and plenty of showmanship. The models are both Stearman biplanes and both are powered by Kawasaki engines. They really tear up the sky and the sound of the Kawasaki, although not a radial engine, certainly adds to the effect of seeing them in the air.

Chuck has had considerable stick time on the bipes and he turned them every which way but loose. They both look good in the air, but my favorite of the two of them was the PT-17 version which is a colorful addition to any scale meet. The second of the models was also a Stearman, but an air show version, complete with wing walker and a highly decorative color scheme. Both of these models garnered trophies at Las Vegas and both deserved them.

Just a word on trophies, they are awarded by the vote of the fliers present. The judging is done by all those who fly there and that

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Proctor Nieuport 28 by Dave Johnson, powered by O.S. Gemini twin.

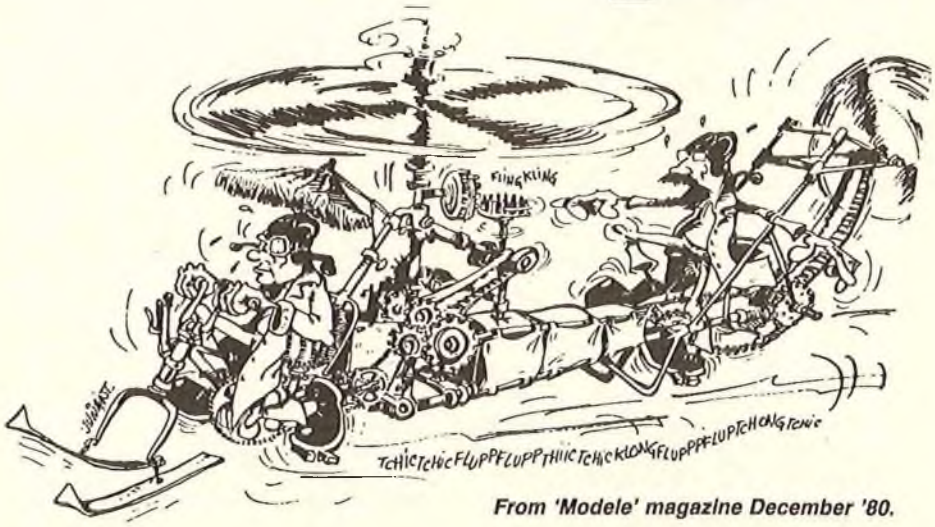
Functional hatch provides access to starting facilities on Dave Johnson's Nieuport 28.

GIVE IT A WHIRL

John Gorham

I certainly hope you all had a very happy and rewarding Christmas and by now you are busily building or perhaps even test flying that helicopter that Santa brought.

I've always had a yearning to build and fly my own small airplane (real one, I mean). When I saw the sketch below from the December 1980 issue of the French "Modelle" magazine, it gave me an idea of what I will probably finish up with! Ah, well, someday, maybe.



From 'Modele' magazine December '80.

One of the first items this month is to share with you a very whimsical but, I feel, informative letter from Ron Kings of Beltsville, Maryland. The relevant extracts of his letter are given below, in quotes, and I hope that you will enjoy it as much as I did.

"I have been interested in R/C helicopters since 1971 when I saw the Kavan team at Doylestown, Pennsylvania. Today, ten years later, their demo flight still remains vivid in my memory. But, like other R/C pilots, I resisted the temptation to actually try a helicopter. The reasons were many: cost, complexity, peer pressure, **fear,** etc. However, after watching a helicopter demo this summer, I finally decided to take the plunge."

Well, Ron bought himself a helicopter, built it and started to learn to fly. He had all the usual problems that the beginner has and found that it was more difficult than he first thought.

"Do you realize just how bad it is to go from 'expert' flier and club instructor to total 'idiot?' Man, it sure hurts the old ego! I felt like crawling into a cave. During the months of August and September I didn't socialize at the flying field much. There was a time when R/C was no longer fun. Fortunately I had a couple of die-hard friends who had been there before. They would shrug off my verbal abuse and just patiently keep helping me. Well, does this soap opera end happily? My hovering time had increased from 0 to 30 seconds during the past two months but I couldn't quite keep the chopper under control. One evening, October 4, I appeared at the field with my machine. Please realize that I had sold off **all** of my airplanes in that first giddy week of constructing my helicopter. Call it stupidity or call it dedication but the only thing I could take to the field was that dumb helicopter. Low and behold it flew! I was so happy. I fueled her up again and again and hovered out a second tank. Wow! It had been a long twelve weeks but I am a pilot again. I have learned many lessons during this time and others might find them interesting or 'funny.'

"(1) Once the helicopter is trimmed for flight it doesn't really fly any better. It's your **concentration level** that improves. Hovering requires intense concentration and can be quite tiring. It's only natural that this will take time to develop.

"(2) I constantly read and studied your basic flying columns of September and October, 1980, RCM, and they are still right on target, especially your analogy about the balloon. But nobody can learn to fly by just reading. You have to keep trying.

"(3) It does help to have friends. They were invaluable in the initial trim flights. They did learn to stay far away while I was actually trying to hover, but immediately moved to help when I was discouraged.

"(4) Many of the 'myths' about helicopters are not true. Especially the one that goes: 'for every six minutes of flight it takes six hours of maintenance.' Baloney! My workshop has never been cleaner. There is no constant balsa 'dust fog' in the air. Actually I have to look for things to fix. It takes about 15 minutes to clean up and post check the machine after I come home and that's it. I could completely tear it apart and rebuild it in four hours. So what am I doing downstairs? Shoot, it's no fun to go down there, sit at a clean workbench and turn on the TV. I'm going to build another helicopter. The wife and I actually go out to dinner once a week!

"(5) Don't give up. No matter how bad it looks at first, and no matter how loud your friends laugh, these things do fly. And there is no other R/C flying machine that will draw a crowd like a helicopter.

"Sorry about the length of the letter, John. These are just a few of the things that I've learned and I hope they will give some help to others. RCM is widely read and helicopter fliers need a voice in it. Please keep up the good work."

Well, that's a letter, as Ron says, which is both funny and informative. He tells it like it really is. There is no short cut for any form of model flying and helicopter flying certainly needs a lot of concentration and a lot of effort but it can be done and it can be done fairly quickly, provided you have the ability to concentrate and not give up.

So now let's see if we can provide some more information this month that will help to fill in the gaps of knowledge which might be the very reason for some of you giving up the effort.

Rather than cover any specific topic, I thought it might be helpful to some of the beginners in R/C helicopter flying if I gave a list of some of the hints and tips which have gathered in my mind over the past 10 years of R/C helicopter flying. Many of them seem obvious to me and, I'm sure to many expert fliers, but it could just be that some of them will help to solve some of the problems that you may be having in your efforts to learn. So here's a few

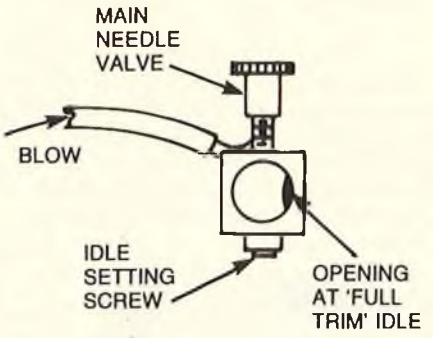
hints and tips as they came to mind.

Main Needle Valve Setting

Don't forget to run your helicopter engine on the rich side. That is to say, the needle valve should not be closed, as it is with an airplane, to the point where the engine is running smoothly and powerfully in a two cycle mode. The setting should tend towards "bubbly rich" so that, when the helicopter lifts off the ground, the engine is "crackling" from rich to lean. Only when you get into fast forward flight or aerobatics should the engine really run in a consistently smooth two cycle. If, during hovering, you find your engine is starting to two cycle consistently and seems to be running faster and faster, then land, stop the main rotor blades, and open up the needle valve a few clicks. Many helicopter engines are ruined through running the engine too lean. So don't forget to run an R/C model helicopter engine rich, rich, rich.

Proper Idle Setting

There is often confusion in setting the engine controls for the proper relationship between the main needle and the idle settings. Here's a tip which I have used for many years now to get an approximate setting on idle, at least. The top end should be set as described above. Connect a piece of fuel tubing (preferably without fuel in it!) to the carburetor fuel inlet nipple. Switch on your receiver and transmitter and set the transmitter throttle control so that the throttle barrel inside the carburetor throat shows a maximum air hole width of about 1/16".



That means there will be a gap inside that looks like a new moon, with the fattest portion about 1/16" wide. The main throttle lever will be at its lowest setting and the trim lever at maximum. Now set you main needle valve to the setting the engine manufacturer recommends — usually between 1¼ and 4 turns (it is not critical at this point), and blow through the tubing. You should hear a very gentle hiss of air coming out of the carburetor air intake hole. If you hear nothing, then open the idle setting until you hear the air. Once air is flowing, close the idle screw until the air flow just stops. Now open up about 1/2 turn and this will be a good initial setting for your idle adjustment. Don't forget that a good setting will not only be so that the engine idles smoothly, but also such that when the throttle is opened reasonably fast the engine will pick up promptly and reliably. It should not gurgle and die, nor should it pick up into immediate two cycle operation. A very slight hesitation and then a smooth pick-up will show that the idle setting is approximately correct. Then, leave idle alone and concentrate on setting the 'top end.' Finally, very small adjustments on each will provide the all around and reliable engine performance which the 'chopper' must have.

Lubrication

Always make sure that your helicopter's moving parts are well oiled, or greased, as the case may be. The exception is the plastic drive gears when they engage with steel gears or pinions; these should be run dry. But where there is a metal to metal rotating or moving contact, such as in the rotor head of the helicopter or in the tail controls, then plenty of thin oil (or grease) should be used. It's a well-known habit with expert fliers to be sure that their helicopters are well-lubricated (and, of course, kept clean too). So don't forget to do this and it will result in a smoother control system, less worn out parts and maybe less crashes.

Mechanical Security

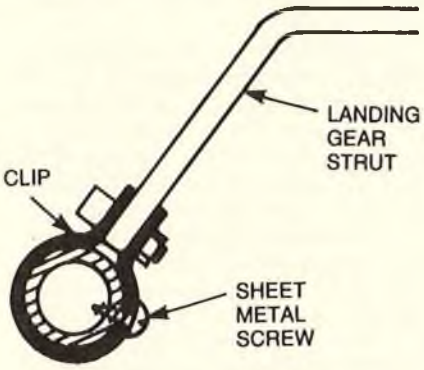
Always check that nuts and bolts on your helicopter are not loose, especially after the first flight or two following the initial construction of the helicopter. But, in any event, a check for mechanical security of all parts should be a habit after the helicopter is cleaned off following your flying sessions. Just run over it and make sure that nothing has become loose or fallen off. In this respect, be sure that all of the non-lock nuts are secured with 'Loctite' (the blue variety — not the red).

Check Controls

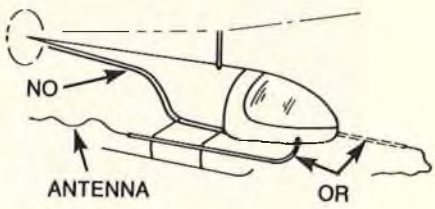
Be sure that all the control rods from the servos to the control surfaces are free for the full extent of their movement and also have a very low friction level. A simple check for this is to disconnect at the servo arm and move the control rod with your fingers. It must move the full range and be easy to move. Don't fly if it doesn't — find out why. Sometimes you may make adjustments in the field when flying and, in so doing, you will cause a "bottoming out" of one of the controls in one direction. Then the poor servo will stall out every time the control is moved to full control in that direction. This can then result in not enough control in one direction and you may not find this out until you really need it.

Radio Noise

Always check the helicopter for loose or rattling parts which could cause radio noise. One of the consistent problems with nearly all model helicopters is that the landing skids become loose in the clips which hold them to the cross struts. Some people fit some plastic tape around the skids to make the clips fit tighter and this is not a bad idea. But probably the best of all is to drill a small hole through the metal retaining clips, into the skids (all for positions), and fit a small sheet metal screw into that position, making sure you have some silicone rubber on it before you drive it in. By the way, silicone rubber is an extremely good medium to use on model helicopters to avoid metal parts coming loose through vibration. I always use this between the muffler and the engine and on any screws in the helicopter which are fitted into blind holes. Blue Loctite is still the best for plain old nuts and bolts though.



Always route the antenna out from the cabin as close as possible to the receiver and run it in a nylon tube for at least half its length. The tube can be tied to the outside edge of the landing gear cross struts as it runs back or it can even hang loose. Some of today's expert fliers run the radio antenna straight out from the front of the cab, pointing forward, and this takes it well-away from potential interference from the helicopter. Looks funny but it works.



C.G. Position

The position of the C.G. of the model

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PIT STOP

Gene Husting

4th Annual S. California 1/12 Regionals

The 4th Annual So. California Regional Race for 1/12 Scale electric cars, was held in Sylmar, California, a few miles North of Los Angeles. The Regionals races in the past have always been the largest 1/12 race in the country, even surpassing the ROAR Nationals in the 6 cell Stock & Modified classes. This year, the 200 entries were not quite as large as a couple of the So. California Series races, which had 240 entries. I believe this was due to the excessively high entry fee of $25.00, which made it difficult for many people and almost impossible for families that race. Because of this, the race on the same weekend at Briggs Cunningham track, attracted 40 entries with only a $4.00 entry fee.

The Sylmar track is exceptionally good. It's located behind a small shopping mall, next to a slot racing shop where R/C car parts are available. The parking lot had been resealed, however, the actual racing surface was not resealed, because the original surface had good traction, and the resealed surface was slippery. At first look, it appeared the track surface was painted a light grey color over the black asphalt. But this was only the difference in color between the original asphalt and the resealed surface. This made the track layout stand out, and made learning the track much easier and quicker than normal.

This Annual Regionals race is always one of the biggest in the country, but this year it had an added importance because it would be one of the 4 races used to qualify drivers for the 1/12 World's Championships to be held in So. California in August, 1982. The 4 qualifying races are, the 1981 USA ROAR Nationals, the So. California Regionals, a Columbus, Ohio indoor race and the 1982 Florida 1/12 Winternationals race in Orlando, Florida. All of the "A" Main drivers at these races, in the Expert class only, will qualify for the World's Championships, up to a maximum of 40 drivers. There will also be 40 European drivers entered, as well as 40 Asian drivers. The World's Championships will be on an outdoor asphalt track, using 6 cell cars, in Stock and Modified classes.

We arrived Friday afternoon for practice, and it wasn't long before I was out practicing on the track. It seemed everyone was going faster than I was, but it was my first time on the track and I was still trying to learn where the correct braking points for the corners were. However, somebody went by me much faster and easier than anyone else — it was Frank Killam. Frank has been racing 1/12 cars for 9 years now. He started with the 1/12 Jerobee gas cars, then switched to the Leisure electric cars about 6 years ago. Frank races every weekend and has as much experience as anyone and he only lives 15 minutes away from this, his "home" track, so he certainly should know the fast way around. So I figured the smart thing for me to do was to follow Frank around, until I learned the track. Of course, this is always much easier said than done, but it seemed like a great idea at the time. By the end of the day, everyone had pretty well learned the track and everyone was going fast.

Saturday was Stock class, with Registration and Tech Inspection from 7 a.m. to 8 a.m. The stock motors were supplied by Neal McCurdy, the Race Director. It was announced at least 3 times that Registration and Tech Inspection would close at 8 a.m. At 8 a.m. it closed without Mike Lavacot, Kent Clausen, Butch Berney and Randy Tentschert signed up! They were still at their hotel room! Apparently they figured they didn't need the practice session, so they could come later. When they arrived at 8:45, they were informed they were too late to race. I know Randy was sick about this, because he had made the 2 hour drive to the track to practice, every other day for 2 weeks before the race. He was doing his best to qualify for the World's Championships. It was a shame.

There was one practice round, then 2 qualifying rounds and then the Main events. With all the pressure on the Experts to qualify, it was Bruce Hickman, who was the fastest with Top Qualifying honors, with his box stock RC12E.

Novice Stock Class

Top Qualifier, Jim Brent, also had plans on winning the "A" Main, and he did just that, but it wasn't easy as Julie Husting made it a race right to the finish line, finishing just a couple of feet behind Jim, with Max Bowers following in 3rd.

The 4th Annual Southern California Regionals was held in Sylmar, California, on this super smooth, high traction track, with 200 entries.

Walt Bailey, on the right, came all the way from England to enjoy our racing, as well as learn some "speed secrets" from Roger Curtis.

Mr. Jomac, Don McKay, came down from Washington, he said, just to race Mike Reedy. Well, it ended in a draw. Don beat Mike on Saturday, but on Sunday, Mike beat Don.

The fastest driver in the Stock Class was Bruce Hickman. Bruce was Top Qualifier with his box stock Associated RC12E with a McRae body.

The Stock Class winner belonged to local favorite, Rich Douglas. Rich used a TOJ body on his box stock RC12E.

Gene Husting's prototype "Wonder" car used by five drivers to make the Modified "A" Main. Front and rear wheels bounce up and down while the center section with batteries and radio, remain smooth. This is done without metal springs. Friction shock absorbing devices help keep the wheels on the ground for better handling. The car should be available about the time you read this. Car features Reedy horsepower, Futaba receiver, Novak servos and new Kimbrough servo saver, Sanyo batteries.

Curtis Husting raced the new Lola T600, which appeared to be exceptionally fast on the straightaways. He also got 3rd place in Concours with this dual entry of his 1/12 and 1/18 Scale cars.

For the man who has everything. If you like R/C cars, you build you own R/C car track in your backyard. This is what Chris Chan did. Chris is standing on the right, with Walt Bailey and Roger Curtis driving from the driver's stand.

Novice Stock "A" Main
1. Jim Brent — TQ
2. Julie Husting
3. Max Bowers
4. Chip Hayes
5. Anthony Porter
6. Bob Dewald
7. Chuck Baker
8. John Green
9. Bob Kellum
10. Steve Toland

Amateur Stock Class

Sonny Maddison was the fastest qualifier, but in the "A" Main, Gary McAllister was the fastest winning in a very close finish with Bobby Schatz finishing 2nd and Bob Hayes 3rd.

Amateur Stock "A" Main
1. Gary McAllister
2. Bob Schatz
3. Bob Hayes
4. Sonny Maddison — TQ
5. Mike Buffington
6. Mike Pallotto
7. Chris Chan
8. Russ Aguirre
9. Terry Ballard
10. Robert Fujioka

Expert Stock Class

The Expert qualifying was extremely close with the 11th, 12th (me) and 13th place qualifiers missing the "A" Main by one second. In an 8 minute race, this is about 2 feet. In the "B" Main, Mike Wibben got a super start and was long gone. I got banged around at the start and eventually worked my way up to 2nd as the race ended, but Frank Killam wasn't more than 3 feet behind in 3rd.

Expert Stock "B" Main
1. Mike Wibben

Mike Toland was very impressive in his first big race. Mike qualified 2nd in Modified and finished 3rd.

Mr. Top Qualifier, Mike Lavacot, did it again and also took 2nd place in the Main, in a very close finish.

2. Gene Husting
3. Frank Killam
4. Robert Cavazos
5. Mike Kimrey
6. Steve Hickman
7. Joel Mayer
8. Mike Toland
9. Rich Lee
10. Mike Hickman

By the time the Expert "A" Main started, it was starting to get dark. There were parking lot lights that were just adequate to race by. Tim Neja took off in the lead with Jim Aguirre close behind. Rich Douglas was in 3rd, and after about 6 laps he passed Aguirre and took out after Neja. A few laps later he caught and passed Neja to take over the lead. The Top Qualifier Bruce Hickman was now also moving up fast and had taken over 2nd. Rich Douglas was probably thankful he had an all white body for this Main, as it was now racing under the lights, but Rich did a super job, even while being pressured by Bruce Hickman in 2nd and Doug Kott in 3rd. Rich went on to win his biggest race ever, with Bruce 2nd and Doug 3rd.

Expert Stock "A" Main

1. Rich Douglas — Associated
2. Bruce Hickman — TQ — Associated
3. Doug Kott — MRP
4. Curtis Husting — Associated
5. Tim Neja — Associated
6. Jerry Case — Associated
7. Jim Aguirre — Associated
8. Bob Arwine — Jomac
9. Ken Stephenson — Associated
10. Roger Curtis — Associated

Sunday — Modified Class

Guess who were among the first drivers at the rack on Sunday? You guess it — Lavacot, Clausen, Berney and Tentschert. And was Lavacot serious? His 40 lap Top Qualifying run was beautiful, as always. Does that answer your question? But 2nd place in qualifying went to a fairly new name among the Experts. Mike Toland, driving Mike Reedy's prototype new Associated suspension car, nicknamed the "Wonder" car, also turned 40 laps! I must have been trying harder than I thought, because I was in 3rd place, just missing 40 laps by one second. Rich Lee, Roger Curtis, and Mike Wibben also put their "Wonder" cars in the "A" main. I can't tell you we were such great drivers, because the cars were doing all the work. The "Wonder" car was basically designed to work well on bumpy and/or slippery tracks, and so it was quite a pleasant surprise to see it also work on a smooth high traction track, too.

Novice Modified Class

Jim Brent was again Top Qualifier, but in the "A" Main it was Anthony Porter taking the checkered flag with Don Sallenbach in 2nd followed by Julie Husting in 3rd. Julie was consistently fast with a 2nd in Stock and a 3rd in Modified.

Novice Modified "A" Main

1. Anthony Porter
2. Don Sallenbach
3. Julie Husting
4. Mike Kierce
5. Bob Kellum
6. Chip Hayes
7. Dick Pritchett
8. Chuck Baker
9. Jim Brent — TQ
10. Max Bowers

Amateur Modified Class

They may be called Amateurs, but they're awfully fast, as a matter of fact a number of Amateurs were moved to Expert class after this race. But today belonged to Mike Westfall. Mike was Top Qualifier and he liked that so much, Mike also went on to win the

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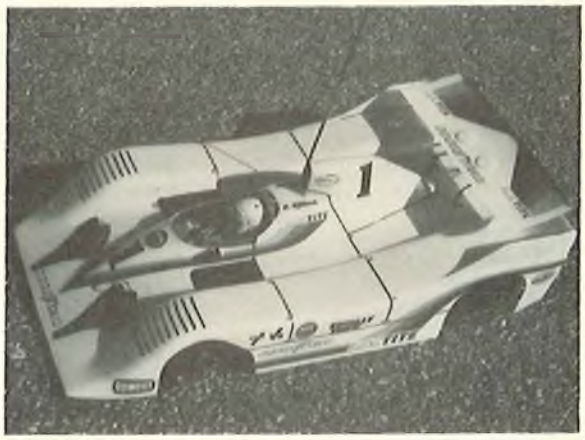
Frank Killam, Team Leisure Captain, wins the big one from wire to wire.



Concours honors was also won by Frank Killam with this beautiful VDS body.

AMA R/C FREQUENCY COMMITTEE

Status Report — November 1981

By Bob Aberle

The following status report indicates some significant progress towards our goal of obtaining 50 new R/C channels for model aircraft purposes and 23 new R/C channels for non-aircraft use (primary R/C cars and boats). What we have learned from the FCC this past week leads us to believe that all the new channels requested may become effective during the latter part of 1982. It is suggested that you read the attached report carefully.

As a result of certain actions that took place during the week of November 2, 1981, we have been given reason to believe that the FCC will release its long awaited "Notice of Proposed Rulemaking" (NPRM) in February 1982. It seems likely that our new 50 aircraft and 23 non-aircraft channels will go into effect by the end of summer (1982).

Most R/C modelers are well aware of the fact that, under the present FCC rules, they must share their frequencies with industrial and commercial radio stations. Unfortunately, this sharing has been one of an "unbalanced" nature. R/C modelers operate handheld transmitters with a maximum power output of 3/4 watt, while the commercial stations are permitted to use much higher power levels along with antennas of substantial height. This "unbalanced" sharing has become even more critical because of the marked increase in the number of newly licensed industrial and commercial radio stations. Because of these growing problems the R/C modeler urgently needs new frequencies.

Progress towards obtaining these new frequencies has been painfully slow. Recent (major) budget cuts will cause some severe staff reductions at the FCC. We expected these reductions would make progress towards new frequencies all the more difficult. Therefore, the committee decided recently to initiate an "FCC/RC Awareness Program." The program was to consist of three phases. Phase one was a letter (already delivered) to the FCC Chairman and Commissioners, requesting a personal meeting so that we could explore the possibilities of obtaining temporary use of some of the new channels (on a rule waiver basis). Phase two involves a presentation to the Commissioners. Phase three was to be a "full blown" letter writing campaign, on the part of the membership, to the FCC and interested members of the Congress and Senate to support our position.

That was our plan of attack until November 6, 1981. On that day, Dr. Walter Good and AMA's Attorney, Jack R. Smith, met with Dr. Stephen J. Lukasik, FCC's Chief Scientist and Mr. Donald D. Campbell of the FCC's Office of Science and Technology. In somewhat of a surprise disclosure it was learned that the FCC was proceeding with the final draft of the new NPRM and, according to Dr. Lukasik, they had every reason to believe it would be released some time in February 1982. When informed of our planned "FCC/RC Awareness Program," Dr. Lukasik suggested that we: (1) hold up on our request for the interim R/C channels because it would delay the issuance of the NPRM (covering the new 50 plus 23 channels); (2) continue plans to make a formal presentation to the FCC commissioners which will explain our urgent need for these new channels (this will benefit us when our proposal comes up before them for the final vote), and (3) hold off on our proposed letter writing campaign. A large flow of letters at the present time would greatly slow down the rulemaking process. Dr. Lukasik was candid enough to indicate that if the NPRM is not released as planned (in February 1982) we have every right to send in our letters (presumably of complaints).

One of the most important aspects of the procedure leading to rule adoption will be the nature of our response to the NPRM. The AMA expects to respond with a professionally prepared statement supporting the proposal. The public is also free to respond to the FCC concerning the NPRM. Should a considerable number of "controversial" responses be received by the FCC, it would likely further delay our efforts towards obtaining new frequencies. If you have trouble understanding the NPRM, or the AMA proposal, please give us (Frequency Committee) a chance to answer your questions before you attempt to write the FCC. We have all worked very hard for this moment, let's not foul it up now!

Additional Items of Information

(1) The actual FCC presentation (or series of presentations) was made by a committee member, Mr. Fred Marks, and by AMA's Attorney Jack Smith during the period November 30 to December 11, 1981. Copies of the formal presentation will be distributed, via the charter club mailing list, for the information of the membership.

(2) A general Frequency Committee meeting will be held in Washington, one week after the release of the NPRM (February 1982). It will be a Friday/Saturday two day session. The first day of the meeting will be open to the public. Industry representatives, model press and special interest groups (R/C cars and boats) will be invited to attend for the purpose of commenting on the NPRM. The second day of the meeting the committee will draft the official AMA response to the NPRM.

(3) In the ensuing period the committee will be doing a lot of "homework." The long awaited Frequency Flag Control System will be finalized so that it will cover all existing and new R/C channels. Committee member, Jack Albrecht, has been charged with the responsibility of providing a detailed "Phase-In Plan." This plan will explain when and how to start using the new channels, and how the old seven channels will be phased out. We are also obtaining "trial run" computer print outs of licensed industrial and commercial radio stations operating on the 72-73 MHz and 75 MHz bands. These reports will eventually form the basis for your personal selection of R/C channels, throughout the country.

(4) R/C manufacturers are

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R/C SAILPLANE DESIGN

Part III

By Ed Slobod

Thus far we have only demonstrated that if the structural geometry is the same, the wing will be stronger in bending --- less stress on the spars --- when the spars are located further apart, and that the thicker wing section that results from the wider spar spacing may not be detrimental to our design objectives. The analysis was performed, for simplicity, on the spar alone.

This is not the whole story, however, and an explanation of some of the significant changes that happen to a cantilever beam subjected to a bending load is in order at this time. Consider a beam made up of a number of very thin identical members stacked together and supported at the ends. See Figure 9.

FIGURE 9

If we apply a load between the supports sufficient to bend the stack, we get a picture like this. See Figure 10.

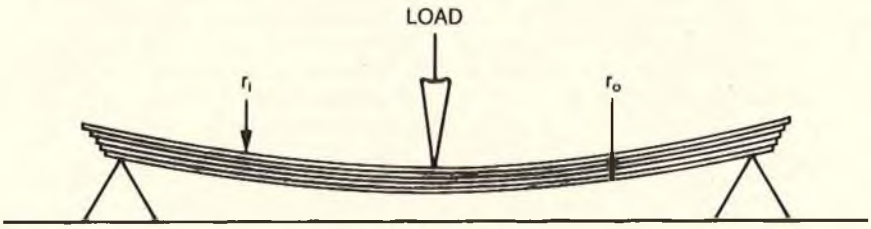

FIGURE 10

As you can see, the inner slab is bent with a radius of r_i and the outer slab having a larger radius, r_o, the slabs tend to slide with respect to each other. If the slabs were just tack glued together, the sliding action would surely shear the glue joints and allow the slabs to move as shown.

If we now inserted a solid member between the spar caps, see Figure 11, and firmly attach it, the amount of deflection of the beam under load would be materially reduced since the top and bottom members would be restrained by the inner member. For long slender beams, such as our wing spars, the bending stresses in the caps are much greater than the shear stresses in the web so it is feasible and desirable to reduce the amount of material in the web, and it's common practice to use 1/8" thick balsa webs with 3/8" x 1/8" spruce caps for at least 1/2 of a wing's semi span. See Figure 12.

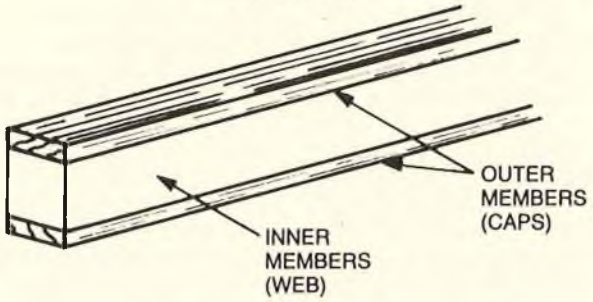

FIGURE 11

The outer 1/2 semi span can use a spar of identical geometry but with hard balsa caps or reduced size spruce caps. Note that the shear webs can be applied to the sides of the caps to make a box spar. See Figure 13.

The shear webs play another very important role that requires some understanding. When a wing is caused to deflect (bend) under load, the lower spar cap is loaded in tension (pull) and the upper cap in compression (push). While the amount of load applied to the spar caps is essentially the same, the tension load tends to straighten the lower cap and the load path is through the cap; but when a push load is applied to a long slender member, it will deflect away from the load path unless restrained. The shear webs prevent the deflection of the top cap. This is very important as most broken wings are the result of failure of the upper spar cap in compression.

If you took a piece of 1/4" sq. x 36" balsa and pulled on the ends, you would see that it would take a lot of force to break it. Now put one end on the floor and push the other end. As

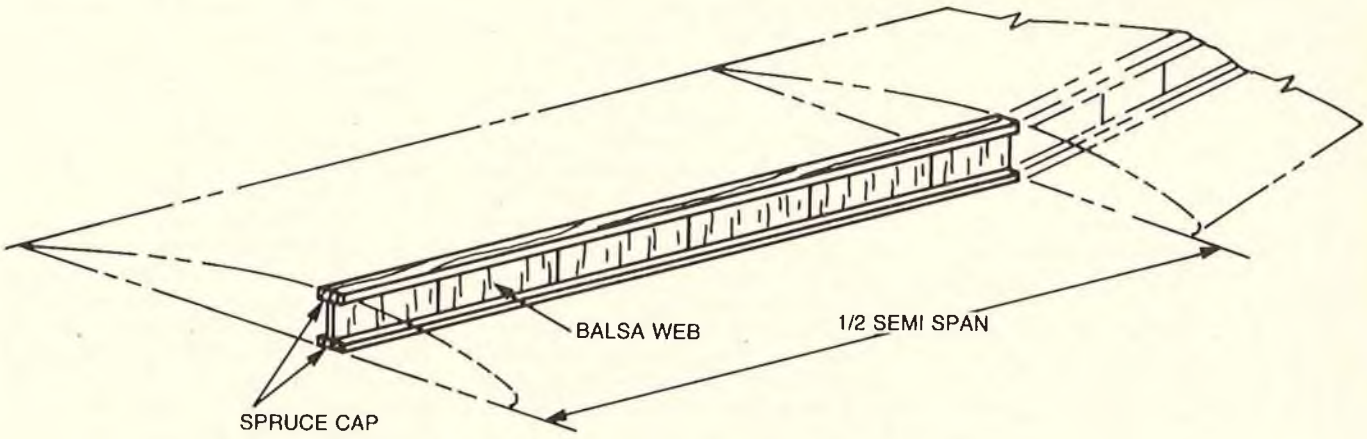

FIGURE 12

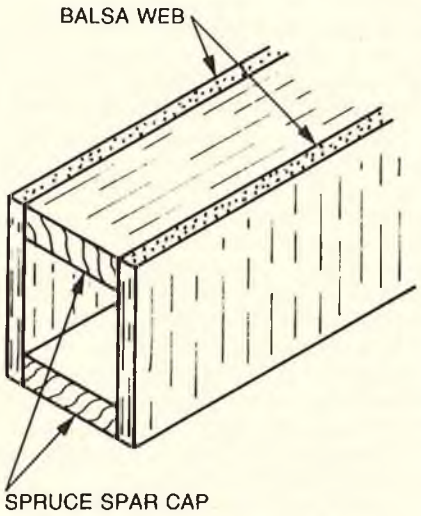

FIGURE 13

you can see, unless you are very careful to apply the push straight down, the 1/4" sq. will deflect at a very little load and further application of the same load will surely break it. In order for the top spar cap to do its job, it must be prevented from independent deflection. Regardless of the size of the members of a composite spar or the materials used, the full strength of the assembled structure cannot be realized unless the bonding that holds the pieces together, glue or epoxy, is thorough. Sorry to be so long-winded about this, but the most crucial part of a sailplane, both aerodynamically and structurally, is the wing; and the spar, or spars, are the primary structural components. More about structural design later.

At this time it might be wise to list the design requirements and see where we stand:

Now let us list the design decisions we have made and see how they check

Item	Desired Factors Influencing Item
1. Low Sinking Speed	a. light wing loading b. high lift wing section c. low drag
2. High L/D	a. low drag wing section b. low drag for total configuration c. high aspect ratio
3. Good Handling	a. proper vertical and horizontal stabilizer areas coupled with suitable moment arms b. proper decalage c. polyhedral wing d. proper wing dihedral and vertical stab area match e. proper mass (weight) distributions --- fore and aft and laterally f. relatively stable wing section
4. High Launch Capability	a. fairly thick wing with high C_L b. flaps c. strong enough for 12 volt wench
5. Ability to Land Safely with Precision	a. light wing loading b. high C_L c. glide path control --- flaps or spoilers d. good handling at low speed e. strong airplane
6. Hi Speed Capability with Precision	a. strong airplane especially wing b. low drag model and wing c. large enough ballast compartment for 15 oz./ft.^{2}
7. Sharp Turn Capability At High Speed	Same as above plus a. responsive controls b. ailerons
(A) Ease of FAB, etc.	a. straight forward uncomplicated design b. minimum of control functions c. use of conventional materials
(B) Convenient Break-Down for Transport and Shipping	a. removable wing and stab b. 2-piece wing or removable outer panels
(C) High Strength to Weight Ratio	a. proper choice of materials b. design for best use of materials c. good fabrication practices

with our design objectives.

Span = 100" — okay for good roll rate for fast turns.

Aspect Ratio = 12.15 or 13.125 — not high enough to have much effect on L/D but okay for reasonable performance.

Wing Loading (Design, Empty) = 7 oz./sq. ft. — light enough to satisfy item 1, 5, yet a realistic figure for a strong FAI ship if structural design is carefully done.

The next decision to make is a tough one. What wing section to use. My recent experience with Mike Bames' section would lead me to use it for the F3B ship as it satisfies the following: 1b, 2a, 3f, 4a, 4c, 5b, 6a, A_c, B_B, C_b continuing with design decisions, my personal choices would be as follows:

I would use a polyhedral wing instead of a "V" dihedral wing with ailerons as a matter of personal preference, opting for good handling and simplicity of construction and control functions at some sacrifice in high speed turning ability.

The wing would be similar to the one used on the Gemini, which was a four panel polyhedral wing with the main panels joined at the center and plug-in tip panels. The main panels would be constant chord, and the tip panels would be tapered. The section would be 15% thick with a 2.5% mean camber line. The main panel spars would be 3/8" x 1/8" spruce, top and bottom, with 1/8" balsa shear webs. The leading edge would be sheeted top and bottom with 1/16" balsa. The ribs would be 3/32" balsa with 1/16" x 1/4" cap strips. Since I have already built the wing, I know it to be very strong in bending and exceptionally stiff in torsion (twisting).

Thus far, nothing specific has been said about fuselage, and tail assembly design, either aerodynamic or structural, and since this article is not intended to be a design "cook-book" we will, once again, discuss them in very general terms.

The fuselage: The fuselage is a structural component whose function is to hold the other components in a proper relationship to each other and to provide an enclosure for the stuff that you don't want hanging out in the breeze. If you were designing a sport sailplane, you could use your doghouse or other strangely-shaped object to hold the components together and it would still fly --- after a fashion. For our F3B design, the fuselage should be as small in cross section as structural and gear fitting will permit. Contour changes should be gradual. Wing and tail mounting should be positive and repeatable. Internal gear and ballast areas should be accessible without surgery. If your radio is going to act up, it will do it at the contest. Don't let Murphy's Law get you. If you use a releasable towhook, it should be solidly mounted and **reliable**. The areas just forward of the tail group, aft of the wing, and forward of the wing are the most susceptible to failure, and in that order. Internal reinforcement should be used in these areas.

Tail moment arms (the distance between the wing trailing edge and the horizontal stabilizer leading edge) can vary from 1½ to 2½ wing chords. Models with short moment arms respond more quickly to pitch commands which is desirable but are also more readily disturbed around the pitch axis by wind and gusts which is not desirable. The long moment arm models, naturally, behave the opposite. Also, the further away the tail is from the C.G., the more difficult it becomes to balance the model at the desired C.G. without excessive dead weight in the nose. The fuselage length forward of the wing leading edge should be long enough to house the radio gear, usually 1 to 1¼ times the wing chord.

There is really nothing magic about the fuselage size and, in general, I would say "less is better." Do leave enough under the wing to hang on to for launching. Horizontal stabilizer design is relatively uncritical. It needs to be large enough --- anywhere between 10% to 20% of the wing area. For long moment arms, less stab area is required, and vice-versa. It is important that the stab be as light as possible and thick enough to resist bending and twisting stresses. Stab flutter is not a pretty thing. Flat horizontal stabs and elevators are okay for slow flying sailplanes but not for F3B sailplanes. Don't be afraid to use a streamlined stab with the maximum thickness of between 6% and 10% of the chord. Besides, you need the thickness to house the large pivot tube if the stab is full flying.

The vertical location of the horizontal stab has little or no effect on the performance of this machine. Fuselage-mounted stabs are most secure but are subject to damage from ground protrusions when landing. Fin-mounted stabs are fine but be sure to use at least a 3/16" diameter pivot tube. "T" tails are racy looking but are nasty to set up for clean, no slop, functioning. The ideal vertical stabilizer area for best handling is not easily determined. Vertical stabilizer area can be anywhere from 5% to 10% of the wing area, and best handling results from a good match between dihedral and vertical stab area. Low dihedral models require little vertical stab and high dihedral models more. If the amount you choose is too little, your model will tend to rock and wallow, especially in windy or gusty weather. Too much and the model will be slow in righting itself when banked to circle and often a turn will cause the nose to drop. Unless you get lucky on your first guess, the chances are that you will have to alter the amount of vertical stab area that you initially chose. It is also quite possible that your model will be something less than the "Dream Machine" that you had hoped for. Don't be discouraged if it turns out this way. It's normal. In fact, it would be most unusual if your design effort was not followed by a long **development** effort. Everyone goes through this, even industrial giants like General Motors; and even then they often don't get it right.

Okay, I'm almost done. Just a few more do's and don'ts and you can race out to your workshop and get started on your first "original design."

1. Keep it simple. That doesn't mean boxy or ugly. It means strive for straightforward design. Remember you have to build, maintain and repair it. Question every line that you draw. There should be a good reason, or reasons, for every design decision that you make. No part of your model should get a free ride. If it's there, it should be there for a reason.

2. Keep the extremities light. It's not easy, but you should strive for light wing tips (outer panels) and light tail group.

3. "Attention to detail" is important. The strength of a structure is seriously jeopardized if your glue joints are not carefully made.

4. If you don't own several different length metal straightedges, get some. Balsa and spruce even when cut straight cannot be relied on to be straight when you are ready to use them. Use a long metal straightedge to line up the bottom spar cap on the workbench. Plans are drawn or printed on paper and paper is affected by heat and humidity. Trust your straightedge, even if it means a slight deviation from the plans.

5. It is more important that the wing and stab halves match each other than if they precisely match the plans.

6. Be selective in choosing materials. Balsa can vary from punk soft to rock hard. If your local model shop won't let you go through his stock or if his supply is limited, find another

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RCM PRODUCT REVIEW

West Coast R/C THULIN TYPE 'K'

SPECIFICATIONS

Name	THULIN TYPE 'K'
Aircraft Type	1917 Monoplane
Manufactured By	Technitrade Skogsviksvagen 52 S-18235 Danderyd, Sweden
Imported By	West Coast R/C Dist. 4959 York Blvd. Los Angeles, California 90042
Mfg. Suggested Retail Price	$179.95
Available From	Both Mfg. and Retail
Wingspan	72 Inches
Wing Chord	14 Inches
Total Wing Area	908 Square Inches
Fuselage Length	44 Inches
Stabilizer Span	21½ Inches
Total Stab Area	108 Square Inches
Mfg. Rec. Engine Range	.40-.60
Recommended Fuel Tank Size	10 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt., Ailerons optional, Wing warping
Basic Materials Used In Construction:	
Fuselage	Balsa, Ply, & Spruce
Wing	Balsa & Spruce
Tail Surfaces	Balsa & Ply
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (4 pages)
Construction Photos	No

RCM PROTOTYPE

Radio Used	Futaba 4 channel
Engine Make & Displacement	HB 50
Tank Size Used	10 Oz. Sullivan
Weight, Ready to Fly	122 Oz.
Wing Loading	19.35 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Appearance, completeness of kit, wood quality, and scale construction.

WE DIDN'T LIKE THE:

Price of kit, no pre-fabrication of metal parts.

The Thulin Type "K" is a 1917 Swedish fighter plane. Dr. Enoch Thulin is considered the founder of the Swedish aero industry. One of his designs that emerged in 1917 was the Type "K". The Type "K" has an all flying rudder and elevator, lateral control is accomplished by means of wing-warping. In 1918, ailerons and horizontal stabilizer were added.

This 1.5 scale model follows the prototype closely with regard to construction and directional controls, based on factory drawings. All wires are functional and the rigging can be disconnected for ease of transporting to the flying field. This kit is not for the newcomer and the instructions only indicate deviations from normal building practices or possible difficulties.

The kit comes in a box 44" long, 8½" wide and 4" high, with a white and brown antique-looking label. When we opened the box, we found all the hardware and miscellaneous parts were packaged in plastic bags. Rudder and elevator parts were machine cut and bagged, wing ribs were beautifully die-cut. The wheel hubs were turned from hardwood and the tires are a hard foam rubber — all packaged separately inside the large aluminum cowling. 1/4" aluminum tubing was supplied for the wingtips, and all the brass tubing and brass plates are supplied for the tailskid and wing-warping pulley assemblies. Threaded wire, eye bolts, nuts, and clevises are supplied for assembly of 22 turnbuckles. Plastic coated 20 lb. test cable is

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Insurance Coverage and the R/C Hobby

By Dr. Saul W. Adelman

Because of the expense involved in participating in the modeling hobby, insurance is becoming more important. Expense includes not only the cost of purchasing kits and accessories, but also the financial consequences due to the destruction of your property and your negligence that injures other people as well as their property.

This article will address insurance contracts and the various situations that may occur with respect to problems modelers face. Several previous articles have talked about the problem but not in specific terms.

The general problem of deciding whether or not insurance coverage exists stems from the insurance industry's traditional method of dividing contracts to cover certain types of property (e.g., homes, boats, aircraft, automobiles). Because of this division strategy, there is some question as to whether models conform to the insurance company's definition of what is excluded or covered.

The insurance contracts can be modified to define the words "aircraft," "watercraft," and "automobiles," in such a way that modelers could obtain coverage for their property as well as for their negligent acts. There is no reason that an insurance company, at the inception of a contract, could not define these words. When modelers purchase insurance contracts, they are sharing in the expense of other hobbies (insurance is a pooling process). There is no reason why others should not participate concurrently in the modeling hobby.

When the definitions are changed, instead of the losses spread over the relative small number of AMA participants, the losses will be shared by the large number of homeowners. The increase costs of the HO contracts will be hardly noticed; and, price pressures will be relieved on the AMA insurance since it will be truly excess coverage. An additional benefit would be that now the modeler has more protection against liability.

The contract discussed is the most widely used homeowners contract (HO-2 ISO form Ed. 7-77). Other contracts vary slightly from the HO-2, but for our purposes, the intent is similar. Also, at first, the discussion will be confined only to aircraft (including helicopters). Boats and cars pose different but similar problems and will be treated separately.

The HO-2 contract covers five major types of losses: (1) buildings, (2) personal property, (3) loss of use, (4) legal liability, (5) medical payments to others. A quick description of the main coverages will suffice.

The HO contract covers the dwelling and other structures pertaining to the main dwelling. Personal property is property that is usual and incidental to the dwelling on or off the premises (i.e., not real property). Loss of use covers you for additional living expenses due to the destruction of your dwelling. Legal liability coverage pays for an individual's legal responsibility (Negligence — failure to use reasonable care) and associated defense costs. Medical Payments to Others pays for necessary medical expenses arising out of the non-business activities of an insured, but only to non-insureds. There is no implication of fault or negligence when medical payments responds.

Personal vs. Business Pursuits. Many modelers sell supplies out of their homes or out of an additional structure on their premises. The HO-2 contract is not a business contract and thus will only cover your personal activities. Business means "trade

profession or occupation." Any person operating a business will usually have a tax number and a license to operate. Even though it may not be your sole source of income, there is no reason why people cannot have more than one occupation. When is this activity considered a business vs. incidental to your non-business pursuits? There is no clear answer.

If it is a business you still have coverage on your main building, but if you have an unattached structure that is used for business purposes even slightly -- there is no coverage for that structure.

As for property which is movable (personal property vs. real property) there are three business exclusions: (1) property stored, held as a sample, for sale, or property to be delivered after a sale, (2) property pertaining to a business conducted on the premises (e.g., typewriters, oscilloscopes, etc.), and (3) property of the business off the premises.

Incidentally, it is also difficult to determine what property is business property versus your own since the business property in a sole proprietorship and partnership is generally indistinguishable from the individual's property.

Legal liability as well as medical payments to others are excluded when it arises out of the business of any insured. The exclusion also goes on to state that "activities which are ordinarily incident to non-business pursuits" is covered (another gray area).

If you are operating out of your premises you have to handle the above problems and more with your insurance agent, otherwise you probably have business insurance contracts covering the business.

Non-Business Activities. Assuming that you are not in the hobby business, the following situations will be explored:

1. Damage to your property.
2. Damage to your property while flying.
3. Legal liability for bodily injury.
4. Legal liability for property damage.
5. Medical expenses.

(1) **Damage to property in your home or off the premises.** The HO-2 contract covers your personal property for 17 perils only for the loss that is excess of the deductible. The amount paid is what it would cost to repair or replace the property less depreciation (actual cash value). Replacement cost coverage can be bought. The problem with this coverage is that "aircraft and parts" are excluded property. The original intent was to exclude full scale aircraft and their parts, but some courts have decided differently. To remedy this, have your insurance agent ask the company to clarify the definition of "aircraft" in writing.

Property off the premises is also covered as stated above, but the amount of insurance is less (10% of the on premises coverage or $1,000 whichever is greater). Again, the definition of "aircraft and parts" poses a problem.

(2) **Damage to aircraft while flying.** Even if the aircraft definition is corrected, there will not be any coverage unless you can show that a peril listed in the contract caused the damage and then only in excess of the deductible. If you are shot down, the peril of interference is not covered. The same would apply if you are flying someone else's aircraft ("we cover personal property owned or used by . . .").

(3) **Legal liability for bodily injury.** The HO-2 policy provides legal liability coverage for personal activities but excludes "arising out of ownership, maintenance, use, loading or unloading of: (1) an aircraft . . ." Again, the definition of aircraft needs to be defined or clarified.

(4) **Legal liability for property damage.** The same problem arises as in number 3 above. But what happens if you negligently shoot someone down? Even if the definition of aircraft is not changed, you could make a case for coverage since you do not own, maintain, use or are loading or unloading an aircraft (also usually no deductible). But one problem may arise if the definition of aircraft is not changed -- the transmitter in your hands could be construed to be an integral part of an aircraft, then you would be owning, maintaining, or using an aircraft and then there would be no coverage.

In the above two situations (3 and 4), the company, if there is an obligation potentially to pay, must also defend you in addition to paying up to the limit stated in the contract. The company's obligation to defend stops when it pays its limit of liability. Defense costs lately are expensive. Price additional limits and you will be surprised how little it costs.

(5) **Medical expenses.** There are two sources of payments for medical expenses in the homeowners contracts. First Aid expense is for immediate medical care and Medical Expenses to others is for expenses up to three years limited by the amount of coverage (usually $500). The same exclusions relating to aircraft apply.

The above discussion has shown that the main problem is making sure that coverage exists is the definition of "aircraft." It is worth looking into. If you can get a written commitment that defines aircraft as not including less than full scale aircraft, you will be sure that coverage exists on your property as well as having additional amounts of legal liability coverage. Your homeowners will be primary, your umbrella will generally conform to the underlying coverage (if you have one) and AMA coverage will be excess.

	AMA
$	UMBRELLA
	HOMEOWNERS

A Word About Watercraft. Watercraft as covered property is not excluded, but there is a $500 limit "on watercraft, including their trailers, furnishings, equipment and outboard motors." As for liability coverage and medical expense coverage -- just as long as your watercraft is less than 26 feet and/or has less than 25 horsepower you have coverage (no real problem).

A Word About Cars. As for insured property, technically there is no coverage unless (1) it's used to service the insured's residence and (2) not licensed for road use. I don't think you could make an argument for #1. The only time you have legal liability coverage is when you are using the model on your insured location.

About the Perils. As mentioned previously there are 17 perils insured against under the HO-2 for damage to your buildings and personal property. Under the peril of theft occurring off the insured's premises, there is no coverage for watercraft, including its accessories, equipment and outboard motors. If you change the definition of watercraft you will be sure to have coverage for theft off the premises. Also, if your watercraft (or any personal property) is stolen out of a car there generally has to be forcible entry.

Secondly, do not change the definition of "aircraft" under the perils section. If you do, you may be eliminating coverage for mid-air collisions. More importantly you may eliminate coverage for a model aircraft damaging your building and personal property.

In addition to the above coverages, the homeowners contract provides coverage for damage to property of others for $250. The clause pays for property damage caused by an insured to property essentially borrowed

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THE FINISHING TOUCH — PAINT

Part 1

By Richard Buescher, D.D.S.

In a recent conversation with another modeler, the topic of finishing techniques came up. He had been trying to find a book on the subject and I realized that I didn't remember seeing any specific book published on this topic. There have been numerous explanations in construction articles and in kit instructions but I think these are mostly carry-overs of antiquated methods that are over-simplified for easy publication. The concept of finishing a model by "lightly sanding entire model with #220 sandpaper, giving it two coats of clear dope followed by a light sanding with #400 sandpaper, and then painting with your favorite color" is not my idea of finishing an airplane. I rate this technique on the same level as hearing someone claim their airplane is "trimmed out" just because it flies straight and level when the sticks are neutralized. Of course this same airplane will probably do a barrel roll to the right when you try an inside loop. It all depends on your definitions and standards.

There are a number of reasons **not** to put a good paint finish on an airplane. It is time consuming and messy; the materials and equipment are expensive; it adds excess weight (mostly to the tail); if the airplane is expendable or you crash a lot it's really a waste of time.

To begin with we will discuss the characteristics of the traditional two categories of color topcoats: lacquers and enamels.

Lacquers — includes all lacquers and dopes. Very fast drying because of highly volatile vehicle (thinner) but cover poorly because of high percentage of thinner, and thus require many coats to obtain desired paint thickness. They are sensitive to temperature and humidity. "Blushing" (fogging) occurs when humidity is high because evaporative cooling of the thinner condenses water vapor from the air and entraps it into the finish. When lacquer dries it has poor gloss and requires sanding and rubbing out with rubbing compound (DuPont 202S), to obtain desired shine. A lot of work. Small surface imperfections are not covered over by lacquers because of its low viscosity and high shrinkage on drying. So surface preparation is more critical. Advantages: it is easy to spray with small orifice spray guns and low pressure/volume "hobby" type airbrushes (Badger, Miller). Less likely to get runs and sags with lacquer because of its fast evaporation which gives it the fast drying characteristics. Lacquer is still a classic finish but impractical for the average modeler because of the number of coats (12-18 for a "Toledo finish") and all of the sanding and rubbing out between coats.

Enamels — slow drying; excellent coverage and flow out in just two or three coats; dry to a high gloss. Cover minor surface imperfections well because of greater viscosity, but need more pressure and larger orifice gun to spray without over-thinning. Not critical to humidity, but very easy to get runs and sags if you get "impatient" when spraying. Sensitive to small changes in reducing (thinning) because of the smaller proportion of thinner to paint. Enamel is only 1/3 low volatile thinner compared to lacquer which is 2/3 highly volatile thinner. Enamels are very susceptible to airborne contaminants: dust, cat hair, and flying insects.

So where are we at today? Epoxies, acrylics, polyurethanes. They all dry to varying degrees, by a process called polymerization --- the linking up of molecular resin chains (curing).

Epoxy Paints — (i.e., K & B Super Poxy and Hobbypoxy). These are two part systems. They are hybrids in that they more closely resemble the classic enamels but share many of the characteristics of laquers, resulting from the incorporation of a **highly** volatile thinner. They "dry" mostly by polymerization, but the more they are thinned the more they take on characteristics of lacquer, especially susceptibility to blushing. When used properly they have excellent coverage and flow, and cure to a superior gloss, if **not thinned too much**, and produce a very hard, durable finish that doesn't shrink. I only thin 10%-20% depending on temperature. I also use a big enough spray gun, which takes maximum advantage of its coverage, flow and gloss. If you thin more than the 10%-20%, you waste a lot of paint and are more likely to get runs and sags. To realize the full potential of epoxy paints on anything larger than a 1/2A airplane, you need a spray gun larger than the "hobby type" airbrushes. Super Poxy is my favorite; I have used it for ten years. All of K & B's finishing products are the workhorses in my finishing armamentarium.

Acrylics — basically modified lacquers and enamels with improved flexibility and durability. **Acrylic enamel** deserves some discussion here. It is a superb color topcoat when used with the gloss hardener additive (polyurethane catalyst), which accelerates the paint curing time significantly. The additive is an aliphatic polyisocyanate --- same as in Imron — so the same safety precautions apply as to its toxicity. In defense of this technique I should point out that you only use approximately 10% isocyanate in acrylic enamel compared to 25% in Imron. I am not advocating this technique for the average person because of the potential health hazards, but you should know about its properties. This combination does produce **outstanding** coverage, flow, gloss, and durability. It is expensive: the additive is $16.00 and a quart of acrylic enamel varies between $8.00 to $10.00 per quart.

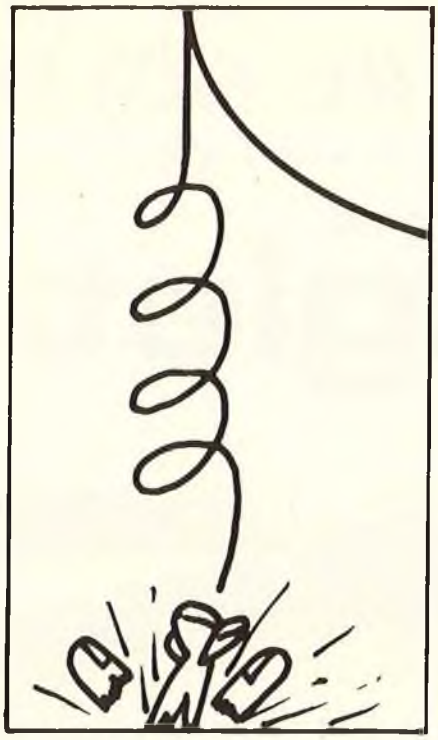
Polyurethane Enamel — (i.e., Imron and Alumigrip). Outstanding properties. Even harder than acrylic enamel with additive, but more toxic and more expensive. For professional use only --- and only with suitable equipment and knowledge.

Polyurethane Alkyd Resins — (i.e., Pactra Formula U, Perfect R & S, and Sears). Working characteristics same as enamel. Mineral spirits are used as a solvent base (vehicle). Excellent coverage and flow, with only good gloss; the colors lack brilliance and depth. I think they look grey and "dingy" compared to Super Poxy. Advantages: safe, little odor, can be brushed on, sprayed, or comes in spray cans. Will not attack foam. If you don't have spray equipment or a location to do spray painting then consider these paints. They will provide a very adequate and respectable color topcoat.

Coming soon --- spray guns and surface preparation techniques. □

STAYING OUT OF TROUBLE
AVOIDING THE STALL SPIN ACCIDENT

By Roger Tennyson D.D.S.



As our radio control equipment has progessed in its ability to precisely control airplanes, we have been able to leave the stable, free-flight conversions of the fifties and sixties to enter the world of truly scale aircraft. We are now beginning to encounter kits which are true scale, and which fly with all the advantages (and disadvantages) of the full-sized aircraft itself. It is, therefore, extremely important for those of us who wish to fly these planes, and especially those who wish to fly these types aerobatically, to fully understand their aerodynamic shortcomings.

These are no longer simply "Sport Scale" aircraft which we are flying. They may look the same, but **stability** has not been designed into them, because a stable aircraft is all but worthless in an aerobatic regime. These ships have been built without **any** stabilizing **wash-out** at the wing tips, and they generally have a lot of **control surface movement.** This allows the aircraft to enjoy full aerobatic capabilities, but it can create some aerobatics which are neither scheduled nor enjoyable. The worst of these unscheduled aerobatics is the sudden and often vicious **snap-roll** on the mere application of "up elevator." This can occur from level flight, but in these aerobatic machines, a sharp pull-up from a dive can result in the same problem! And the speed at which you are flying will not affect the prevention of these problems.

Here are two typical scenarios: On the base leg of the landing pattern, the pilot initiates a 90° right turn, giving a bit of "back stick" as is usual in turns. The flier is amazed to see the plane gracefully continue the turn and convert it into an equally graceful roll onto its back, the ailerons apparently not answering the stick's movement. Or this one: The pilot is attempting an inside square loop; as the airplane finishes the vertical climb, the flier pulls back on the stick to begin the inverted "lay-out," equally amazing himself with a sudden snap-roll. The nose falls through, and as the speed builds up rapidly, the flier horses back on the stick, since the ground is now distressingly near, and is now provided with the ultimate (and last) surprise that this aircraft will ever give him, the **secondary snap,** resulting from an **accelerated stall.**

I submit to you that although the situations appear to be quite different, the culprit in both cases is the same: the **plain ol' stall.** True, it's not quite as you expected it to happen, but we're still dealing with the same phenomenon which probably cost you your first trainer.

At the outset, let us get one thing straight. Both types of stalls result from the same error in flying, i.e., an **excessive angle of attack** for the speed regime being flown. Another way of describing it would be to say that "the nose got too high," or more specifically, too much "back stick." The difference is that the **slow speed stall** occurred because the pilot didn't do enough . . . he didn't drop the nose of the plane to maintain flying speed, whereas the **high speed stall** happened when he did too much: too abrupt and too much "up elevator." In both cases, had he been flying a trainer type or even a properly designed Stand-Off Scale ship with adequate "wash-out," probably all that would have resulted from either indiscretion would have been some sloppy flying and some "mushing." A stall with an aerobatic ship converts almost immediately into a snap-roll towards the low wing.

Just to make you feel better, we're far from alone in these problems. In full sized aircraft (wherein you must experience your crashes first hand, not merely observing them from a distance), the stall-spin accident is probably responsible for more deaths than anything short of "drinkin' and flyin'." A lot of old timers aren't with us anymore because they got a bit slow on final (although they certainly didn't realize it) and the plane stopped flying. And these guys **had** airspeed

indicators. They should have **known**they were getting slow. So the airplane stalled, and a wing dropped, and the natural reaction is to try to lift it with aileron. Natural, and **dead wrong.**

How come, you ask? Ailerons are used to correct a bank, aren't they? Not in this case --- because of a condition which is called **adverse yaw.** Here's why it occurs, and why it never bothered you so long as you flew trainers, sport ships, or Stand-Off Scale jobs (which contained wash-out at the tips to make the center section stall before the tips did). What it amounts to is that the wing which is on the outside of the turn (the wing which rises) has its aileron deflected **downward,** and this creates **lift.** Since **lift creates drag** (pull the nose of an airplane up, it slows down, right?), the wing on the outer side of the turn is actually dragging **backward** from the line of flight, and the nose of the ship begins to **rise** in respect to the horizon. You are now **yawing against the turn.** The longer the wing, the worse the yaw. The whole aircraft is **also going to slow,** since you are now going through the air slightly sideways. More drag. In full-sized aircraft, the rudder is used to actually "lift" the tail, thereby streamlining the fuselage, eliminating the yaw. The reason why we as R/C pilots don't have to coordinate rudder and aileron for the turn is because up to this point, most of our models **were designed to eliminate adverse yaw,** whether or not you realized it. Several things, or a combination of things, have been used: **strip ailerons** --- these require less deflection than "barn-door" types, and since the prop blast over the root area does a lot of the work (and that's amidships, away from the sensitive tips), the adverse yaw is reduced greatly. **Aileron differential** --- the downgoing aileron is rigged to deflect **less** than the upgoing. This equalizes the drag, and with proper adjusted differential, the yaw problem can be completely eliminated. **Fuselage length vs. wing span** --- ever notice that pattern ships have long, slim fuselages . . . long, that is, in respect to their wingspans? And most sailplane models don't bother with ailerons (unless they use strips), relying on rudder for the turns? Does this **now** tell you something?

But when you start flying our "new breed" of sport scale airplanes (especially the monoplanes) which are very closely proportioned to the real thing, you leave stability behind. And should you want to do aerobatics with these birds (we all really **want** to fly like Art Scholl, anyway, right?), unless you are either lucky or have a good understanding of what is going on, your creation will not be with you very long. These new planes can't have any wash-out to stabilize slow flight, because it would work against you when you are upside down. No strip ailerons either --- they aren't scale. No differential ailerons --- doubles the adverse yaw when inverted! And the long fuselage? Nowhere to be found in the true aerobatic type. Take a look at the planform of the Zlin 526, keeping in mind what we've been discussing: long, thin wings, **leading edge sweep,** barn-door ailerons, and a short fuselage! Might not be too good a choice for your first trainer, hey? So how do we stay out of trouble with these beautiful planes which have such eye-catching paint schemes? Let's go back to our two fliers to see whether or not we can avoid the problems.

Here comes "Feckless Harry's" new Stephen's Akro on base, about to turn final. When the slow speed snap occurred as he banked, you can now see what happened. The lowering of the aileron didn't raise the stalling wing, it aggravated the problem! It simply added more drag to the wing, sucking the plane **into** the very problem the pilot wanted to avoid. What Harry could have done was to **raise the falling wing with rudder.** The rudder **isn't stalled,** and it will lift the wing pronto. An obvious bit of advice: **Gently.** Rudder heap powerful medicine, white man. Too much and you snap the **other** way! Equally, obviously, what Harry **should** have done was to **realize that he was flying a very unforgiving airplane, going upstairs on that first flight, slowing down to try out the characteristics of the ship when it was in landing configuration.** He could then have known to keep his speed up, and would doubtlessly have planned wider turns (shallower bank angle). Incidentally, when you stall a ship into a snap, you'll swear that your aileron servo quit. It didn't. It was the wing wot quit, mate.

A word here about bank angle, while we're at it. **As the angle of bank increases, the stall speed of the aircraft goes up.** The steeper the bank, the more you have to watch to see that the nose **is not** allowed to rise, due to adverse yaw. Coordinate your rudder in the turns. It helsp to keep the speed up. If you're not used to using rudder in the turns, **practice it up in the air first,** not in the landing pattern! It'll take some time for you to get the idea, but if you begin "thinking rudder" you'll have the right reactions when that snap **does** surprise you. There are two kinds of fliers who have never exerienced a snap on final: The kind who have never flown, or the kind who have never flown long enough!

The second type of surprise snap-related accident occurred, as we saw, not at low, but at high speed. This is the **accelerated stall.** It's not caused so much by what you don't do, as by overdoing what you **do** do. Basically, it is caused by **the use of too much elevator travel,** which forces the wing past its critical angle of attack. Couple a super-sensitive elevator which is necessary to do all those nice crisp snaps and corners in aerobatics with a short-coupled aircraft devoid of any stabilizing wing wash-out and you have a dicy situation at best. And at worst, it can become too much to handle.

Looks like you're caught between a rock and a hard place on this one? Not at all . . . **now.** But you are going to have to spend some money to solve the problem. What you need is one of the new **dual rate** radios, or avoiding that, send in "ol' reliable," having your radio man install dual rates. Set the elevator travel so that on low rate you **can't** get into trouble, and on high rate you can't stay out of it. The only time you'll need the excessive travel will be in the squares and snaps, since the spins can be entered with a lot less, and with careful speed management, you ought not to fall out of the air. You'll be less likely to fumble the landing on low rate elevator, too.

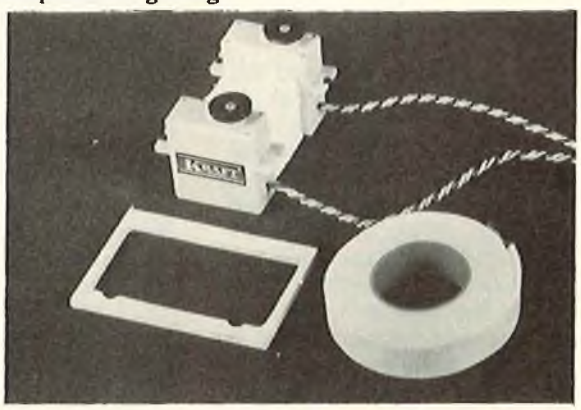
I am not fully convinced that the new exponential rate radios are the way to go, but that's only an opinion. Murphy's Law: "If anything can go wrong, it will." Sooner or later, if you get excited enough in that spin, you'll pull in too much elevator and suffer the accelerated stall right where you don't want it . . . at low altitude. Bound to happen, so lock out the possibility with low rate. There are two kinds of fliers who have never gotten excited in a spin, the kind . . .

A last comment. On the 19th of July at the Pioneer's Field in Santa Clara, we held an IMAC aerobatic contest. We flew 88 full routines, and there wasn't a single instance of "aileron servo failure," or so much as a scraped wing tip. And these guys spent the whole day in anything but upright flight, finishing most of the maneuvers at fifty feet. These aerobatic scale airplanes **can** be flown safely; it simply takes an understanding of the problems involved and practice in flying to accomplish it. □

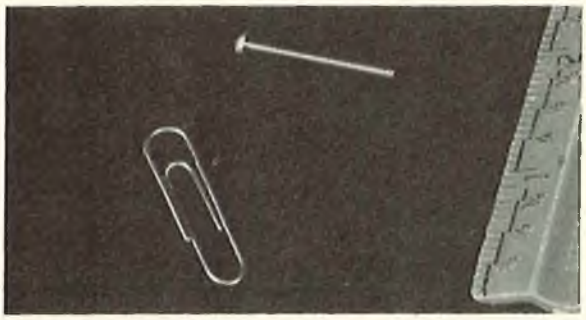
INSTALLING SMALL SERVOS

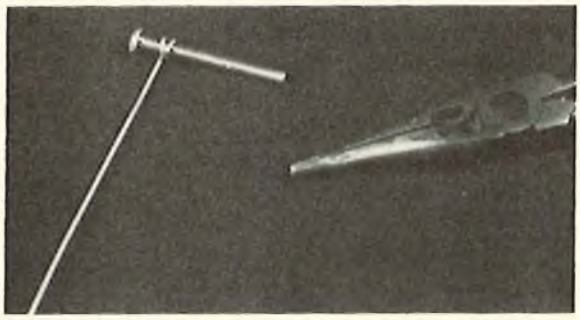
By L.F. Randolph

Even though "big is beautiful," good things still come in small packages. The new ultra small servos are good and they do come in small packages but they can present some installation problems. The photos show how to install these little sampsons to get all the performance they are capable of giving.

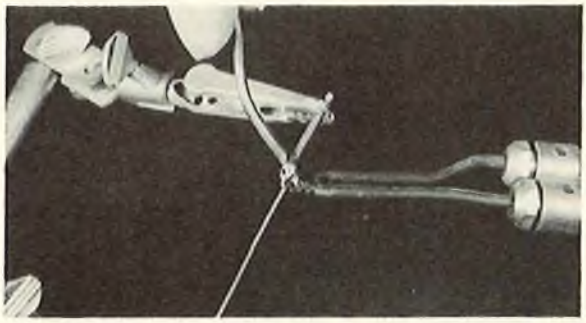


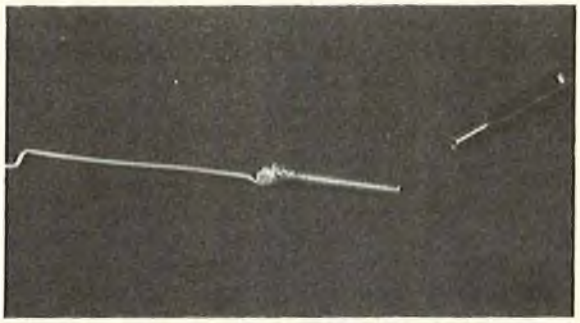
LEFT: Not very big but plenty of power for .15 and down size airplanes. The single grommet mounting at each end of the servo tends to allow them to rock when a one-sided load is applied to the output arm. RIGHT: The solution. Servo tape (double stick) and a block of foam make a very solid tray mount. Three servos can be mounted side by side using just tape between them, or a combination of tape and foam to change their spacing.



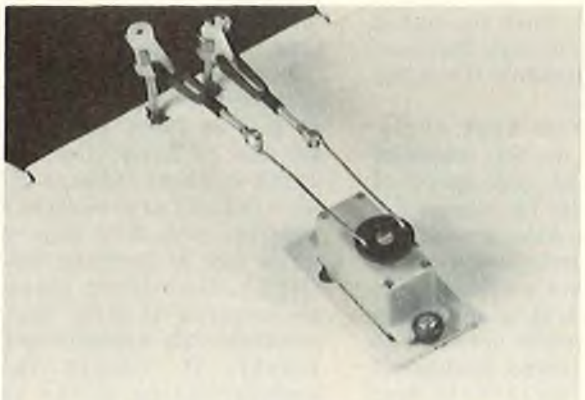


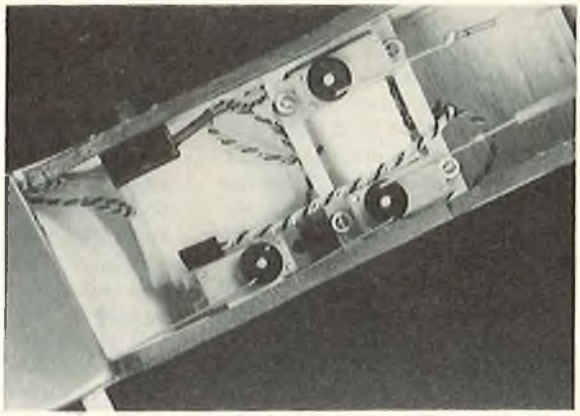
LEFT: The small holes in the output arms match the size of wire used in the standard paper clip (#1 Gem clip) so a 1" 2-56 screw and a paper clip will match the output arm to clevises and NyRods. RIGHT: Straighten the paper clip and take a turn around the head end of the screw. The wire is rather stiff, as it should be, so use pliers. Cut the head off of the screw and bend the wire straight out behind.





LEFT: Solder the wire to the screw. The use of a "third hand" is quite helpful. Use rosen-core solder and clean the screw and wire well before soldering. Use plenty of heat and get a good shiny joint. RIGHT: The completed link. Make a "Z" bend in the wire to attach it to the output arm of the servo and the screw end will match either NyRod or clevis.

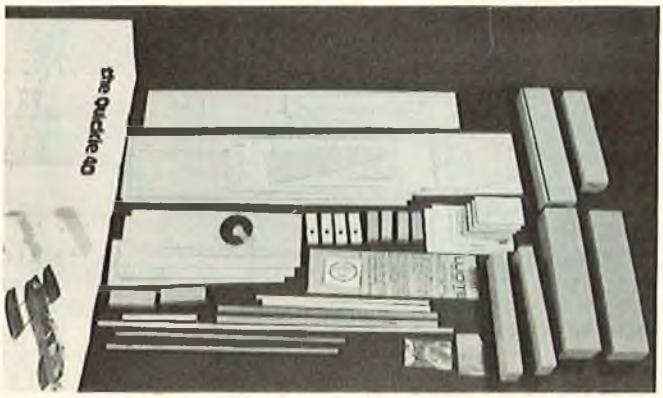




LEFT: The single grommet mount works fine when the output is balanced as in this aileron installation. The paper clip wire is stiff enough that the servo will move the wing when the aileron is held firm. RIGHT: In the fuselage installation, the rudder and elevator servos are rail mounted which makes it easy to move them from one airplane to another. The throttle servo is mounted to the side of the fuselage with servo tape (handy but difficult to move). The wire-screw links join the servos and the Nyrods. The installation was made to convert Marooney (May '81 RCM) from three channel to full house.

RCM PRODUCT REVIEW

Dumas Products QUICKIE 40



SPECIFICATIONS

Name	QUICKIE 40
Boat Type	Outrigger Hydroplane
Manufactured By	Dumas Products, Inc. 909 East 17th St. Tucson, Arizona 85719
Mfg. Suggested Retail Price	$45.00
Available From	Both Mfg. & Retail
Hull Length	30 Inches
Beam	18½ Inches
Mfg. Rec. Engine Range	3.5cc to 7.5cc
Recommended Fuel Tank Size	10 Oz.
Recommended No. of Channels	2
Rec. Control Functions	Rudder & Throttle
Basic Materials Used In Construction:	
Hull	Ply, Plastic radio hatch cover
Sponsons	Ply & Foam
Building Instructions on Plan Sheets	Yes
Instruction Manual	No
Construction Drawings	Yes

RCM PROTOTYPE

Radio Used	Cirrus 4 channel
Engine Make & Displacement	K & B .40S
Tank Size Used	10 Oz.
Weight, Ready to Run	70 Ounces

SUMMARY

WE LIKED THE:
Ease of assembly, quick to build, and good performance.
WE DIDN'T LIKE THE:
Tight radio compartment.

The Quickie 40 is an outrigger hydroplane boat kit produced by Dumas Products, Inc., 909 East 17th Street, Tucson, Arizona 85719. The Quickie can be run with a front rotor .40 engine, 3.5cc, 6.5cc, or 7.5cc engine. Length is 30" and beam is 18½". There are two Dumas outdrive hardware kits available for the Quickie. A #2321 for 3.5cc and front rotor .40s and a #2325 for the 6.5cc and 7.5cc engines. Our prototype used the #2325 kit. The kit box is only 8" x 3½" x 38", and contains the plywood, foam, clear plastic radio cover and miscellaneous metal parts. The outdrive hardware box can be fitted into the kit box for ease of shipping.

Construction:

The plan sheet drawings are about one-third full size. With the foam-plywood construction, full size drawings are not necessary and all required dimensions are shown. The written instructions for building, finishing and running are contained on the plan sheet. The plywood parts were die-cut and no problems were encountered when punching them out. The hull was built entirely with 5-minute epoxy. The sponson sides were glued with 5-minute epoxy and contact cement was used to glue the plywood to the foam. For ease of assembly of the right sponson, complete Figure 8 after Figure 2. This makes it a lot easier to install the dowels. Also in Step 6 the dimension should be 7⅞" not 6⅞".

The outdrive hardware kit includes a 3/16" (.187) shaft, stuffing box, strut, (2) thrust washers, rudder bracket, rudder and shaft, water pickup, rudder arm, drive dog, and a propeller nut. Additional parts required were propeller (metal), flywheel, and engine coupler to fit engine and prop shaft. The prototype used a Dumas flywheel (2505) and 1-15/16" dia. bronze propeller (3106). An Octura collet was used to connect the engine to the running gear.

Covering:

The hull and sponsons were covered with 2 oz. glass cloth. If you are going to use a 3.5cc or front rotor .40 engine, 3/4 oz. glass cloth is sufficient. The glass cloth was applied with K & B resin using the toilet paper trick. A second coat of resin was applied followed by K & B primer. K & B black, yellow, red, and blue colors were sprayed on and then a clear coat of Ditzler Delclear was applied.

Engine:

A K & B .40S with an International Products Expansion Chamber (IP 604P) was used for power. With the .40S being side exhaust it made it impractical to use the engine cover that is supplied in the kit. A Sullivan 10 oz. slant tank was used up front of the engine in the tank compartment. The tank compartment is short and a 10 oz. tank is a tight fit.

Radio:

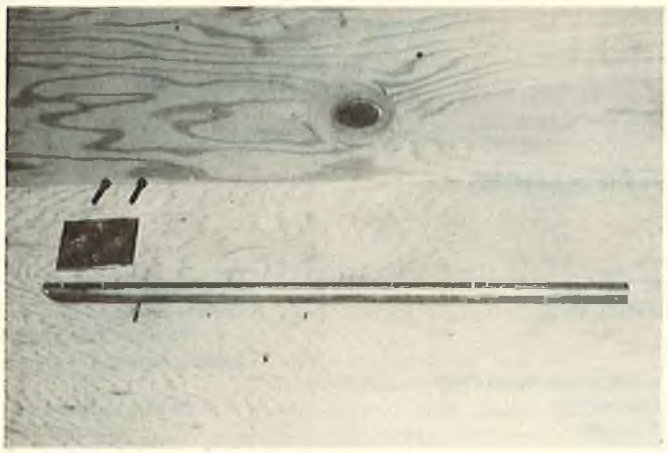
Our radio was a Cirrus 4 channel using throttle and rudder. The radio compartment is not sufficient for this size radio. The battery pack (450 ma) had to be crammed into position. With a smaller receiver the radio compartment would be ample.

Running:

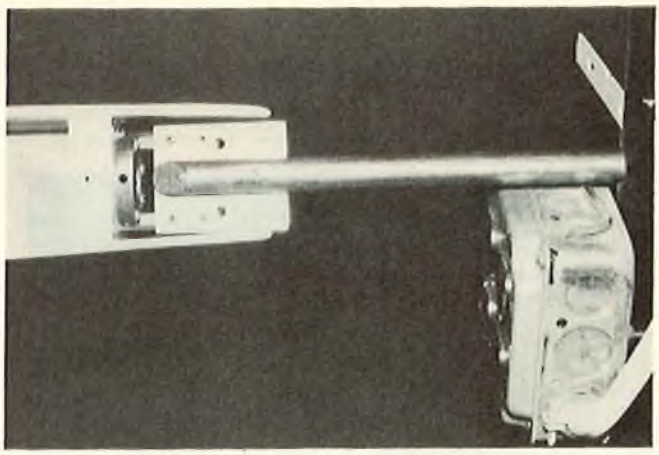
The C.G. came out close to the location shown on the plans. The Quickie runs straight and steady, and control is good as set up per the plans. The Quickie has not been entered into competition as of yet. When this occurs, control movement will be changed to suit the driver.

Conclusion:

The Quickie 40 is advertised as quick to build and quick on the water. The kit is easy to build and construction is fast. Using the Dumas outdrive hardware kit, the Quickie is an excellent combination for a beginner to enter outrigger hydro competition or fun running. □



The basic parts for The Third Hand.



Top view showing mounting plate attached to top of engine mount and rod inserted in pipe.

THE THIRD HAND

By L. David Trabert

The photos show the "Third hand" I used to hold a fuselage above my workbench. This simple holding fixture was built in several hours using readily available scrap materials. Sizes shown can be varied to suit individual requirements. This device was originally built to aid in painting chores — to keep wet paint off the fingers and to avoid touchy surfaces already painted — but this gadget has proven invaluable in holding the fuselage while sanding, painting, installing radio gear, pilots, canopies, etc.

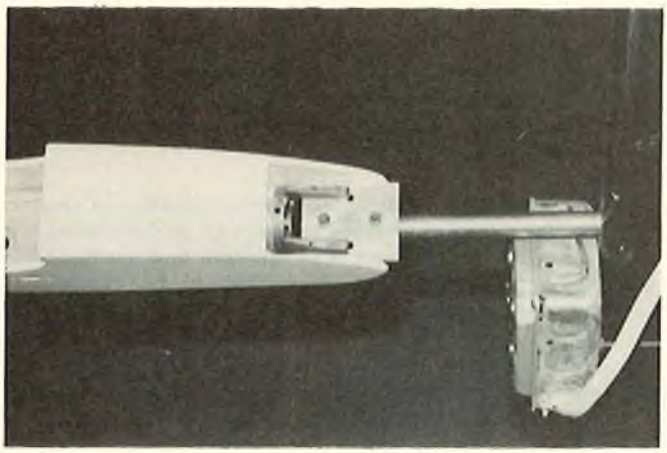
In use, the rectangular plate is drilled with four clearance holes to fit the mounting bolt pattern of the engine. Pick up the hole locations from the drilled and tapped motor mount. Notice the plate is rectangular rather than square. The two different widths are sized to fit most engines in the .19-.60 size range. The four 10-32 clearance holes are symmetrically located with two along each major centerline of the plate. This spacing allows the plate to be attached to the 5/8" diameter rod in four directions so the same plate can be used with at least four mounting bolt patterns.

In my case I had a 3" diameter pipe at the end of my workbench that ran from the floor to the ceiling. It was a simple matter to drill holes for the 5/8" rod to plug into. There are numerous methods of supporting the "Third Hand." A simple way would be to attach a length of 2 x 4 lumber to the end of your workbench or to the wall.

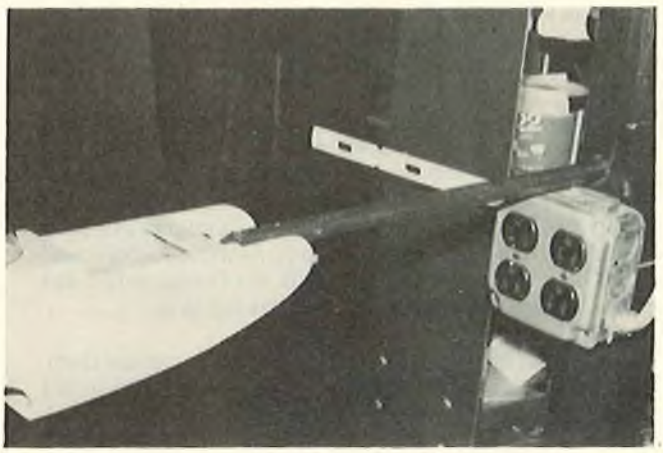
Before you drill a hole in the pipe that the 5/8" diameter rod plugs into, or whatever support best suits your shop, measure the distance from the fuselage centerline to the stabilizer tip of the largest ship you will be working with and add a few extra inches for clearance above your workbench. Better still, drill several holes at heights and work angles to suit your needs.

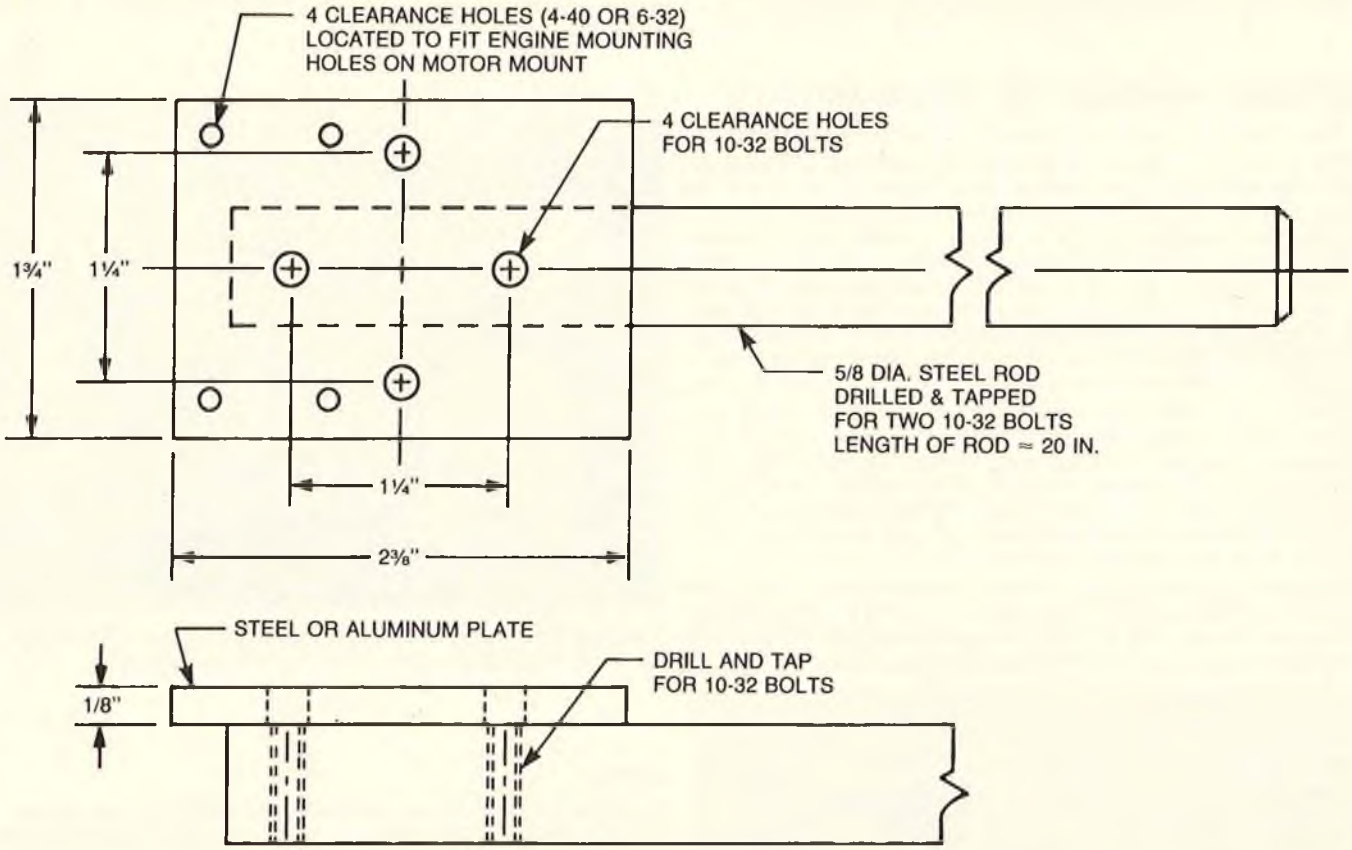
If you wish to do a bit more work to gain greater freedom of movement, a length of 3" diameter pipe (threaded at the upper end) could be attached to the end of your workbench. Thread onto that a coupling with a 15" to 20" length of pipe (with holes for the bar drilled in it) screwed into it, and you will be able to swing your work close to you, or out of the way. Try it! You'll wonder how you got along without the "Third Hand." □

Bottom view of mounting plate attached to engine mount.



If you have a vertical pipe in your shop, make sure it isn't a water pipe before you drill into it.





HOW TO FLIGHT TRIM

By James V. Reiss, M.D.

Ten years have elapsed since the classic article by the late Jim Kirkland on flight trim. The basic theories have not changed, but current pattern demands have. At this stage of development, to compete successfully in a pattern competition, the pilot and his aircraft must be honed to near perfection. Much information has been written on this subject, but many times it has been inaccurate or difficult to understand. There are only two good concise sources on this subject, Kirkland's article and R/C Modeler's "Flight Training Course, Vol. II."

To achieve ultimate flight trim for any given model aircraft you must have a few basic concepts and minimum number of flight tests. The secret of success is your understanding of these basic concepts as they apply to your flight tests.

The following method of flight trim has evolved over the last several years. Only those concepts that were easy to understand and use were borrowed from various authors. Many of us do not have a local expert to unlock the secrets of flight trimming. Hopefully, this will concentrate these principles in an easy to understand dialogue.

The model aircraft that you intend to trim must be constructed as accurately as possible. Any warps or misalignments will soon become apparent.

Your goals should be:

(1) 0-0 settings for elevator, ailerons, and rudder; all control surfaces should be void of gaps (if not, seal with tape).

To achieve ultimate flight trim for any given model aircraft you must have a few basic concepts and minimum number of flight tests.

(2) Achieve proper deflection angles:

(a) **elevator** — maximum movement determined by spin maneuver. Keep elevator response equal on control stick.

(b) **rudder** — less than 35°, stall turn requires maximum movement.

(c) **ailerons** — three horizontal rolls in 4-5 seconds.

The trimming process is achieved by a series of flight levels. Make sure your plane is trimmed to a lower level before advancing to a higher level.

Flight Level I

(1) Trim for hands-off level flight full throttle. If the ailerons are trimmed away from neutral, look for:

(a) A warped wing; (b) engine torque problems; (c) elevator halves which may be twisted; (d) elevator halves not in line with the wing. If the elevators are not neutral you may need to shift the Center of Gravity. Keep rudder 0-0 during the trimming process.

(2) If plane is trimmed for upright flight, inverted flight should be the same except that a slight amount of down elevator pressure will be required.

(3) Center of Gravity check — place plane in a sharp bank and hold. If the nose goes down it is nose heavy, if the tail goes down it is tail heavy.

(4) Fly wide open, then close throttle. The plane should continue in a straight level flight. To correct, add down or up thrust of the engine and retrim the elevator.

(5) Recognize heavy wing — correct with screws or finishing nails.

(a) Do several sharp vertical climbs.

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PRODUCT REPORT

L.R. TAYLOR'S RETRO-FIT DUAL RATE SYSTEM

By Ben Strasser

Since the dual rate feature is a relatively new addition to R/C, we want to begin this product report with a few comments about what the "dual rate" does. Included only on more expensive R/C systems, when the dual rate is switched on, the throw of the control surface operated by the switch is decreased. The amount of decrease in throw is adjustable so you can set it just where you want it. Thus, with the linkage set up for maximum throw and the dual rate switch in the off position, maximum throw of the control surface is realized. With the switch in the "on" position, the throw is decreased; according to how it has been set.

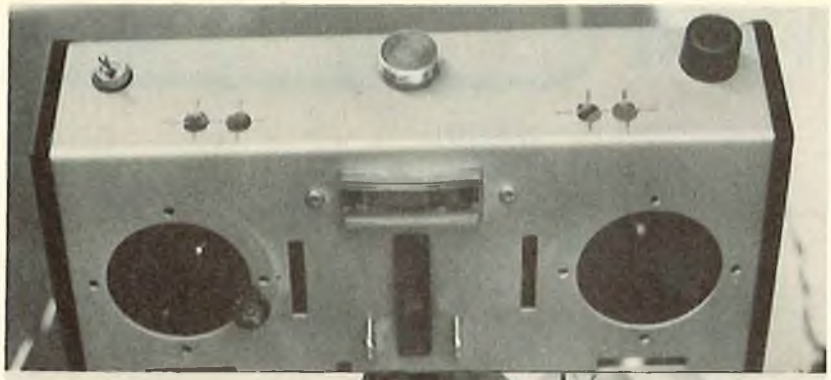
Having the dual rate capability on an R/C system makes it possible for a modeler to fly with maximum throw for maneuvers that require all of the control surface movement possible, such as flying a snap roll. Then, by simply throwing a switch on top of the transmitter, the throw is decreased to make those maneuvers that require less control surface movement smoother and easier to fly. The best of both worlds.

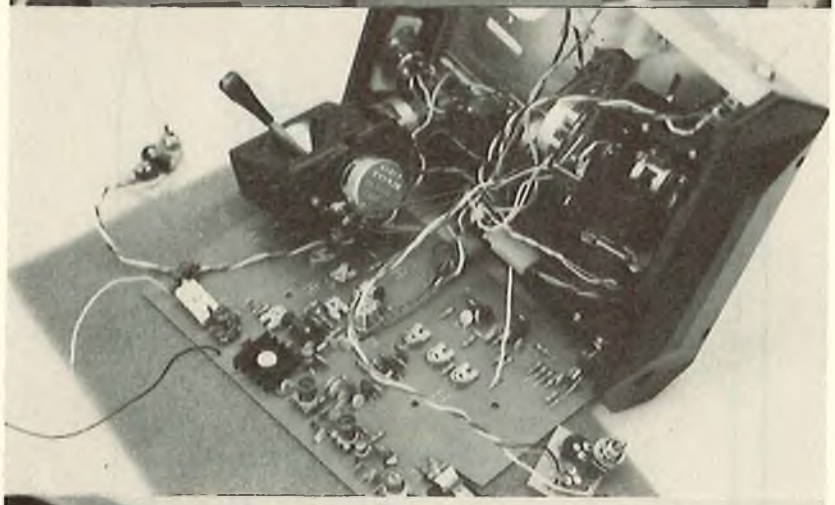
Dual rate may be used on the rudder, elevator, and/or aileron controls or on any of the lever-operated auxiliary channels, depending on how the transmitter is set up. Boaters and pylon racers find the dual rate useful because they can switch to the low rate when running for the flag and can switch to the high rate when coming home or to putt around at low throttle settings. Other than the dual rate capability, some modelers just use the system switched "on" because it offers the advantage of being able to "fine tune" the control surface throw to what the pilot feels comfortable with without changing the linkage at the servo arm or control horn. That's one reason why many helicopter pilots look for transmitters with this feature; to get the tail rotor adjusted "just right." Unfortunately, the only way to get this neat feature on a transmitter is to put out the bucks for a new R/C system or pay about $40.00 per dual rate installation to have the factory do an add-on job for you. That was the case until L.R. Taylor's do-it-yourself retro-fit Dual Rate System came along.

L.R. Taylor's retro-fit Dual Rate System measures 1" x 1⅛" and is 3/4" high to the top of the switch body. Each system is one unit for use on one transmitter function and comes completely assembled. Surprisingly simple in design, the unit has a PC board base, DPDT switch, two pots, a resistor, and three leads. The simple installation begins by temporarily removing the transmitter P/C board and gimbal screws and ground and antenna wires for access. Two holes are then drilled in the top of the transmitter for each of the dual rates to be added. One hole is for the switch and the other is for access to the pot used to adjust the throw. To connect the unit, three wires are added to the appropriate pot. Other than adding the three leads to the pot, no other modifications in the transmitter circuitry are required.

We installed the Dual Rate System on our elevator and aileron controls. Reading through the installation instructions a couple of times, installing the two units on my Futuba transmitter, and completing the preflight adjustments took us a little over an hour. Not what you'd call a time consuming job. The step-by-step instructions are easy to follow and require only the ability to use a screwdriver, electric drill, soldering iron, and the ability to find the right color-coded wire on the appropriate pot.

We followed Taylor's instructions to a "T," but with one exception. The instructions suggest drilling the holes in the transmitter case and installing the unit before the three leads are soldered in place. We preferred to make the solder connections first, test the unit (so we wouldn't be left with holes if we didn't like it), then drill the holes. Follow the adjustment procedure outlined in the instructions to center the control surface. To adjust the throw, set it up with nearly full throw for your first flights. Then, gradually back down the throw until you get it where you want it. When adjusting the dual rate throw on a Hobby Lobby Telemaster .40, we found that to decrease the throw about 20% makes the plane act like the control surface movement was





decreased by 50%. Just about the same was true on a Bridi Hobby Dirty Birdy .40. Fly adjust, fly, adjust, fly, . . . is the way to go.

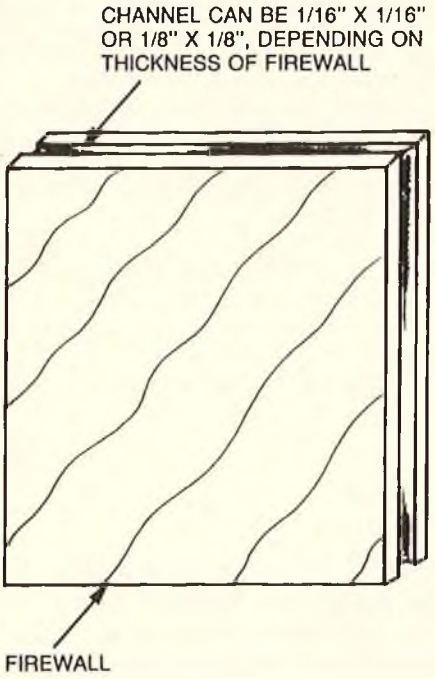
In the way of a summary, the L.R. Taylor retro-fit Dual Rate System installs easily and does the job. If you want to add the dual rate feature to your radio, it's a simple and relatively inexpensive way to go. You will need one unit (the word "system" refers to one unit) for each function you want to modify. Presently L.R. Taylor's Dual Rate System is available for Futuba Radio models FP-T6EN, FP-T5EN, FP-T4EN, FP-T2E, FP-T2F, and Hobby Shack's Aerosport and Cirrus radios. Although we haven't experimented, because of the simplicity of the unit we expect that it could also be used on several other R/C systems. And, since most transmitters have more room along the top inside than the Futuba FP-T6EN, installation can only be easier. If you want to find out if Taylor's retro-fit Dual Rate System will work on your radio, contact your local hobby shop or write or phone Taylor directly. The L.R. Taylor Co., is located at 20831½ Roscoe Blvd., Canoga Park, California 91306, (213) 360-1178. L.R. Taylor's Dual Rate System sells for $19.95 per single function, half the cost of a factory mod. □

(Editor's Note: If your radio is still under factory warranty, check with the manufacturer before doing any alterations or additions to your radio. This could possibly void the warranty.)

PHOTO #1 — Holes marked and drilled in Futaba 6 channel transmitter case. PHOTO #2 — Transmitter opened up and dual rate units soldered to the appropriate gimbal pots. PHOTO #3 — Dual rate unit mounted in place. Everything ready to put back together. Unit is to the left of retract switch. PHOTO #4 — Installation complete and very professional looking. Hole to right of switch is for access to the pot to adjust the throw.

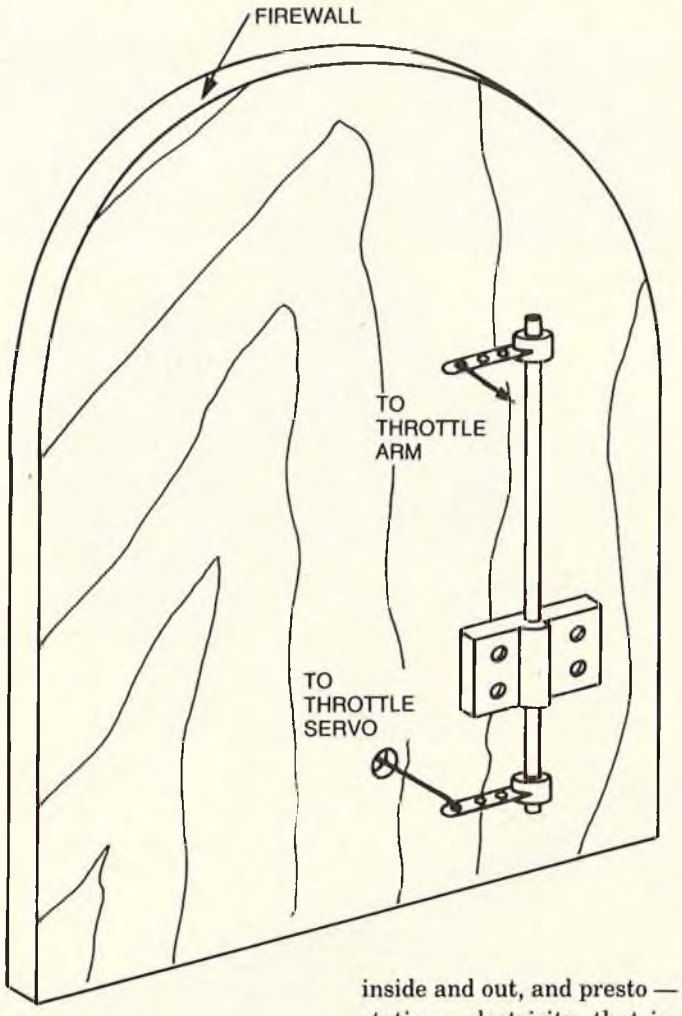
FOR WHAT IT'S WORTH

Too many guys don't really anchor their firewalls properly; they put a big wad of epoxy in there but it usually doesn't impart much strength. So here's a way to do the job: After everything is double-checked for fit, and just before mixing the epoxy, cut about a 1/16" to a 1/8" channel on all (usually) four sides of the ply firewall (see sketch). The width of the channel can vary, depending on the width of the firewall. This channel is filled with epoxy during installation and really locks the firewall in place. It's especially good for big, heavier quarter-size birds. This goody was sent in by Al Alman of Arlington, Texas.



USUALLY ALL FOUR SIDES OF THE FIREWALL ARE GLUED TO THE FUSELAGE, SO ALL FOUR SIDES SHOULD BE CHANNELED. IF ONLY THREE SIDES ARE PERMANENTLY AFFIXED, THEN ONLY THREE SIDES NEED BE DUG OUT.

It is difficult to find the exact point of CG when checking for balance at the workbench or field. John B. French of West Hartford, Connecticut, finds it easy to pick up the reference point by inserting a thumb tack at the CG under the wing on each side of the fuselage. This makes it easy to feel the right point to support the plane with fingertips and get the exact balance.



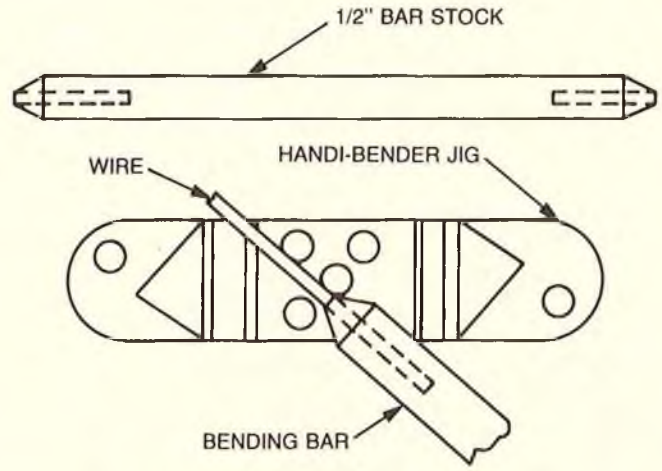
The throttle control on a big model presented a problem to Andrew Nelson of Chevy Chase, Maryland. Here is the way he solved the problem as per the sketch. In building a 1/4 Scale J-3, he needed a simple, but trouble-free servo to throttle hook-up. The servo was mounted on the bottom of the fuselage and the throttle arm was toward the top of the firewall. He used a 1/2A steerable nose wheel assembly to do the job, rather than bending wires or using flex-cable. The advantage is that the system does not bind, and the throw is easily adjustable and even reversible.

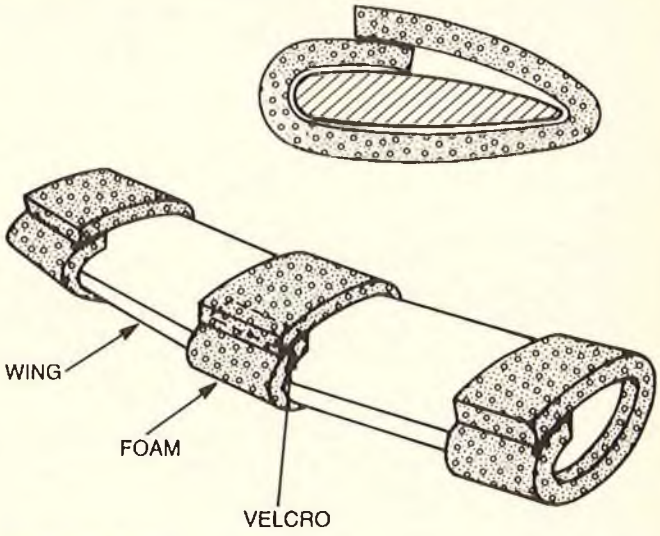
Mac McKeller of Saginaw, Michigan, has been bugged by all the dust and lint on the canopies of new kits. The more the canopy is handled, the bigger the problem. He simply liberated a sheet of Bounce from his wife's laundry dryer, wiped the canopy inside and out, and presto — no more static --- electricity, that is, his wife didn't catch him.

Here is a nice idea from George Blum, Pittsburgh, Pennsylvania. George writes, a fine low cost protective covering for glider wings when transporting and storing them can be found in your auto supply department. Open weave polishing cloths in double thickness form a tunnel effect that allows wings up to 8' to be slipped into and fully covered both protecting from dings and dust while storing. After you "cream" the glider they can then be used to polish the car.

To tint goggles for Williams Bros. pilots, mix one drop of food coloring and a small amount of R/C-56 glue, and coat inside of goggles. When dry it is transparent. This idea was sent in by Harry T. Haught of Bridgeport, W. Virginia.

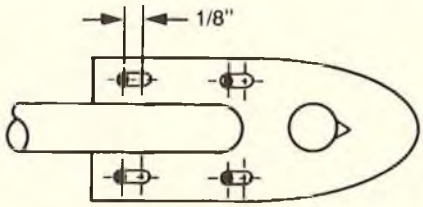
FOR WHAT IT'S WORTH



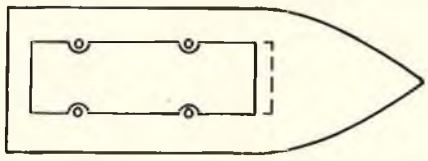


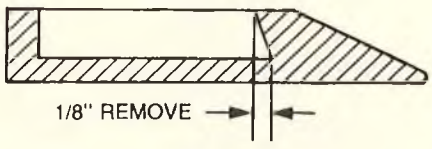
Charles Brown, Detroit, Michigan, submitted the following idea for bending 5/32" and 3/16" piano wire. Cut a piece of 1/2" bar stock approximately 10" long. Bore a #21 hole in one end and a #12 hole in the other end, approximately 4" deep. Grind both ends of the bar to a conical shape. When bending wire, insert the wire into the hole of the bar stock and place the bar as close to the fulcrum pin of the handi-bender jig as possible. The accompanying sketch shows how it looks.

Hobbyists who have the older type Sealector Heat Sealing Iron and would like to have the "new improved shape" of the Top Flite Sealing Iron, may do so without having to purchase a new iron. A Top Flite Iron Replacement Shoe can be bought and modified very easily to fit the Sealector Iron. First, the old shoe is removed by taking out the four small screws on top. The shoe is now removed, taking care not to damage the gasket in-between the shoe and the top. Also, do not forget the piece of insulating material in the bottom of the shoe cavity. The cavity in the new shoe is a bit too short to allow the Sealector heating element to fit in. This can be easily taken care of with a rotary file in your Dremel tool. About 1/8 of an inch needs to come out of the lower end of the cavity towards the pointed end of the shoe. This can be done in about two minutes. The only other alteration required is either slotting or drilling new holes for the four small screws mentioned above as shown in the sketch. This helpful hint was submitted by Richard L. Shirey, Sewickley, Pennsylvania.



SEALECTOR TOP
WITH HEATING ELEMENT





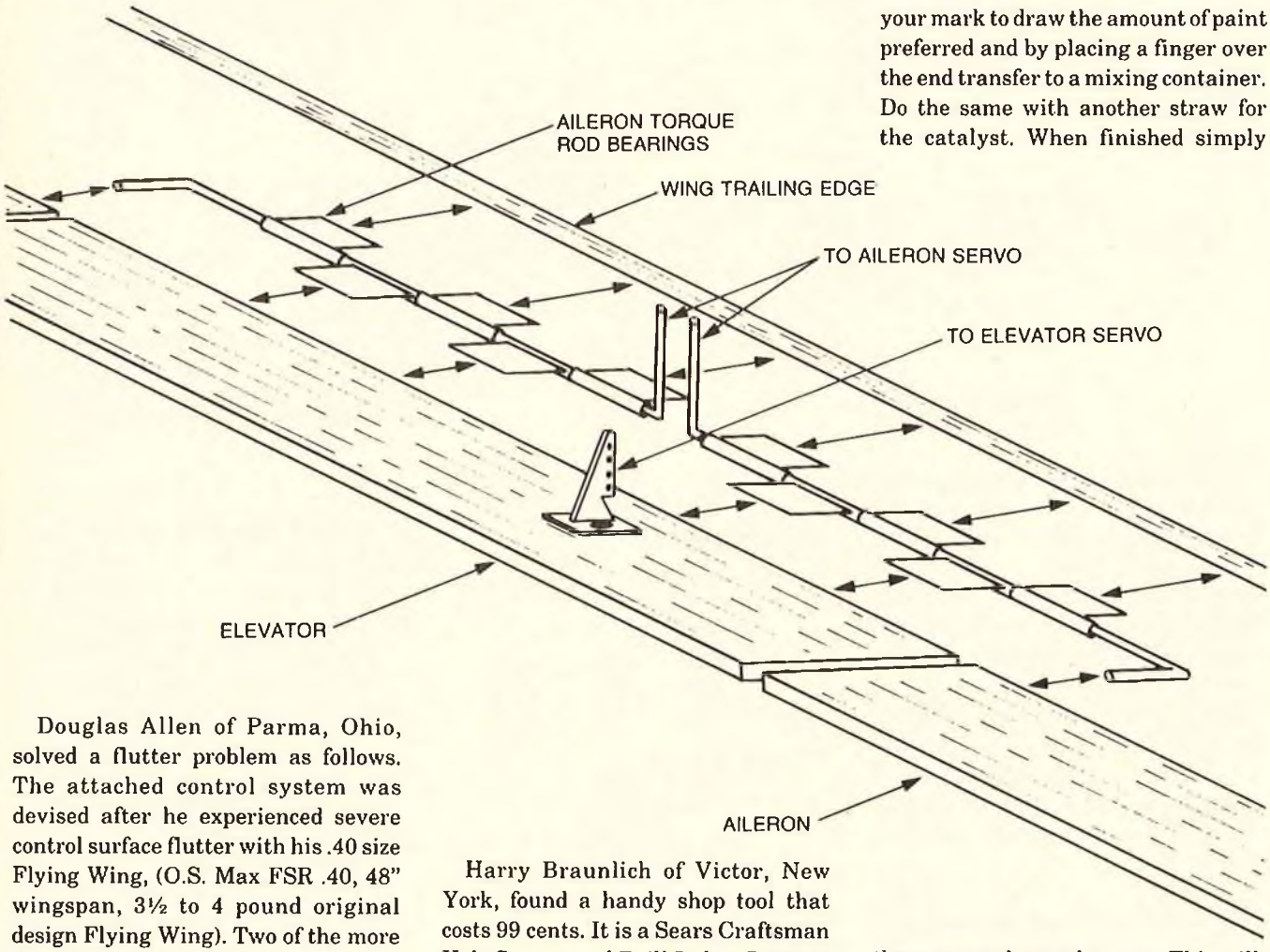
TOP FLITE
REPLACEMENT SHOE

A sticky problem was solved by Nigel Jones of Port Coquitlam, B.C., Canada. Prior to painting any area such as tank compartment or firewall area with resin for fuelproofing, paint any epoxy glue areas first with white glue such as Elmers. This will form a barrier, allow the resin to cure over the epoxy and eliminate those "sticky" spots after curing.

Ralph Keays from Garden Grove, California, tells how he made a damage proof wing transporter for $1.70. He bought a piece of 1" thick foam rubber 24" x 36" from Standard Brands Paint Co., and a 36" strip of Velcro (hook and pile) from a yardage store for $1.00. He cut the foam into 3 pieces, 12" wide, wraping one around the middle of the wing (overlap and mark). Then with contact cement, glue the hook to one side and the pile to the other. Do the same for the ends, but be sure to extend out from the tips. For more detail, see sketches. He did this almost 2 years ago and it worked so well, he did it to all of his wings and even stacked them on each other in the back of his pick-up. Try it, it's quick to put on and quick to take off. Ralph has never had a ding or scrape using this wing transporter.

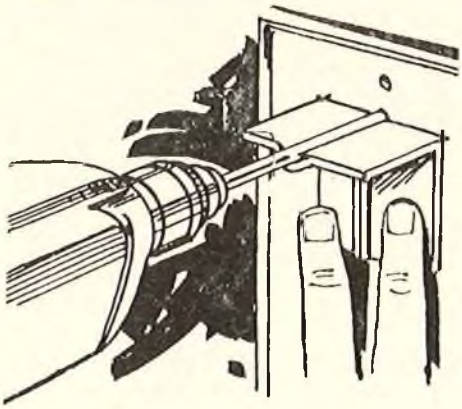
Does the sheet balsa split when you try to bend it around a part of your model? J. Wine, Huntington Beach, California, tells how he solved this problem. While planking the fuselage of a Top Flite Bearcat with its compound curves, he found that a convenient method of softening balsa wood is with a spray bottle of Windex. Windex contains ammonia which enables easy bending of balsa without splitting. Just spray the wood liberally and let soak a minute, now it will be soft and pliable. There is no residue after it dries, and the spray bottle eliminates any mess.

FOR WHAT IT'S WORTH



Douglas Allen of Parma, Ohio, solved a flutter problem as follows. The attached control system was devised after he experienced severe control surface flutter with his .40 size Flying Wing, (O.S. Max FSR .40, 48" wingspan, 3½ to 4 pound original design Flying Wing). Two of the more popular mechanical mixers proved to have too much slop to handle the speed and high "G" turns of the aircraft and he felt he would have much the same problem with a three surface bellcrank type set-up for the ailerons. In this system, as shown in the sketch, the elevator is simply hinged on the 3/32 aileron torque wire using standard aileron torque rod bearings. The ailerons are controlled by the torque rods while the elevator is operated through a standard surface mounted control horn. The number of torque rod bearings used will be dictated by the width of the elevator. To keep the installation solid, the bearings closest to the bends in each end of the wire should be anchored in the trailing edge of the wing. This system provides a very solid, easy to adjust set-up and would work equally as well for a flap/aileron set-up on a standard aircraft.

Harry Braunlich of Victor, New York, found a handy shop tool that costs 99 cents. It is a Sears Craftsman Hole Square and Drill Index, Part #9 2596. It can be used with drills from 1/16" to 1/4" and guides the drill 90° to the surface. See sketch. A real bargain for a useful tool in today's economy.



When mixing two-part paints for small touch-up work it is very easy to utilize a common soda straw for measuring. Just mark the straws in whatever graduations you prefer. Next, dip one straw into the liquid to your mark to draw the amount of paint preferred and by placing a finger over the end transfer to a mixing container. Do the same with another straw for the catalyst. When finished simply throw away the used straws. This will result in exact equal parts being mixed with little or no paint wasted. **Do not** suck on the straw while picking up the liquids, the vapors are toxic. This idea was submitted by Wayne L. Boots, Waterloo, Iowa.

The following suggestion was sent in by Fred Beeson of Tampa, Florida. Fred states that nylon bolts and nuts available at hardware stores make excellent guides or supports for wire extensions for receiver switches and antenna lead outs. Pick the appropriate size and drill the required hole through the center of the bolt, drill the hole in the fuselage for the bolt and install.

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.

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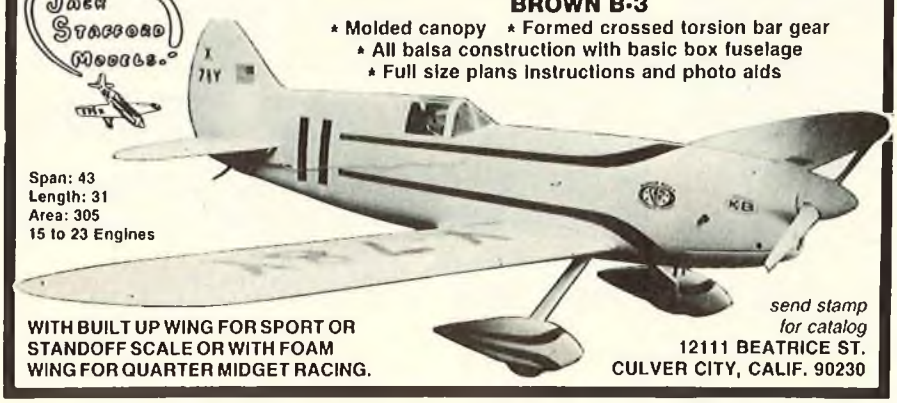

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from page 87

Heavy wing will lag behind. Add weight to wing tip and re-trim for level flight.

(b) Loop-tracking — if you trim a plane to do perfect inside loops, it will do perfect outside loops. Do several inside loops in both directions. Left to right and right to left (in front of you) without rudder or aileron correction. The plane will move in or out from you in the direction of the heavy wing. You may need engine thrust correction for torque problems.

After completion of Level I, you have a plane basically trimmed for pitch, roll, and also yaw axis (to a limited extent).

Flight Level II

(1) Roll rate — do three horizontal rolls in 4-5 seconds. Set fast roll rate for Top Hat and 1/2 rolling Figure M (approximately one second per roll).

(2) Reasoning for aileron differential: during the first quarter roll, down aileron causes more drag and plane yaws in that direction.

(a) Flight test — climb 45° then roll 180°. Does the heading change?

*Roll Right heading veered to right = too much differential.

*Roll Left heading veered to left = too much differential.

(3) Check aileron position by pulling up vertically and then neutralizing controls. Does it pitch forward or backward? Raise or lower both ailerons as needed for correction. You will need to re-trim elevators slightly.

You are now ready for flight Level III which is a finer adjustment of fore and aft balance.

Flight Level III

(1) Increase rudder throw so plane will stall turn equally well in both directions.

(2) Point rolls are better if the Center of Gravity is moved back. It requires less control deflection on rudder and elevator.

(3) Move the Center of Gravity backward until stall turns are less predictable, then move Center of Gravity forward to achieve reliable stall turns.

With completion of Level III you have achieved 90% trim perfection without using any rudder correction. Yaw correction has been achieved by fine trimming the roll and pitch axis. You are now ready for flight Level IV, which is a refinement of knife edge flight. Go slow with these corrections.

Flight Level IV

(1) If in knife edge flight, there is a tendency to pull to the top of the aircraft.

(a) correct by cranking up in both ailerons or,

(b) shift the Center of Gravity back and re-trim elevator.

(2) The reverse is true for a tendency to pull to the bottom of the aircraft in flight.

Congratulations. If you have achieved Level IV, you and your aircraft should be ready for some serious competition. A

to page 112

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HOW TO FLIGHT TRIM

from page 110/87

special thanks to the following individuals whose ideas have been used in this article: Dick Hanson, C.W. Reed III, and James R. Kimbro, Jr. □

INSURANCE COVERAGE

from page 77/76

(flying someone else's airplane). There is no negligence or fault implied when this coverage pays. Basically it is for your moral (not legal) obligation. However, the same definitional problem occurs. Payment will not be made for "(3) the ownership, maintenance, or use of a motor vehicle, aircraft or watercraft."

In summary, to provide coverage in your homeowners insurance contract, you must ask your insurance agent to request the company to commit itself to the following in writing (assuming no business activities):

(1) **Personal Property Coverage** -- The exclusion "aircraft and parts" does not include models under X pounds, Y wingspan and Z total engine displacement and their accessories (including radio control transmitters, receivers and parts).

(2) **Personal Liability and Medical Payments** -- The aircraft exclusion ("an aircraft") does not include models under X pounds, Y wingspan and Z total engine displacement.

(3) **Damage to Property of Others** -- "Aircraft" does not include . . . (same as above).

(4) If you have excess coverage (umbrella) over your homeowners make sure that the definition changes also conform to that contract.

In the above changes, it is better if you are not restricted to size, weight and displacement characteristics, but,

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Engine .19 - .40 - .55 Channels: 3 - 4
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QUICKIE 200
Wingspan: 35 In. Area: 214 sq. In.
Engine: .049 - .051 Channels: 2 - 3
Materials: Wood fuselage, foam wing
This is a fast and stable half A design. It uses an easy to finish wood fuselage and foam wing. It can be totally ready to fly in less than one day.

QUICKIE SPORT
Wingspan: 50 In. Area: 500 sq. In.
Engine: .29 - .40 - .55 Channels: 3 - 4
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Materials: Plywood, foam, balsa.
A tunnel hull which uses the latest technique in modeling for lightweight and high strength construction. Plywood formers, ply covering, molded sponsons, and canopy are included.

INSURANCE COVERAGE

from page 112/76

the underwriters may not accept the definition changes otherwise. You can also request similar changes for watercraft, as well as automobiles.

Watercraft:

Your models and accessories should not be subject to the $500 limitation.

Motor Vehicles:

(1) Models should not be considered "motorized land vehicles." (Property coverage.)

(2) For Liability, Medical Expense and Damage to Property of Others:

Models should not be considered a "motor vehicle." (Recreational use of unlicensed motor vehicles off the premises is not covered.)

In conclusion, even though you think you have enough insurance coverage with the AMA, you may not. Since you are already paying for your homeowners contract, you should be able to find out in writing what coverage you have. If the contract then does not conform, you should request the changes. Your insurance company may not decide as fast as you would like, so be patient and understanding. One last comment: Insurance is designed to pay for your large catastrophic losses -- ones you cannot financially handle -- don't abuse it.□

THULIN TYPE "K"

from page 75

.... furnished for the rigging, 1/64" three-ply plywood is furnished for the front of the fuselage and tail assembly covering. All parts for the construction are supplied except for the covering material, engine, and R/C gear. The plan shows stabilizer and ailerons optional. We built the original wing-warping version.

Construction:

The Thulin has two plan sheets, 32" x 54" with four 9" x 15" pages of instructions. There are no construction photographs, but there is a photograph of a full size original Thulin.

Construction of this aircraft is a big change from the slab-sided, fast building airplanes. We had a little difficulty identifying the parts because very little is prefabricated and must be built-up from materials supplied in the kit. The quality of the

to page 118

REGAIN CONTROL

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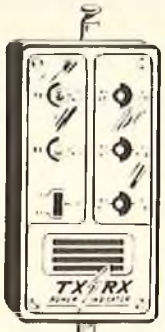

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THULIN TYPE "K"

from page 116/75

wood is good and die-cutting and machine cut parts are excellent.

The fuselage is constructed with two identical built-up sides using 1/4" x 1/4" spruce. We found the spruce hard to bend and had to soak and warp them before assembly. Once the sides were completed and assembled together, 3/32" square cross bracing and gussets were installed. All the gussets had to be cut from 1/16" plywood. The plans show a scale instrument panel, but the kit does not include materials to build one. This kit is scale so we decided to build the instruments from plastic and give the ship a little more class.

There are four different sizes of spring steel wire used in the landing gear assembly. All four wires must be bent to shape (instructions on plans). After the landing gear has been shaped, we used the hardwood supports in the fuselage for support when soldering the wires together and when adding the wood fairings. The fairings are made of hardwood and are notched to fit on the wire, but must be carved to an airfoil shape.

The tail skid support is assembled from brass tubing (supplied with the kit). These tubes must be bent and shaped per the plans and are then held together with bolts and nuts with some soldering. The skid itself is made up by laminating three pieces of pine together. We added a piece of wire to the bottom of the skid to protect it when flying off asphalt.

The engine cowl is made from an aluminum pot (supplied with the kit). The front of the cowl had to be removed and we found that a Dremel jig saw worked well if we were very careful. After finding the front of the cowl, we marked the cutout lines and removed the unwanted section with the Dremel saw. Next we added a brass strip to the back side of the cowling, using aluminum rivets (strip and rivets supplied with kit). After drilling and riveting the brass strip in place, the cowl is attached to the fuselage with four screws, and is very easy to get on and off for access to the engine. The engine compartment is large enough for almost any size engine. The plans call for a .40 to .60 size engine, so we installed a HB-50 with a 10 oz. Sullivan Tank, and a Pitts Special Muffler. We used an aluminum engine mount and made a dummy engine to fit over our HB-50. The dummy engine was made from scrap plywood and the cardboard tubes from the covering material.

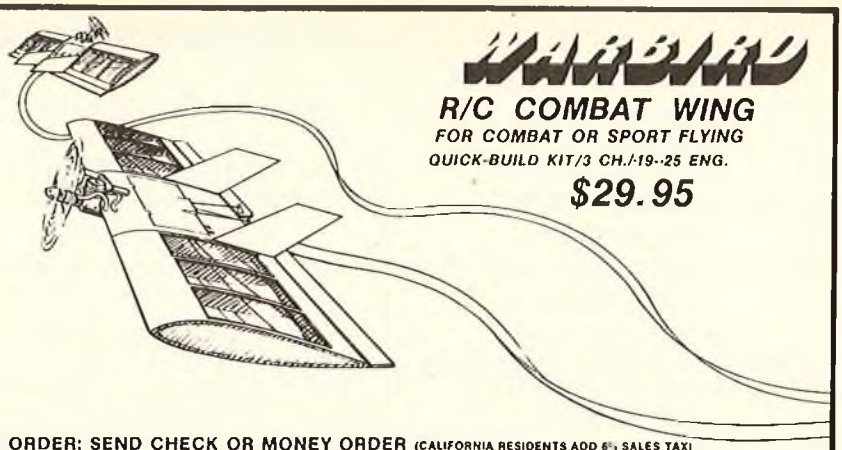
Construction for the dummy engine is shown on the plans. By removing the cowl, there is excellent access to the engine without removing the dummy engine.

The wing ribs are die-cut 3/32" balsa with a plywood root rib; spars are 1/2" x 1/2" square hard pine. The trailing edge is 1/8" x 1/4" rough shaped hard pine, and the leading edge is 1/2" x 1/2" square hard pine. Diagonal cross bracing is 3/16" x 5/16" balsa, wing tips are 1/4" aluminum tubing. We found the aluminum tubing easy to bend and shape as long as we did it right the first time — rebending is much more difficult as the aluminum tends to work harden. The wings are attached to the fuselage much in the same manner as sailplane wings, with brass tubing and music wire, and are held in place with the rigging.

Rudder and elevators are both built in the same manner. The leading, tip, and trailing edges are machine cut from 1/4" balsa and the fit is good. These assemblies are fabricated in the standard way until it comes to the covering material.

The covering material on the rudder and elevators is 1/64" plywood. We followed the kit's instructions on fabrication and found it to be rather easy. Each unit was built first, then sanded one side to airfoil shape. Next we added the skin to the completed sides, then turned them over and sanded the other side to shape, and added the other skin to complete the unit. This type of construction looks heavy, but is really rather light.

To facilitate fast assembly at the field and easy transportation, a modified type of turnbuckle has been used. This is not to scale and the "dyed in the wool" modeler can use regular or Proctor brass turnbuckles if he wants to. We used the modified version with parts supplied in the kit. Parts included were 3/32" threaded bar, lugs, nuts, and metal Kwik-Links. We found these to be satisfactory but, no matter what is used, there are 16 turnbuckles to be taken off and on every time the Thulin is disassembled for transportation. This takes time and each one has to be checked again for alignment, and this is no easy task with a wing-warper. Rudder and elevator rigging cables are shown on the plans and present no problems if the tension is properly set. The servos must work freely, but there should be no slop in the movements. Rudder throw is 5/8" each side. Elevator throw at the trailing edge is 3/4" up and down. The wing rigging is a little more difficult. The dihedral is approximately 13/16" at the tips, and should have about 3/4" washout. The wings should be able to warp up and



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down at the tip 13/16". The turnbuckles make this adjustment easy to achieve.

Covering:

The instructions call for "Antic Coverite" which needs no additional finish and leaves the wings bendable, reducing the load on the warping servo. We covered the fuselage and wings with Antic Coverite and put on a thin coat of polyurethane for insurance against fuel creep; this did not add much load on the warping servo. The wood parts all got a walnut stain and a polyurethane coat for a medium gloss.

Radio:

A four-channel Futaba Radio was used with S-26 servos and a S-7 waterproof servo for the warping servo. We found it easier to install the radio during construction of the fuselage — the plans show the location of servos but it is left up to the builder how to get them in and out if necessary for maintenance. We put a hatch in the bottom of the fuselage and turned two of the servos over for accessibility. The elevator servo operates the joy stick in the cockpit as well as the elevator, and the wing warping servo fits nicely under the seat, and is easy to get to.

Flying:

We did not want to try to outguess the designer on this wing-warper, so we set the throws and the C.G. as recommended on the plans and instructions. The first test flight was with a 12/4 prop and we found that, like most taildraggers, the Thulin has a left turn tendency. Very quickly it stabilized and within feet it was airborne, and climbing at a steep angle. We over-reacted and brought the nose down too fast and it hit the ground hard, tearing up only the landing gear. The Thulin is surprisingly strong, and the next weekend we had it back to the flying field. This time we used a 12/5 prop with a little more down trim, and it lifted off almost by itself. It flies slow and is a little mushy on the controls at first, and we found that to make a turn the wing warping and rudder must be used together. The HB-50 is more than ample to fly this aircraft.

Conclusion:

The building and flying of this model is hardly for a newcomer, and we feel the kits need a little more pre-fabrication of the metal parts. This model would be a good project for an experienced builder who likes a lot of detail and has a lot of time. When complete, this model is very rewarding to look at on the ground as well as in the air. □

R/C SAILPLANE DESIGN

from page 74/72

shop.

7. If your flying surfaces have any bends or twists that you didn't put there deliberately, take them out.

8. Take the necessary time to do a neat radio and control linkage installation. Control surfaces should move smoothly and positively. If the surfaces are "springy" find out why and fix it.

9. If you don't own a "quality" radio, get one.

10. Be objective when evaluating your new creation. Your forty-minute first flight has little meaning if the tree stump in that same thermal did thirty minutes.

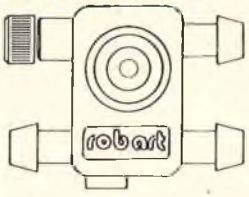
11. Don't try to re-invent the airplane. A good idea is a good idea no matter where it came from. If you think of a better way to do it, great, but don't compromise your design by refusing to use something because someone else thought of it first.

12. Keep in mind your initial design objectives. These are the ones to use for evaluation. You should expect an F3B type sailplane to have a greater sink rate than a pure floater. By the

to page 124

FUEL SYSTEMS

AUTO MIX 2



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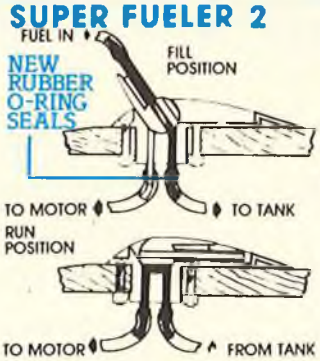

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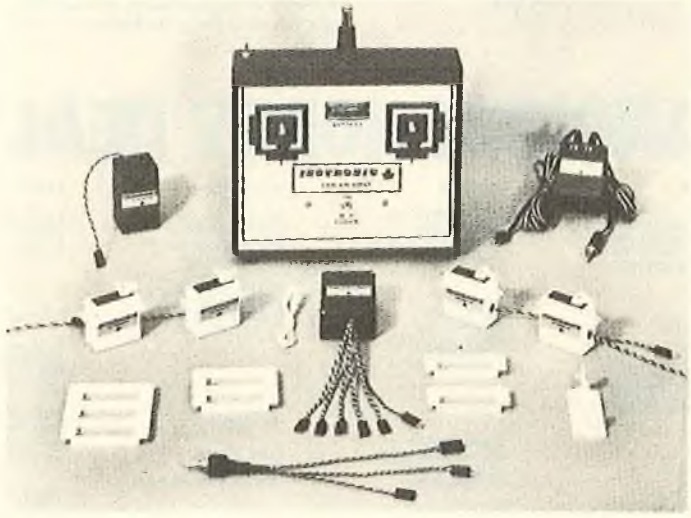

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R/C SAILPLANE DESIGN

from page 120/72

same token, it had better out-penetrate the floater.

13. Just about every sailplane used by contest fliers today is a good one. There are some differences, of course, but these differences do not determine the winners. The people who win consistently are the better fliers. So, even if you could create a machine that is better than the competition's machines, it won't do you any good if you can't fly as well as they do --- and they are all excellent fliers! The point here is that it is not possible to get the most out of a sailplane unless you, the flier, are capable of doing so.

Perhaps what is needed now is an article on the "Design and Development of the R/C Sailplane Flier." Finally, please remember that this is a wonderful sport/hobby that we are involved in and is supposed to be fun. You should make your own decisions about which aspects of the hobby give you the most satisfaction. If this article, or any part of the article, has been of any value to you, then it has served its purpose. □

FREQUENCY COMMITTEE STATUS REPORT

from page 71

encouraged to begin development work on narrow band R/C receivers. Such receivers will greatly enhance use of the new 50 plus 23 channels. Manufacturers should also consider the need for receiver design that would utilize an "odd" I.F. frequency (such as 1.6 MHz) or have dual conversion. You must consider these

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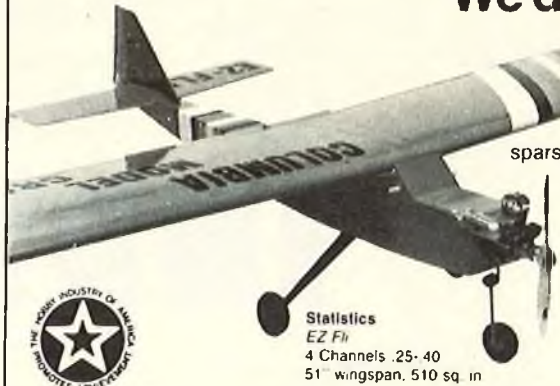

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The Midwest kit contains a thoroughly illustrated guide to building and finishing the model. Two paint schemes are shown — the factory J-3 version and a military version.

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options in your design work since image and intermodulation (I.M.) problems will arise when attempting to use a full 1.0 MHz band (72.0 to 73.0 MHz aircraft use) with the existing 455 KHz I.F. receivers. The R/C industry should also prepare to make the necessary frequency changes to get the modelers on the new channels, using existing equipment, as soon as possible after the FCC Report and Order takes effect.

Future Plans

Dr. Walter Good reports that the AMA's 900 MHz experimental R/C equipment, ordered from the REFTEC Company of Mildenhall, England, is nearing completion. The transmitters are already working, providing 250 milliwatts RF power output. The receivers are complete except for the special crystals. As soon as these crystals are received the equipment will be shipped to the AMA. Committee members, Dr. Walt Good and Dick Jansson will then proceed with a flight test program. It is hoped that some initial test data will be available by the first quarter of 1982. Should 900 MHz prove feasible for R/C purposes, it will open some new doors for future exclusive channels. The FCC is encouraged by our efforts in this area. □

PIT STOP

from page 70/68

"A" Main with Bob Hayes in 2nd and Bob Schatz 3rd, making Schatz a consistent 2nd in Stock and 3rd in Modified.

Amateur Modified "A" Main

1. Mike Westfall
2. Bob Hayes
3. Bob Schatz
4. Mike Howe
5. Robert Fujioka
6. Larry Krogh
7. Russ Aguirre
8. Greg Borella

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The Radio Shack Part No. is 276-081 LED Bar Graph Display. Its leads should be bent straight out, ten to the left and ten to the right. Also be careful that the leads #1 through #10 connect to the common positive copper strip on the circuit board, while leads #11 through #20 connect to the voltmeter chip leads. Just bend out the leads, lay it on the circuit board and solder it in place.

Only the best pass the President's Physical Fitness Test. Can you? Find out. If you're between 10 and 17, ask your teacher or write Fitness, Washington, D.C. 20201.

9. Gary Slayton
10. Chris Chan

Expert Modified Class

Rich Douglas must be able to see in the dark, because the "B" Main was run under the lights and he won again. It wasn't easy because Joel Mayer was close behind in 2nd with Tim Neja 3rd.

Expert Modified "B" Main

1. Rich Douglas
2. Joel Mayer
3. Tim Neja
4. Ken Stephenson
5. Bruce Hickman
6. Curtis Husting
7. Mike Kimrey
8. Randy Tentschert
9. Larry Stevens
10. Kent Clausen

The big one was next. The Expert Modified "A" Main. Mike Lavacot was Top Qualifier and had to be the favorite going in, but the Top Qualifier doesn't always win. When you get 10 drivers who have qualified within a very few short seconds of one another, the starts of the races are very critical. This race was actually run before the "B" Main, so it was run during daylight, which really helped the blind like me.

Frank Killam got the early lead, with Mike Toland about 20 feet back in 2nd. Lavacot got caught in traffic, but he was now working his way up. Killam continued to lead; he is a super driver and doesn't make many mistakes, and right now he wasn't making any mistakes. If somebody was going to beat him they would have to drive around him. He wasn't going to beat himself.

It took Lavacot about 6 minutes to catch Toland. Toland moved over and let Lavacot by. Lavacot was now closing on Killam, but he hit a dot losing time. He again got close to Killam but again hit a dot. With 2 laps to go Killam and Lavacot's batteries started to go, but Toland was still going quite good. Toland started to close in on Lavacot and got within a few feet of him. Lavacot meanwhile was also closing in on Killam just as they crossed the line for the checkered flag! It was a very exciting finish and a great win for a great driver — Frank Killam. And a lot of other drivers qualified for the World's Championships.

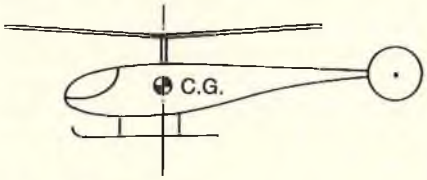
Expert Modified "A" Main

Place & Name	Car	Motor
1. Frank Killam	Leisure	Checkpoint
2. Mike Lavacot —	Assoc.	Reedy
3. Mike Toland	Assoc.	Reedy
4. Rich Lee	Assoc.	Reedy
5. Roger Curtis	Assoc.	Reedy
6. Gene Husting	Assoc.	Reedy
7. Jim Aguirre	Assoc.	Reedy
8. Jerry Case	Assoc.	Reedy
9. Doug Kott	MRP	MRP
10. Mike Wibben	Assoc.	Reedy

□

from page 67/66

helicopter is extremely important. It seems that many beginners don't really believe or understand this and often try to learn to fly on a helicopter with an incorrect C.G. position. This can make a helicopter very hard to fly. Adjust the C.G. to be in the proper position, usually dead on the main rotor shaft, and your R/C heli will turn from a "bear" into a "lamb." It will also make learning much easier.



Check Your Paddles

Make sure your "Hiller" paddles on your flybar are tight, in line with each other, and that both of them are parallel to the swashplate. In this respect, also check that the flybar control arm is fixed tightly onto the flybar itself. Be sure that **both** paddles have their leading (blunt) edge facing the direction of rotation. (How many of you have flown with one or even both paddles facing the wrong way? I know I have.)

Check Your Tail

Check your tail rotor drive every now and then and this will avoid a tail rotor failure in the air which, though wonderous to behold, can also cause a lot of damage after contact with the ground. To do this check, hold the rotor head in one hand and gently but firmly try to turn the tail rotor blade assembly with the other. You'll soon learn to test if there is a potential slippage there or not.

Hovering and the Wind

Always be sure, when you start to practice your hovering, that the nose of the helicopter is pointed into the wind. It is very hard to hover cross wind or downwind, even for an expert, and certainly makes learning much more difficult for the beginner. Don't forget, too, that the wind can change on you while you are concentrating on your practice. (Remember the times when control seemed to be getting weird and then you found that the wind had done a '180' on you?)

Keep Your Radio Charged

Be sure that your radio transmitter and receivers are well-charged before you commence your practice. Do not practice if you have any doubt about their condition. And don't forget, when you are practicing hovering, you lose track of time and you can easily run the batteries down because you have been practicing for an hour or two. In this regard, don't forget, when

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Futaba FP-3FN/S22	199.95	124.00	2	yes
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Airtronics 9160-6XL431	329.95	214.00	4	yes
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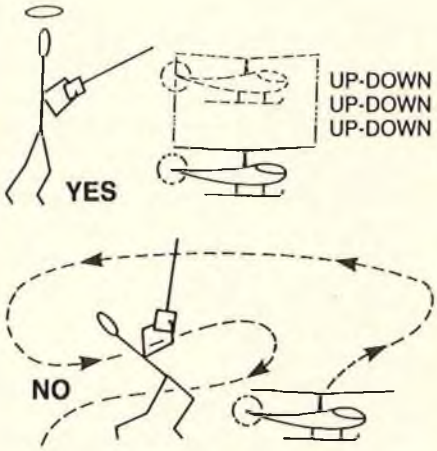
the batteries are down, you'll stand a great chance of losing control over your chopper. Then . . . well, don't let it happen to you.

Hover Discipline

When learning to hover it is far better to try to achieve frequent, short hops in one place than longer "uncontrolled" flights into the wild blue yonder. It is essential, if you wish to become a smooth and accurate flier, that you decide from the very beginning that **you** must control the **helicopter** and not just follow it around the sky. And do have faith that, if you do continue, many, many short practice hovers for a few seconds at a time, it won't be long before you can hover out full tanks in front of you almost motionless in the air — that's the day!



Well, that's it folks for this month. Hope that your Christmas helicopters are flying well and maybe one of the hints and tips above will help you to learn just a bit faster. □

ASSEMBLY OF THE EAGLES

from page 65/59

indicates that the judging is being done rather subjectively. That may not be a bad thing as the judges are also doing the flying and it means they **know**, very well, what it takes to fly under the conditions that exist. They are also builders whose knowledge permits them to judge the degree of difficulty of a project and which probably reflects, as well as any method, the overall effect of a particular model. There is no prescribed program to be flown, it really is a fun fly and no pressure is put on anyone to fly if they don't wish to. This year for the first time, non-flying models were not eligible for any trophies other than a new one, specifically for static diplay models.

Many Scale Rallies do not even provide trophies, only an arena for

people to get together and fun fly. In the case of Las Vegas, being the prestigious event it is and with a world wide following, the trophies provide a momento of the event for many of those who participate.

The Static Trophy winner was Dick Enos with a very well-done Lockheed Vega in Winnie Mae colors. Dick's reputation as a fine builder is borne out once again in the Vega, and it is big. The Vega wasn't flown, so there isn't much else to say about it, except that it was beautifully done. The finish was superb and the airplane looked as if it had just been run out of the paint shop and, when flown, will be a most impressive sight in the air.

I have attended all but the first of the Las Vegas QSAA Rallies and if there is anything about them that stands out above all the rest, it is the friendly atmosphere and the relaxed flying in such a non-competitive event. I hear that's the case all over the country where guys get together to fly for fun, and I know that has been my experience. Modelers are pretty great people and it has been a very great privilege to meet and talk to so many of you. You have shared your good ideas with me (and everyone else who reads this column) and added a great deal to my enjoyment of modeling.

See you next month when we'll talk about building wings for the Biggies, and other good things. □

CHALLENGER

from page 56

pushrods did not accept standard 2-56 threaded hardware. We found it was necessary to purchase four 'L' hooks, similar to the one used for the tow hook. The wood screw threads fit securely in the ends of the inner pushrod. With pliers, the 'L' is straightened out and they are used with Du-Bro E-Z connectors or Goldberg pushrod connectors at the servo end. Where standard threads are absolutely necessary, the 'L' hook is connected to standard threaded stock with a split sleeve coupling and soldered securely.

Another engineering feature we liked is the method in which the tow hook anchor is inserted as an integral part of the bottom and then fastens securely into notches in two formers; there is strength here. The compartment just above the tow hook is a well-designed ballast box.

Covering:

The RCM prototype was all covered in Super MonoKote, even though painting was called out for the

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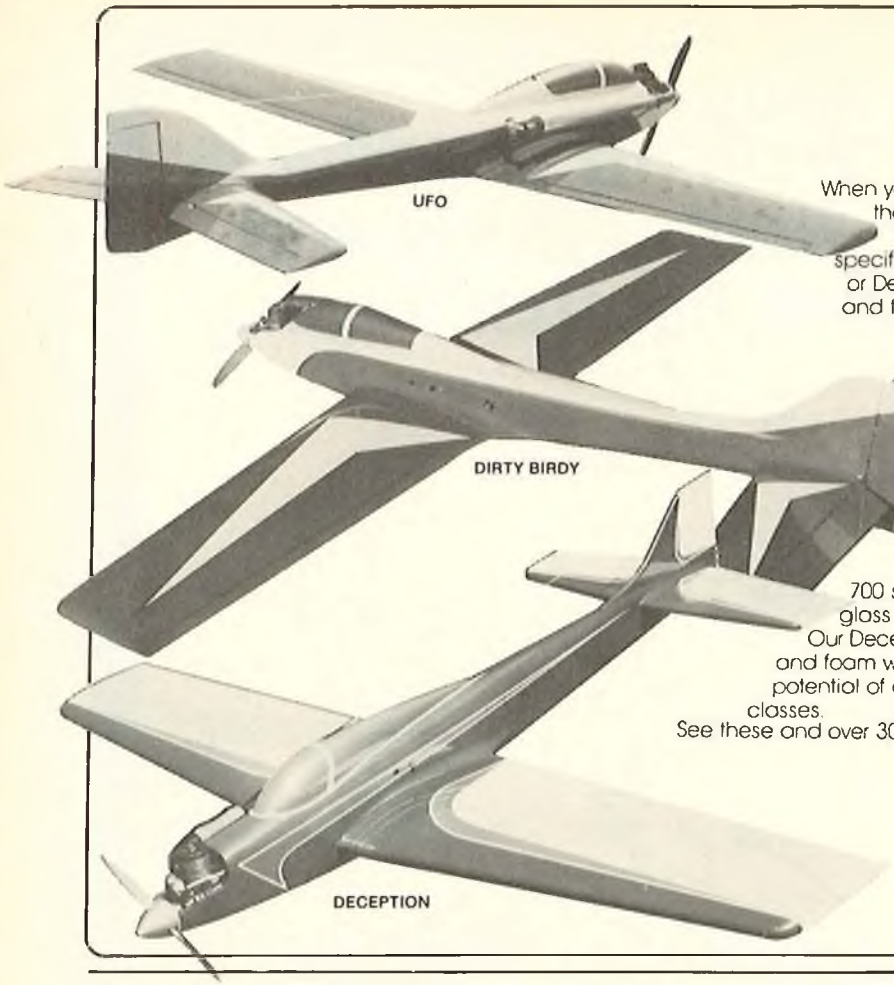

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fuselage. The little parts around the top of the fin will tax your ingenuity but it can be done and still look well. The RCM prototype had red and white wings using trim MonoKote for stripes and logo. The fuselage and fin were white, the rudder red.

Radio:

We used a Kraft radio with KPS 12 servos which were taped to the sides of the large radio compartment with servo tape.

Flying:

In order to get the Center of Gravity forward to its proper place, it was necessary to add three ounces of lead forward of the battery. We used a 500 mil battery pack with the case removed, the KPS 12 servos are fairly large by today's standards so, if you are planning to use smaller equipment and a 250 mil battery pack, we would suggest checking the C.G. carefully and adding weight in the nose block if necessary.

With the plane trimmed to the proper Center of Gravity, we threw the plane out of our backyard into the canyon behind. Instantly the lift took hold and before we could turn down the canyon the plane was 100' above our heads. At the upper end, the canyon curves in such a way that some of the return flight is into the wind. All we had to do was make our turn then crank in a bit of down elevator and she would tuck her tail and scoot. The designer is right, "When some of the other designs are just barely able to penetrate into the wind, you'll be flying pattern with your Challenger." Later tests at Torrey Pines proved everything said about this lady was correct — she is a real go-getter. She is really not a floater so when you find yourself in these circumstances, just give her head and she will zoom out and help you search out another boomer. If you are looking for a competition sailplane, this is it --- look no further. □

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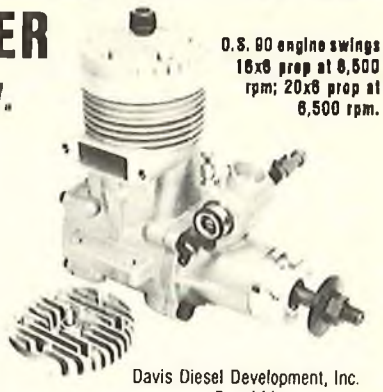

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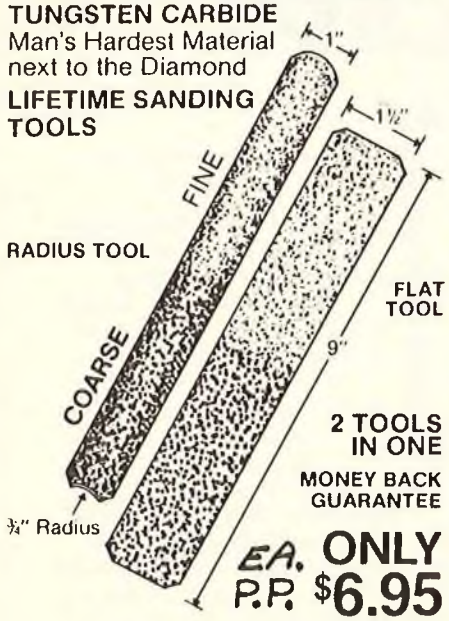

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from page 54/52

the local lake I purchased a Macs tuned pipe and exhaust header for the engine. The butterfly exhaust throttle is stock and its piece was milled flat to accept the exhaust header correctly.

The engine won't fire even though the plug and battery are new. I have tried many needle valve adjustments and the engine won't fire unless it is about five turns out and even this is not for sure. When the engine is started (which is few and far between tries) the engine revs way, way up even though the throttle is only 1/4 open. The engine then goes dead soon after and usually won't start again. The engine won't start at all at leaner setting and it runs like it is too lean on richer setting. I am thoroughly confused with this engine and the good water dates are running out. Please send me directions on where to set the needle valve and how to start the engine. I am relatively new to R/C boating but I have a K & B outboard engine which runs fine but the inboard won't run.

Thank you,
Chris Capaldi
Troy, Michigan

It sounds to me like you have a fuel feed problem, Chris. First check the fuel tank for leaks and obstructions of the vent and pickup tubes. If you use a flexible tubing in your fuel pickup tube, be sure that it doesn't have any cuts or holes in it. I have seen such damage work like a one way valve that keeps fuel from being drawn to the engine. If your fuel tank system checks out, you should check the motor for the source of the problem. At five turns out the engine should run very rich. Since it doesn't, there is probably something wrong with the venturi or spray bar. The spray bar should be positioned in the venturi so that the single hole "looks" straight into the crankshaft port. If the spray bar has rotated very much from this position, the engine won't run right. The K & B 3.5 inboard engine has a venturi whose length is such that it doesn't completely seal off the set screw holes. Be sure that you push the venturi down hard on the front case so that the O ring seals. You might also put a very small amount of Silicon Seal liquid rubber on the set screws so that when you tighten these the chance for leakage in this area is eliminated. If you still have problems,

to page 136

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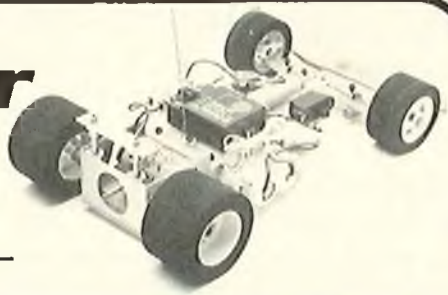

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POWER BOATING

from page 132/52

I suggest that you return the motor to K & B with a note describing your problems, because the only other thing that keeps a motor from drawing fuel is a leak somewhere in the crankcase. I am assuming that you have not taken the motor apart and reassembled it improperly. I am also assuming that you have mounted the fuel tank at the same level as the needle valve and that the fuel is not foaming from vibration.

Be very careful when you start the engine because it takes only a very small butterfly angle to achieve high revs in the unloaded condition of beach starting. The throttle position of 1/4 open is usually too far open and may lead to over-revving. Just barely crack the butterfly valve open and always be ready to close down the throttle when starting your engine. Before you start you should always check to be sure that the butterfly valve is in the proper position. You can scratch or file a mark on the butterfly shaft so that you can visually check its position without taking the pipe off. K & B has supplied a very good instruction sheet with each motor they make. Read and follow these instructions and you shouldn't have any trouble starting your motor.

Well, that about does it for this 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 stamped, self-addressed envelope so I may answer your letter by return mail. Howard Power, 766 Broadway, Seaside, California 93955. Phone (408) 394-1200. □

DEHAVILLAND CHIPMUNK

from page 51

. . . . The model proved to be very aerobatic. We did loops, spins, rolls, inverted flight, hammerheads, and even something that resembled knife-edge! That flat bottom wing eases the stall characteristics and makes landing a breeze. In the air the model is hard to fault. After five or six flights we found the motor mount had worked loose. Later examination revealed the nuts behind the firewall were the culprits. The firewall is assembled before it is epoxied in place. Getting to the nuts would require tearing out the fuel tank. Please MRC, switch to blind nuts!

Conclusion:

The MRC DeHavilland Chipmunk is a snazzy looking, snappy flying, ready to fly foamie. The $114.95 price tag isn't too bad when you consider the prefabrication involved and the quality engine included. If you're one of those busy people who would rather buy than build, this Chipmunk is going to be hard to resist! □

BIG IS BEAUTIFUL

from page 48/46

would bet that with the ingenuity of most modelers, it could be converted pretty readily to servo operation. I have found that in tightly cowled applications (where you can't get your finger over the carb to choke the engine properly) that it takes either a choke on the carb or a shot of prime (not always easy to administer) to permit easy starts. This little accessory looks like it would do the trick in such circumstances. Tatone also has a line of Kioritz and Kawasaki mufflers and a Kioritz mount which is interchangeable with the original mount on the engine.

Quarter Headquarters' line of Quadra accessories have been detailed here before, but an SASE to either of the firms mentioned will get you catalog sheets illustrating their products and detailing their prices for you. There line includes a Quadra throttle linkage to make that awkward 90 degree bend required to properly operate the Quadra throttle, along with a variety of mufflers for a wide range of mounting and exhaust requirements. Well-made as one would expect from a leader in providing for the needs of us big builders!

As this is written, the QSAA Rally in Las Vegas is still in the future, and as you read this it's in the past and done with. Part of the fun of being there is the anticipation of the event. Like a child awaiting Christmas, the anticipation is a big part of the festivities and, as the time approaches to leave home for Glitter city, my anticipation is building. That there will be many new faces, many new models and many new friends made is part of it. The pleasure of writing about it afterwards and the great recreational (after hours) attractions of Las Vegas make an ideal vacation. It's one of the few model meets you can take your non-modeler wife to and she has as good a time as you do. The lady who has looked after me for a good many years now has great difficulty arranging any enthusiasm for model airplanes. She has had to live with them now for so many years that I am sure there are times she wishes she

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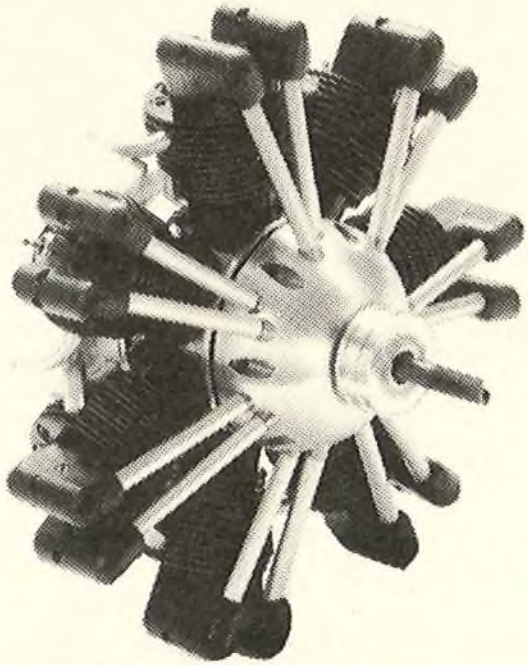

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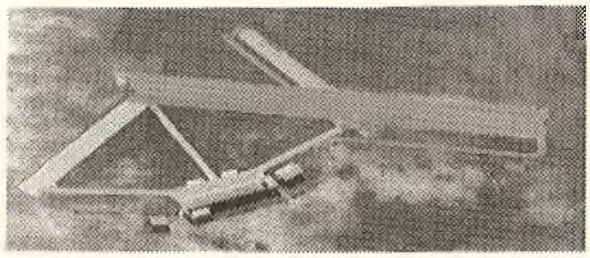

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would never hear about another one. Las Vegas is a whole new ball game, she doesn't have to hang around the field waiting to be taken back to the hotel, she doesn't have to sit around and listen to us re-fly everything that happened at the field and, in penance, she gets to eat out every night and to see some of the shows. I hope she never finds out that there are slots that accept amounts greater than a dime, I might have to re-think about having her go along with me!

Seriously, it makes for a great vacation, all the flying, hangar flying and models and modelers you can stand and a wife that doesn't want to go home after the first day! It's great.

Wendell Hostetler (1041 Heatherwood Lane, Orrville, Ohio 44667) will have his new offering in **big** on the market by the time you read this. The new bird is a bit of a departure for Wendell who currently has a Liberty Sport, a Skybolt, a Bucker, and a P6E in his stable. It's an 84" span model of the Art Chester Racer "Jeep." The new plan has been designed to fly on the Kioritz and I am guessing he uses the 2.44 c.i. version as it would certainly make a barn burner of a model at that size with that power out front. I have all of Wendell's plans and they are well-done and are all quite readily buildable, if there is such a word, and should not create any problem for the average modeler.

It would not surprise me if there were a few of you out there with the idea of pylon racing Quarter Scale models and the Jeep sounds like it could provide the impetus to get such a move started. The advent of the first Quarter Scale AT-6 will very likely add additional headway to such a movement. I hear there is a Texan coming from one of the model kit manufacturers and if their past efforts are any criterion, it too will be a good one. Can you see a Reno Air Races type model meet with several categories of

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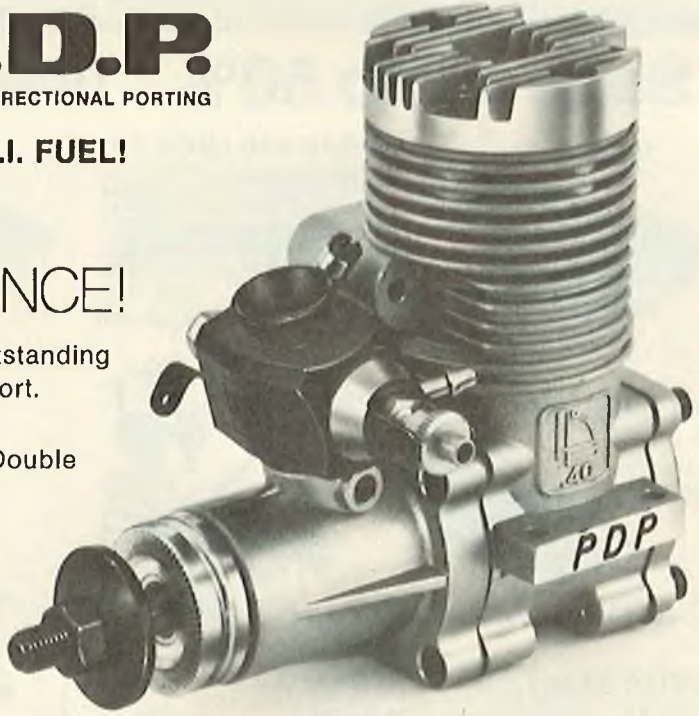

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pylon racing taking place over a two or three day meet? I can almost hear the sound of the starter, "Gentlemen, start your engines!" and hear the throaty roar of a half dozen Kawasaki's, Kioritz', and Quadras scattering for the pylon.

I know there is at least one Californian who has had this idea in his mind for a couple of years now and I will be surprised if it does not come to pass within the next couple of years as suitable plans and kits come on the market. Could it become the same spectacular event the QSAA Rally has become? I'd bet on it, if I were a betting man.

Think about that for a while, see you next month . . . Big Is Beautiful and getting better all the time! □

SOARER

from page 43/40

greater maneuverability --- also nice characteristics to have. Polyhedral is used to have as little lift loss as possible from the dihedral effect. It also enhances the ability to turn with rudder control.

The wing is set at a 4½ degree angle of incidence and is flown at this same angle, for two reasons. First, note that at this angle the forward 1/3 of the Davis airfoil is entering the air stream with a "symmetrical" shape. At this angle, this airfoil is in its lowest drag condition, offering exceptionally low drag for an undercambered style foil.

Secondly, a scientific investigation showed that a gliding model achieved its lowest rate of sink when the wing angle of attack was 5 degrees. With the wing incidence close to this angle, we are assured of being able to fly at this desirable angle of attack without excessive fuselage drag.

Additionally, this wing angle allows the remaining portion of the design

to page 144

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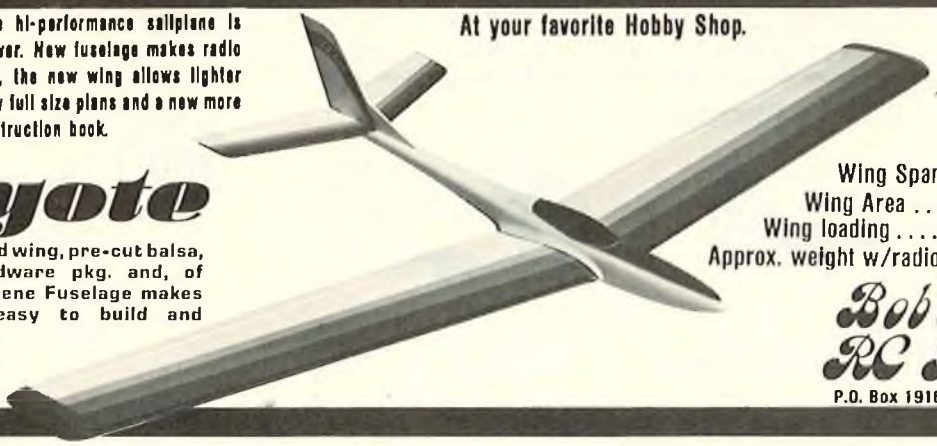

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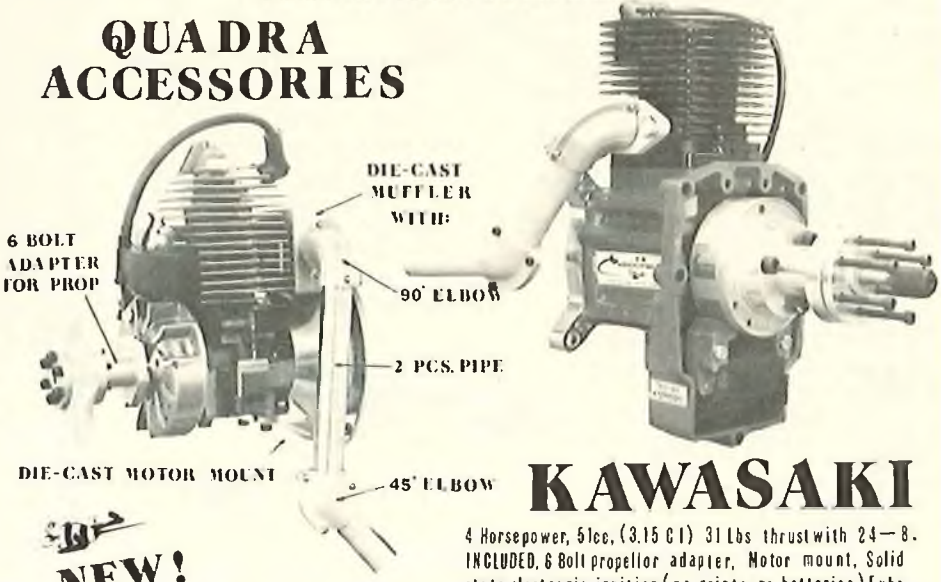

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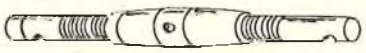


1/8" STEEL TURNBUCKLES

from page 139/40

concept to be practical, as you will see when the tail is discussed.

Structurally, the wing uses a progressive structure to achieve the needed strength. Note that the highly stressed center portion uses the reliable "D Tube," which progresses to common spruce spars and on to simple balsa in the lightly loaded tips. This is a serious attempt to achieve lightness plus strength. The spars are kept flush with the lower surface to facilitate attaching the covering.

Fuselage:

As always, the fuselage simply is a place to carry the equipment while creating the needed moment arms for stability. At the slow glider flying speeds, as far as drag is concerned, there is always the probability that "cleanliness" will do just as well as streamlining. Hence, in the interest of simplicity, the "clean lines" concept was used.

A fuselage structure which can use plywood for the sides immediately creates close to the ultimate in structural simplicity. The excess strength eliminates the need for additional parts such as doublers, reinforcements, and mounts. The lower weight of "Lite Ply" makes this concept most attractive.

Horizontal Tail:

If the rate of sink is controlled by the amount of lift available, then the greatest possible amount of lift seems advantageous. Lift is created by the airfoil, area and speed. If you desire a docile, easy to fly craft, you do not use speed which leaves only area and the airfoil to work with.

Fundamentally, the horizontal tail is required and used to create stability. The more tail, to a maximum amount, the more stability. An additional factor is that the tail can be used to generate lift as well as stability.

Tails of up to 1/3 of the wing area have proven usable. A practical amount has proven to be 25%. The choice here was 25% using a rather high lift airfoil. Perhaps something more could be gained by using a more precise airfoil, but simplicity and **lightness** dictated the use of the capstrip ribs.

For stability purposes, the balance point was established at 50% of the wing chord, even though setting it further back could take even greater advantage of the available tail lift.

The needed lift proportion between the wing and tail required a stabilizer

to page 147

from page 144/40

incidence angle of 2½ degrees. That makes a good lift angle for this type of airfoil. This also allows the glider to cruise nicely "up on the step" so to speak, reducing the chance of a stall when encountering sudden changes in air speed.

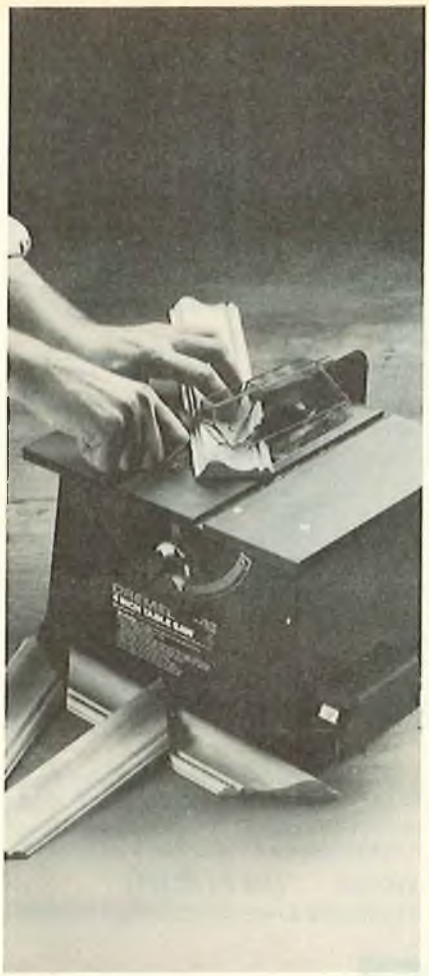
With the wing and tail lift being proportional, good longitudinal stability is present over a wide speed range. This can be an asset in penetrating strong winds. Level flight is automatically assured and a bit of down trim can create the power needed when greater penetration is desired.

Perhaps we should further explain this penetration design feature. Penetration is prevented by a design's inherent drag and/or the lack of power to overcome the wind force. The available power is created by gravity and is fixed by the model's weight. Model weight is detrimental to soaring ability; hence, the ability to add weight (ballast) only when needed is an asset. While the use of ballast may reduce soaring ability, additional power may be more important in some cases if greater penetration is desired.

Thus, it would be advantageous not to use ballast in competition when others have to use it. If we can enter the wind with the least possible amount of drag, we can delay the need for ballast. If we can also enter the wind with a level or nose down model attitude, we will have maximum or above power without the addition of ballast.

With this design there is a constant lift balance between the wing and tail. As the airflow speed changes, the lift generated by both components changes proportionately. If the model attitude is flat and level, it will remain so throughout all airflow speed changes. Thus, on entering a strong wind, no trim is required to maintain the level flight, least drag, attitude. No trim also equals less drag. If this level flight also produces maximum lift, and you are in lift conditions, some of the lift can be sacrificed by trimming for a slight nose down condition. In that attitude some power is gained to further aid the penetration.

In short, aerodynamics can be used to increase the inherent penetration ability delaying the need for ballast. If the aerodynamics work well enough, ballast may never be needed in tolerable wind conditions --- yet, you still have have ballast as an "ace in the hole."



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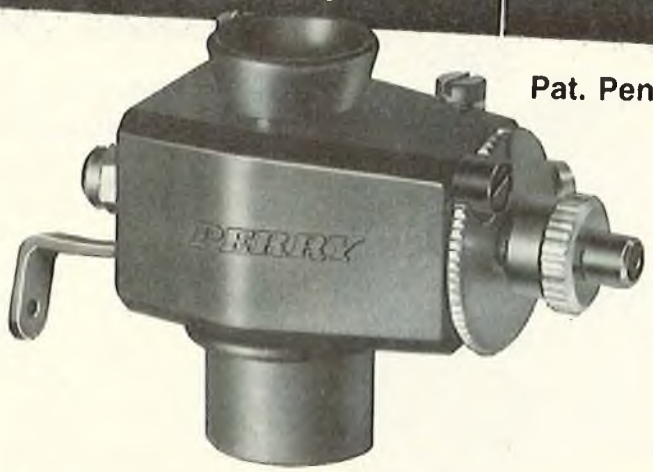

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Conclusion:

It should be obvious that the features of the "Soarer" are different from most current designs. Then too, it would be questionable whether the use of **any one** of them would offer an advantage. It is the **combination** of the factors working together which creates success. But that was what the research of 40 years ago taught us!

Assembly:

There is only so much which can be done with the space available for an article. This time the design story seems much more important than would be the "glue A to B" sort of thing. This structure is a simple one, the drawings are extremely detailed. There are no new or mysterious methods used. With the info given on the drawings, any accomplished builder should have no problem with the assembly.

Flying:

What to expect:

(1) The initial test flights of the prototype were made in 20 mph winds. Much flying has continued in strong winds as well as calm. Don't expect miracles; penetration is tough in real strong wind, yet very good in moderate wind. Obviously, flight is as expected in anything less. The point is that you do not need to remain "grounded" by any tolerable wind condition.

(2) The "Soarer" tows "straight," easily, with any type of launch. Maximum "hi-start" power is handled neatly. Any amount of "winch power" considered normal creates no problem. The available lift will easily carry the line to the apex assuring maximum possible launch height. The thought has been that adding another 50' of line could be an asset.

(3) Control: Do limit the elevator to the amount indicated. Rudder trim is very insensitive. Rudder action is good under all conditions. The spoilers are extemely effective — too much so on the prototype. The width has since been reduced. Simply "cracking" them open has been effective on landing approaches. Do be **cautious** when using any greater amount.

(4) Adjusting: The wing setting and C.G. location should be checked and then left alone. No ballast should be required. The desired flight path should be flat and level, not nose up. Any lift encountered will "bump" the model up telling you it is there. If the model should not fly "on the step" or flies "nose down," compensate with stabilizer incidence changes as indicated by the required elevator trim. Adjust to obtain neutral elevator.

Should you wish to, experiment with C.G. location as suggested. As

to page 150

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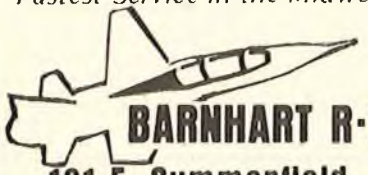

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1/4 Scale Kits $6.00 Radios $4.50 Kits $3.00

Other $2.00. Engines: Under $100.00 add $3.00 over $100.00 add $4.50

from page 148/40

you move the C.G. back, **increase** the stabilizer angle so that the flight remains "on the step." Caution would suggest not going above 3½ degrees of stab incidence.

(5) Thermal flying: If the thermal size is great enough, setting the model in a tight turn can be advantageous. Once the turn is established, up trim can be fed in until an "upward spiral" is achieved. The rate of climb appears to increase as a result. Most often the thermal size is small; then the best method seems to be to simply fly straight through it, execute a 360 degree turn and repeat --- gaining altitude in steps so to speak.

(6) Landings: With a low sink rate you can cruise around close to the ground quite a bit which can be advantageous when orienting the touch-down. Quickly learned while spot landing: If there is any amount of wind present, flying the landing approach **across** your line of sight (so that forward speed can be observed) seems more important than is precise direction. Plus the spoilers offer a good control of the rate of sink as the spot is approached.

(7) Finally: The "Soarer" was never intended to be a "super" glider, it takes **complexity** to create the great one these days and that does not breed simplicity. You should find that it assembles quickly, is very enjoyable to fly, and has above average performance for its type. It is a **fun design** which demonstrates some interesting aerodynamics which you can soon appreciate. If it does teach you some things, perhaps it can lead you to that coveted Championship. In the meantime, **enjoy**, have fun! □

from page 39/38

slight undercamber of the true 193. I suppose, like everything else, it is 90% pilot, but it is a pleasure to watch Dave fly that little bird.

★

Speaking of Dodgson Designs, I took the opportunity to stop in at his sailplane factory on Camano Island, on my way up to B.C. Camano Island is in the Puget Sound, between Seattle and the Canadian border. I always imagined that one had to be near civilization to manufacture anything.

to page 166

"Not too long ago I was speechless. Now I'm teaching Ben how to talk."

Donald Stevenson Benjamin Evans

Cancer of the larynx is one of the most treatable cancers. If discovered in time, 9 out of 10 patients are curable. Of these, two-thirds learn to speak again, thanks to a rehabilitation program of the A.C.S. Early detection and prompt treatment can save your life and your voice.

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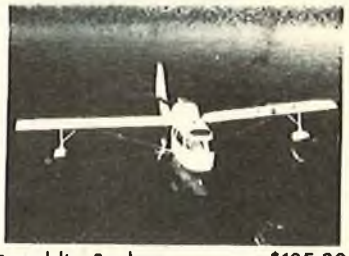

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EMS SR1 SERVO REVERSER
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BATTERY PACK — 500 mah fast charge
Wt: 4 oz., Size: 2.2 x 1.25 x 1.25
Gold, Ivory, White, Black
$14.95

	EMS-20H	EMS-15II	EMS-15IIH	EMS-14II	EMS Bantam Mid.
Thrust (oz.-in.)	56	38	48	29	21
Weight	2.0 oz. (57g)	1.8 oz. (51g)		1.4 oz. (40g)	0.85 oz. (24g)
Transit Time	0.4 sec.	0.5 sec.	0.4 sec.	0.5 sec.	0.4 sec.
Size (in.)	1.68Hx0.92Wx2.13L	1.50Hx0.92Wx2.13L		1.50Hx0.76Wx2.01L	1.125Hx0.7Wx1.43L
Outputs	Rotary Wheel & Arm (-20, 20H, -15II, -15IIH, -14II)				rotary wheel, long arm adjustable arm
Colors	Gold, Ivory (-20, -20H, -15II, -15IIH, -14II)				gold ivory orange red blue yellow white black
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Add $2.50 for shipping and handling

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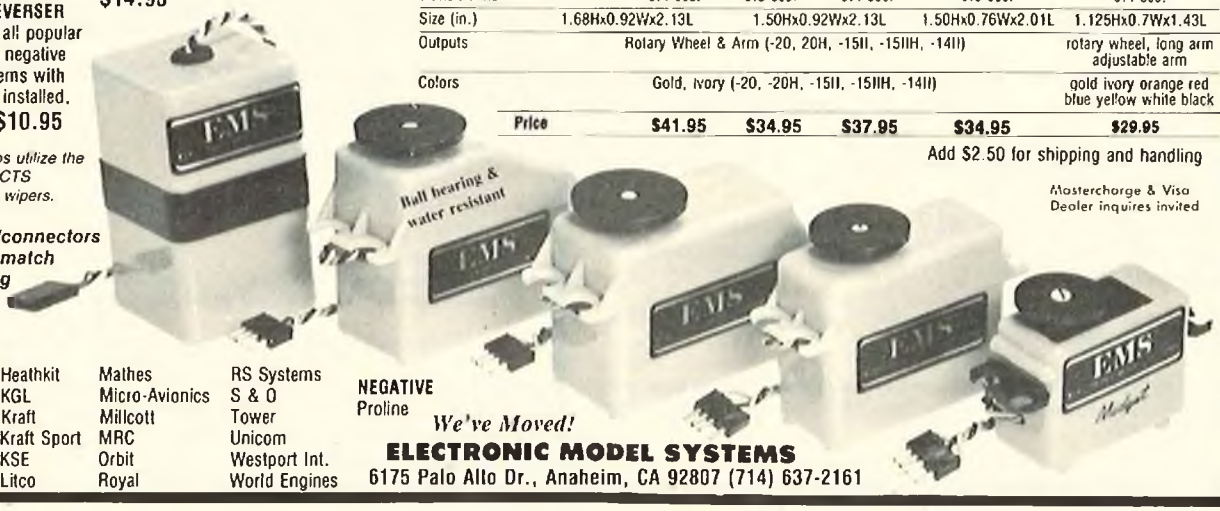
Dealer inquires invited



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SOARING

from page 150/38

Dodgson Designs proved otherwise. It is a remote outpost at the end of miles of country road. How Bob gets anything done in a beautiful location like that is beyond me. It's where others go for vacation. He has the Puget Sound at his back door, and dense forest all around.

The President of Dodgson Designs is Robert G. Dodgson. He is also Chief Engineer, Production Supervisor, Worker, Quality Control Supervisor, and Janitor. He is a one-man band. You will never find a little slip in a Dodgson kit that says, "Assembled by #24." If anything is wrong, Bob knows exactly who to fire. This is cottage industry in a pure form. Bob does all his own fiberglass lay-up, his own foam cutting, balsa sawing, etc. He fabricates hardware items such as flap mechanisms but has things like brass tubing delivered to size.

Bob Dodgson graduated from the University of Washington with a degree in Architecture. He served his apprenticeship in an Architectural office, but then decided he really didn't want to be an architect when he grew up. So, he went back to Camano Island, settled near the old homestead, and started building toy airplanes.

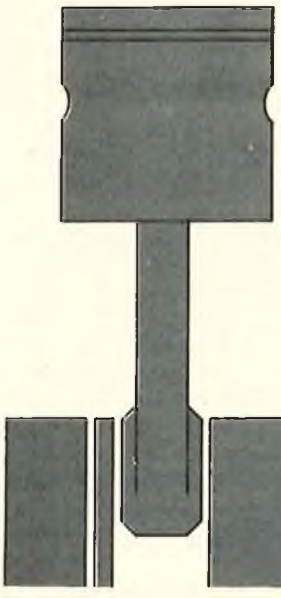
Dodgson Designs are all high performance, multichannel sailplanes, the latest of which is the Camano line. The Camano has an 111" built-up wing; the Camano 100 has a foam core 100" wing, and the K-Minnow has a 2-Meter wing. All have aileron, elevator, rudder, flap, and spoiler control. Bob believes that the future of high-performance competition soaring is with the multichannel glider. More than that, he says, "Multichannel control gliders are simply more fun to fly, whether thermaling or slope flying." Anyway — it was a most interesting morning; so away we went back up the long country road toward Canada.

Howzat! □

SUNDAY FLIER

from page 37/36

with wingspans of four to five feet). Then, when you apply power and the model comes up on the step, both tip floats are well out of the water, and,



aps motori

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or for not residents: **aps** Casella Postale 129 - 20052 Monza Italy

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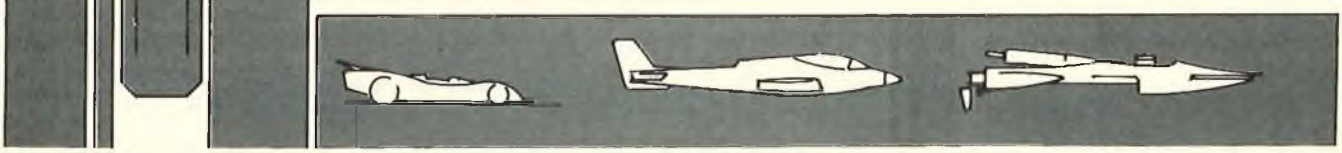

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Prather 35" Tunnel

- Designed for K&B's New 7.5cc Outboard
- Length - 35"
- Beam - 15½"

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★Epoxy Fiberglass Hull
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The new Prather Tunnel will reach speeds in excess of 50 mph using K&B's new 7.5cc outboard engine. Our testing program was conducted by Norm Teague who holds the NAMBA 3.5 outboard tunnel record using a Prather 29" Tunnel. Norm says our new larger tunnel corners at full speed with no tendency to spin out or blow over. This larger tunnel is ideal for the beginner because it goes together quickly following our step by step photo instruction books. The expert will find the hulls handling characteristics a real advantage in competion.

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FOR 7.5 K&B OUTBOARD ENGINE

★Adjusts engine angle (positive or negative)
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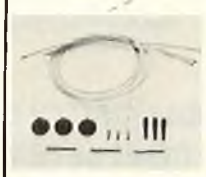
FOR THROTTLE AND STEERING



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Features Heavy Duty Cable

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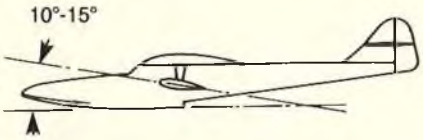
unless a vicious cross wind gust hits the model, take-offs are routine.

One other thing; tip floats are needed only when the model is at rest. When it is moving forward, you want the float to act sort of like a skipping stone; if the float bottom hits the water in a cross wind gust, it should tend to force the float up and out of the water. That means, slant the bottom of the float forward at a higher angle than the forward part of the hull bottom. How much? Ten degrees, maybe fifteen. It's not too critical.



What about sponsons --- the lateral stabilizing surfaces which extend outwards from the hull? The Boeing 314 flying boat used them, and in retrospect I think the designers would have been better off using tip floats. In a cross wind, it was not at all unusual to see the downwind wing disappear into the water, making it very hard to turn into the wind. I wouldn't recommend them for radio controlled flying boats, unless your objective was to have a scale version of a full size design like the 314. And you'll have the same problems. See photo #3.

Through the years there have been some very interesting experimental designs. Back in 1931, Major Alexander P. de Seversky and his colleague, Alexander P. Kartvelli designed a twin float amphibian on which the wheels were inside the floats and extended out the bottom of the floats for runway landings. (Photo #4). The Martin Company actually test flew one of their huge PBM-5 patrol planes by taking-off from the water on a hydroski which had been added to the bottom of the hull (Photo #5). Lockheed Georgia Company had Len Purdy (originator of the Lanier plastic line of R/C models) build a 1/16 Scale model of a converted Hercules C-130 with a flying boat hull and waterski (Photo #6 and #7). The whole objective of these tests was to determine if the idea would work; if it did, a great deal of weight could be saved in the hull structure since it wouldn't have to take the full impact loads of water take-offs and landings.

There's still a lot to learn about water flying --- and R/C seaplanes and flying boats make excellent classroom experiments. So go to it. Tell me what you learn, and we'll pass it on.

Don't "sink or swim." Skim and fly! □

The Plain Gray Wrapper

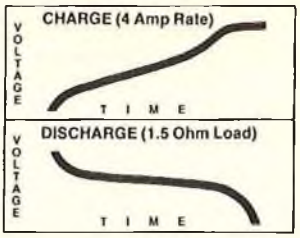
R/CARS 1200 MAH SUB-C NICADS

The Good News

PRICE AND PERFORMANCE

These are R/CARS Sub-C's. They have 1200 MAH capacity, resealable vents and solder tabs—just like the GE Sub-C's you're probably using now.

R/CARS Sub-C's come as pairs for easy assembly of either 4 or 6 cell packs.



Charts show charge/discharge characteristics of R/CARS 6 cell pack. Curves are typical of prime commercial grade Sub-C Nicads.

Price Comparison:

	GE	R/CARS
6 cell	$32.50	$15.00
4 cell	$24.50	$10.00

These are typical prices as supplied by various OEM sources and are subject to change.

The Bad News

1st - R/CARS Sub-C's are homely — Plain Gray Wrapper.

2nd - GE Sub-C's come pre-assembled in a pack of 4 or 6 cells. R/CARS don't, they come as pairs with solder tabs. That means you have to make a couple of solder connections for a 4 cell pack — a couple of more for a 6 cell pack. A $16.50 savings for 10 minutes work. At that rate you'll be saving about $100 an hour. And that's the bad news!

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from page 32/24

Important: When hinging the ailerons to the wing, be sure to **glue aileron horn wires into the ailerons. Do not glue** ailerons to nylon tubing!

Final Assembly:

1. ☐ The top edge all around the cabin area should be lined with foam sealing tape.

☐ Mount the wing on the fuselage using rubberbands (at least seven #64s are used on **each side** for flying). Measure from the fuselage sides to the wing tips, then from the wing tips to the back end of the fuselage to make sure the wing is square with the fuselage. Mark the wing center at the L.E. and T.E., and the fuselage, with matching line-up points. Color Stripe tape can be used, or certain marking pens.

☐ Using no glue, trial fit the stab in place on the fuselage, marking it for center, and adjust as necessary to line up with the wing. Then measure from the stab tips to the fuselage front to make sure that the stab is square with the fuselage. Mark match-up lines on the fuselage and stab for alignment.

☐ Strip covering from the bottom of the stab center where the stab contacts the fuselage, being certain to leave enough covering **firmly bonded** to the stab center (minimum 1/8" to 3/16"). Glue the stab firmly to the fuselage.

☐ Trial fit the fin in place on the fuse/stab. Glue the fin firmly in place and square with the stab.

2. ☐ Insert wire main gear struts in the fuselage. Position nylon or sheet metal landing gear straps; then mark, drill, and mount with #2 x 5/16" screws.

☐ Install nosegear strut in the bearing and steering arm.

☐ Install wheels and wheel collars on axles.

☐ Install fuel tank and lines. Support the bottom of the tank with foam rubber. Add foam on sides to center tank.

3. ☐ Set R/C airborne equipment temporarily in the fuselage per plan for approximate location. Rubberband the wing in place on top of the fuselage. When flying, use at least seven #64 rubberbands on each side.

☐ Lift the model under the wing near the fuselage by fingertips. Try fingers under the main spar first and

see if the model is approximately level. If necessary, move fingers backward or forward until the fuselage is level. Check to see if this balance point is within the range shown on the plan. If necessary, remove the wing and shift the R/C equipment away from the heavy end of the model until you achieve balance.

☐ Mount the servo tray.

☐ Wrap the battery pack in 1/2" soft foam rubber, using rubberband or tape to hold the foam in place. Position the battery in the fuselage and hold in place with additional foam rubber.

☐ Wrap the receiver carefully in the foam, like the battery. Reconnect all cables so the R/C system is operational; be sure each servo is plugged into its respective receiver terminal.

☐ Lead antenna wire up and back along the cabin top doublers, out the top rear of the cabin, and fasten the rear end with rubberband to the top of the fin.

☐ Gather excess cables together behind the receiver and hold down with foam.

4. ☐ Solder threaded coupler to 1/16" wire, then screw Mini-snap onto the coupler.

☐ Run 1/16" wire back through the nylon tubing to the servo, then attach Mini-snap to the throttle arm. Make sure the throttle servo is at idle position.

☐ Run the rear end of the wire through the pushrod connector, or bend up the rear end to pass through the servo wheel. Cut off most of the excess wire.

☐ Move pushrod back and forth to simulate servo action. Pushrod should move freely. If not, adjust the wire where necessary. Check to see that the throttle servo movement is within the range of the throttle arm movement. Glue nylon guide tube to former B and the fuselage side.

☐ Similarly, hook up the nosegear steering pushrod. Check to see that the nosewheel points dead straight ahead.

☐ Position the elevator pushrod so that the top of the elevator is about flat with the top of the stab. Allow additional 5/16" wire past the servo wheel hole, then cut and bend the forward end of the pushrod and attach to the elevator servo wheel.

☐ Similarly, position the rudder pushrod so that the rudder is aligned with the fin, then attach the wire to the servo wheel.

☐ With the aileron servo installed in the wing, tape the ailerons in neutral position, and complete installation using C.G. True 1/16" pushrods, Mini-snaps, and adjustable horn brackets.

to page 173

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★ FOUR FOLDING LEGS - - Lock up & down by use of machined metal locking device. Raises unit to 34" working height.

★ FUSELAGE HOLDERS - - Raise up & lock and are adjustable from 1¼" to 5¼" Lined with neoprene coated sponge rubber.

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★ CONSTRUCTION - - - - - - Birch plywood & Maple hardwoods, aluminum, steel, and brass machined parts. Interlocking construction.

★ FINISH - - - - - - - - - - - - - Medium Pecan & Urethane. Very durable.

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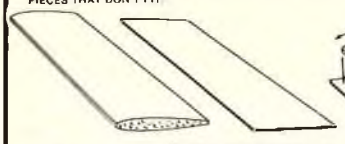

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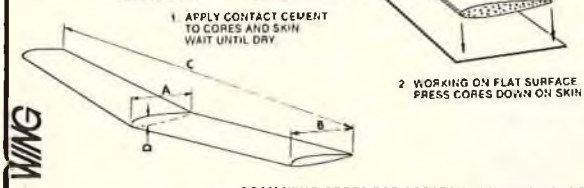

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#F3	8-1/2"	8-1/2"	C=50°	D=1-1/8"	$ 9.95 set
#F4	10-1/4"	10-1/4"	C=67°	D=1-5/16"	$16.50 set
#F5	10-3/4"	10-3/4"	C=54°	D=1-1/4"	$ 9.95 set
#F6	11-1/4"	11-1/4"	C=64°	D=1-1/2"	$15.50 set

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#S3	8-1/2"	8-1/2"	C=48°	D=1-1/8"	$ 9.95 set
#S4	9-3/8"	9-3/8"	C=54-1/2°	D=1-3/8"	$ 9.95 set
#S5	10-5/8"	10-5/8"	C=66-1/2°	D=1-3/4"	$15.50 set

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ITEM	A=	B=	C=	D=	
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#Y2	8-7/8"	8-7/8"	C=46-3/4°	D=1-1/2"	$ 9.95 set
#Y3	10-3/8"	10-3/8"	C=48-1/2°	D=1-11/16"	$ 9.95 set
#Y4	11-3/8"	11-3/8"	C=60°	D=1-7/8"	$15.50 set

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ABOVE CORES COME WITH CONSTRUCTION PLAN SHOWING HOW SKINS ARE GLUED ON AND ALL METHODS OF INSTALLING LINKAGES, AILERONS, SERVOS, ETC.

EAGLE 63

from page 171/24

☐ Install switch and charging jack cover plates on the fuselage side opposite to the engine exhaust. Mark through the cover plates for holes and openings.

☐ Make holes through the fuselage sides, then install the switch and jack.

☐ All pushrods should be checked to see that they move freely without binding; adjust if required for smooth operation.

☐ With trim tabs on the transmitter centered, check to see that the rudder aligns perfectly with the fin, elevator top is flat with the top of the stab, and that the nosewheel points straight ahead. Adjust Mini-snaps as necessary. Also make sure that the surfaces move in correct direction when the transmitter sticks are operated.

☐ Measure the aileron movement with full stick deflection right and left. Total movement should be approximately 5/8".

☐ Check engine, and adjust needle valves for dependable idle and smooth high speed.

5. ☐ Flying the model is simple, as befits a sport and trainer model. Take-offs require a touch of back-stick (more off of grass), and turns are made with either ailerons or rudder. For landings, the light weight and high lift airfoil tend to make the ship land farther down the runway than one might anticipate. After the first landing or two, adjust the rudder and elevator by means of clevises, according to indications of the trim tabs.

I will appreciate hearing from you with any comments or suggestions. Best of luck! And have fun — that's what the hobby is all about!

☐

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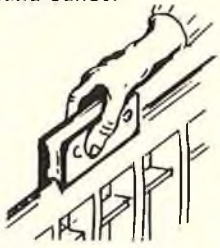

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HERE'S HOW

from page 22

the above problem. It came from John P. Thomas, who resides overseas. John says:

"Go down to your local Radio Shack store and buy some of their surplus small magnets. They are about 18 mm by 25 mm and about 4 mm thick. All I have ever seen have a 5 mm hole drilled in the center. If I recall correctly, they are about 25¢ each. They are dark gray and look as if they might be from small radio speakers. Take one home and fix it to the top of your workbench with a drop of Hot Stuff or a small piece of double-sided Scotch tape. Then when you set your knife down on the bench, simply place it so the blade (not the handle) is resting on the magnet. The knife will stay in place until the next time you reach for it."

These magnets are really handy around the shop; use them to pick up straight pins from your bench (in a hurry) and for retrieving metallic objects which have fallen inside the fuselage of an airplane (like servo mounting screws). □

FLYING LOWE

from page 16

competition. Maybe we've just not had time to develop new airplane designs, or maybe retracts still help flight performance. Of course, in the U.S. a lot of Masters competition events still judge the take-offs and landings.

Dean also reported a rather unique, and apparently effective, technique that Doctor Jim Edwards, chief judge, employed for the finals. He used the eight regular judges, plus an additional eight selected from the competitor non-finalists. These competitor judges sat behind each of the regular judges and also scored. Their scores were not used in the final tabulation but, apparently, the peer pressure helped assure more consistent scoring by the official judges. Neat trick, Jim; wish I had thought of it. By the way, for those pattern filiers who may not know Jim Edwards, the guy was a top flight competitor for many years. He then got out of it for a long time, doing a lot of other things, but is now once more in the battle and doing well. I watched him win the Pensecola contest in May. In recent years, Jim has been doing a great job as the chief judge of the Circus Circus Tournament of

Champions.

Uncontrollable Snap: I received a letter from Ken Miko of Schuylkill Haven, Pennsylvania, concerning a problem that may have happened to many of you fliers. He writes:

A few months ago I purchased a scratch-built Phoenix #1 from the owner of my local hobby shop. He had built this aircraft and flew it for many enjoyable flights. After I began flying it I became aware of a wacky snap roll that would occur at the completion of a tight loop. At first I believed it to be a radio problem but, after considerable checking on the ground, I decided the snap roll must have been caused by me unknowingly moving the aileron control. I have made about twenty flights and every once in a while, if I do a tight loop, the same uncontrollable snap roll occurs at the completion of the loop. I have begun to be confused as to whether the problem was radio, plane design or me. I must add that I am a Sunday flier who enjoys quick, violent type maneuvers.

Recently a good friend, who is the best R/C flier in my area and who also has flown this Phoenix many more flights than I have came to our field and flew my aircraft. His Cuban 8's and other high and smooth aerobatics were beautiful to see. He then put the beast into a tail spin, pulled out and flew about twenty feet horizontally at which time the aircraft did a roll to the left and went into the ground resulting in the loss of a beautiful Phoenix.

I am convinced this was not pilot error; also the batteries checked very well under load after the crash. The plane was powered by a HP .61 and had been clocked in excess of 110 mph with a police radar unit. Can you give me any help on why this weird snap roll might occur after pulling out of a loop or, in this case, a tail spin? I have sent the receiver and servos to the manufacturer just to be on the safe side. But from the flights I made with the Phoenix, I believe it to be a characteristic of the aircraft. Several checks were made on the airplane over the past weeks for loose servos or control cable that might be flexing under a high G load but I honestly never found a good reason for my problem.

Also several flights before the crash I had taken out some elevator throw; the thing I understand least is why the problem only occurred on occasion and only under high positive G load.

Thanks, Ken, for your letter. The problem that you describe could happen to any design with a fairly high wing loading, an aft C.G. location, or excessively large elevator throw. Obviously, what's happening on the bottom of the loop is imposition of a very high load factor, then the

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wing stalls and the ship snaps. For a constant diameter loop and fairly consistent flight speed, the load factor "G's", or the apparent weight that the wing must support, varies with position in the loop; it is minimum at the top and maximum on the bottom. Gravity subtracts at the top and is additive on the bottom. So, if the ship has any tendency to snap inadvertently, then it should happen on the bottom of the loop, as you describe. The Phoenix I had a lot of wing sweep and it had a nastier snap characteristic than straight wing aircraft or the later Phoenix designs. This happens in a highly swept design, for this reason: if the wing tip stalls first, then the center of lift moves rapidly forward, creating a rapidly increasing aft C.G., further aggravating the problem. This gives the ship a very abrupt snap character.

If you want a ship that will not snap or hardly stall, then build a straight wing with washed out wing tips. We designed our military remotely piloted vehicle (RPV) with a wing of this character. The wing is tapered with about 3° of wing tip wash-out (decreased wing tip incidence). The stall character of this wing is very mild; in fact, it will not snap but simply mushes through. Those looking for a good trainer design should find (or design) one with wing wash-out. If you couple this with a forward C.G. and low wing loading, you will have a very forgiving airplane. The only difficulty with wash-out is that the effect reverses in inverted flight or outside loops and you effectively now have wash-in, which is very bad. Wash-in, or increased tip incidence will give you a bad abrupt stall. What I have done in the Phoenix designs with wing sweep is to thicken the wing tip section percentage (thickness/chord) in order to delay tip stall.

to page 184

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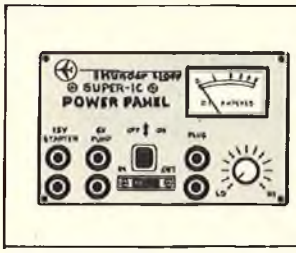

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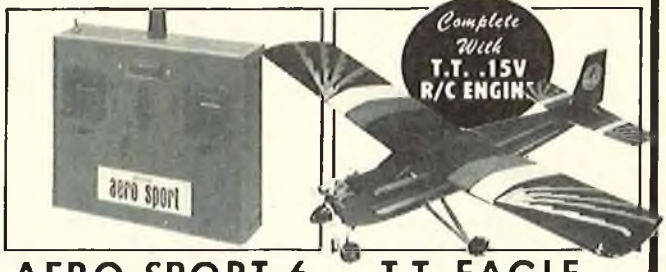

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FLYING LOWE

from page 176/16

To sum up these ramblings, the essence of a mild stall character in wing design does not allow the wing tips to stall first. In fact, if sufficient wash-out is used the tips may never stall, so that good lateral control is maintained in the stall until the ship regains flying speed.

"He that stalleth, falleth:" While we are talking about stalls, let's talk a bit about flying technique that may keep some of you beginners out of trouble. The wing supports the aircraft; the lift that it can generate is a function of its area, flying speed, and certain other design characteristics. It is also important to understand that its ability to support the aircraft is also reduced in a banked attitude, since the wing lift is generated normal (or at right angles) to the wing.

In view of the above, the worst possible combination or flight attitude inviting stall and a crash, is a slow, nose high, banked turn on the approach to landing. Now, how many are guilty of this? The fact that so many modelers survive this condition is a tribute to the design and **low wing loadings** used in our models. Never make a power off approach to landing in a nose high banked turn! Keep the nose down and the air speed up! Remember that unless the wing is lifting and you have control, all is lost.

The single most important thing to remember in flying is to **maintain control** at all costs. How many times have you read of or seen someone with a model stalling and diving out of control, trying to stretch a glide?

Pattern Design Trimming:

I had a couple of calls this week, concerning a difficult and sometimes mysterious problem in trimming a pattern ship. George Asteris of Boothwyn, Pennsylvania, called concerning a problem he has with a "Brushfire" which pitches down with application of left rudder, and up with right rudder. This common problem can usually be helped by using one or a combination of techniques which we've talked about before. Usually shimming the wing leading edge down a bit will help this; also, raising the ailerons will work. Another technique is to tip the thrust line up and move the C.G. forward.

The strange thing about all this is that the techniques mentioned usually help both conditions, i.e., pitch down with left rudder and pitch up with right rudder. Now, if the phenomenon is reversed, i.e., pitch up with left rudder, then reverse the trimming procedure.

As I told George, Steve Rojecki had the identical problem with one of his Brushfires. His solution was not one of the above; he found that the stab incidence was not at zero, per design, but about 1° negative. His solution was to cut out the stab and reset it to zero. After that, the ship flew perfectly! I personally flew that ship before and after the operation and can attest to the fact that the ship went from an absolute dog to a very fine flying ship.

We've explored this problem for some time and I really can't give a very scientific reason for why the ship does what it does. We have developed some fixes, however, over the years that seem to work. I am convinced, however, that the vertical position of the stab relative the wing and thrustline is a potent influence; also, the stab incidence. I'm convinced that if we had the flexibility in a design to move the stab up and down and adjust its incidence, we could perfectly trim the ship. It seems to me that the best stab arrangement would be a conventional elevator plug-in set-up. I

to page 186

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FLYING LOWE

from page 184/16

have this on one of my ships and have used the flexibility to fine tune the stab incidence.

Well, I've run out of steam — and material — for this issue. Please feel free to write or call for an exchange of ideas. I would like very much to use your experiences in this column. My address is:

Don Lowe,
902 Little Bend Rd.,
Altamonte Springs, Fl. 32701
Phone: (305) 862-4552

□

ENGINE CLINIC

from page 14/12

Flying from a dirt field without an air filter will make for very short life expectancy, so if this is the case be sure to install either a Perry or K & B filter.

K & B is in the process of updating the front rotor .40 (#8011) with a fully machined from bar stock rod that will be bushed at both ends and bushings in the wrist pin holes of the piston. The front prop drive spool will also be changed to the collet type as used on the 3.5 and 6.5 rather than the set screw and roll pin type presently used. The release date has not been set at the time of this writing, but should be very shortly.

Dear Mr. Lee;

With the booming popularity of the 4 stroke motors (I have five — a Saito FA-30, FA-40, FA-80 Twin, an O.S. "60", and an O.S. FT-120 Gemini Twin), don't you think it is high time some of the fuel manufacturers put a "four stroke" fuel on the market? Or that some information should be published stating how much methanol can be added to "two stroke" fuel for "four stroke" motors? I have read that "four stroke" motors can tolerate a much lower oil content than "two stroke" motors and will actually perform better on less oil! But how much less? Where can you buy methanol by the gallon to add to "two stroke" fuel?

I am very happy with the four stroke motors in scale and sport planes. They are not for the hot speed or pattern planes --- great for "old timers." I'm going to put my O.S. Gemini Twin in a Bridi Corbin Baby Ace 1/4 Scale, or the new Sig 1/4 Scale Clipped Wing Cub. Expand your coverage and info on "4 strokes."

Yours truly,
Glen Boepple, Sr.
Wooster, Ohio

Trying to market a four stroke fuel could be a very touchy situation due to the varying oil requirements recommended by the various four stroke engine manufacturers. Generally speaking, four stroke engines run a lot better with lower oil content fuel. This is due to cooler operating temperatures. By firing every other stroke, the fresh fuel charge cools the engine between power strokes. 15% oil seems to be a safe figure. I have run several four stroke engines that had bad idle and acceleration characteristics that improved immensely by using 15% oil rather than 22%.

Although methanol alcohol can be obtained from most any chemical supply house, the price is usually pretty steep. The best source is a hot rod speed shop that sells fuel to the drag racers. They handle only the highest grade and at a much lower price. Not all speed shops handle fuel but can steer you to a source that does.

Maybe after reading your letter, one of the fuel manufacturers will give some thought to the idea of marketing

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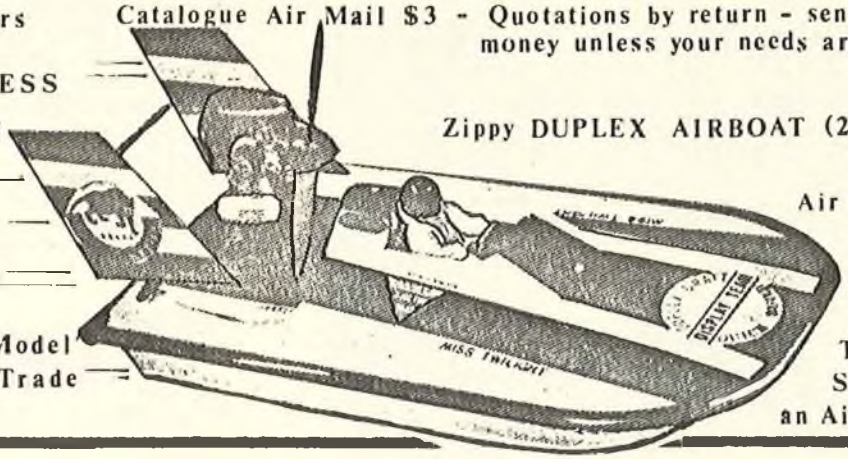

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a four stroke fuel.

Clarence,

Here is a simple problem that I don't think I have seen mentioned in your column in the last year.

My six month old O.S. FSR .25 has been used in three different planes with their own tank systems. It has normal compression, starts and runs fine with this one exception — it will sag and quite often die in the middle of the take-off or at the ground run-up if I hold it long enough. The carb has been cleaned, tank lines blow perfectly clear when no fuel is in the tank, the muffler vent is in the factory position on top and is clear when blown on and I have tried every high speed needle position. The idle always has been good.

On one run-up I noticed bubbles in the muffler pressure line slowly making their way toward the tank. This seemed okay until the engine did its usual sag. It came to me that maybe the bubbles were being pulled by the suction of the carburetor rather than the pressure of the muffler and that the vent line was actually being plugged rather than pressurizing the tank. Since everything else had been tried that I knew of I pulled the vent line off the muffler, reset the needle valve (leaner) and have had no flameouts since.

The muffler vent is clear and the muffler seems clean on the inside. The muffler is tight on the engine but has no gasket.

Can residual exhaust oil be permanently fouling up my muffler — and how would I clean it?

Thanks for your interesting magazine.

Ken Lance
3 Mile Bay, New York

If fuel plugs up the line from the muffler to the tank, the engine is going to go lean after a few minutes of running. It is the same thing as plugging the vent. Normally this is not a problem. You must have a lot of castor oil in your fuel, are flying in cold weather, using too small a diameter fuel line, etc. Drill out the muffler pressure fitting to at least 1/16" and use medium size fuel line. Blow the line out once in a while. Possibly fuel is congealing in the line after your plane sets between flying sessions.

If the engine runs okay without the muffler pressure then go ahead and run it that way. You don't necessarily have to use muffler pressure. Generally it is beneficial but if not in your case then forget it.

The O.S. mufflers are pretty restrictive and generally provide quite a bit of muffler pressure. However, possibly you are flying the engine very rich and excessive oil and exhaust residue is collecting in the muffler. A slug of this is finding its way into the pressure line and plugging it. Increasing the size of the hole in the pressure fitting and the use of medium size fuel line should solve this.

Dear Mr. Lee:

In your article in June 1979 in R/C Modeler Magazine, Joseph Micalizz referred to your basic formula for mixing fuel.

I would like to mix my own fuel and would like to have your formula. I race 1/8 Scale R/C cars so I need to use castor oil instead of synthetic oil because of the heat factor.

I have been told that you need to use a small amount of synthetic oil as a mixer and Amyl Acetate as a stabilizer. Is this true? Your help would be greatly appreciated.

I read your article every month. Being new in the sport, I have learned quite a lot from your articles about tuned pipes and other hop-up ideas. From a beginner, thank you very much for your articles.

Sincerely,
Kenneth J. Brown
Sacramento, California

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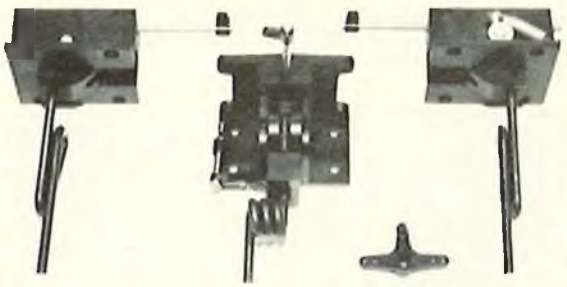

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misinformation Ken. The only time Amyl Acetate need be used is if you are using straight castor oil/alcohol fuel. The castor has a tendency to settle out and the addition of an ounce of Amyl Acetate (banana oil) to a gallon of fuel will keep it mixed. Nitro methane does the same thing so the Amyl Acetate is not necessary in any fuel containing nitro.

Castor oil and nitro methane will only mix in concentrations up to about 40%. Above this, the castor will settle out. In the past we used nitro benzene for this purpose but nitro benzene is highly toxic and hazardous to your health. For this reason most fellows use synthetic oils if more than 40% nitro is going to be used since the synthetics will stay mixed in any concentration. A mixture of synthetic oil and castor will allow a higher nitro percentage.

For R/C cars, use 18% castor — 5%-40% nitro — balance alcohol. The amount of nitro will depend on the event. For all-out speed you use higher nitro — for Enduro events, the lower. A lot of fellows are using special oils in percentages as low as 12% but this is for those who are experienced at 1/8 Scale car racing. As a beginner you had better stick with a safe fuel mix to avoid burning up your engine.

Dear Mr. Lee,

Having just returned to the world of R/C after a long absence, I enjoy your column very much as it answers many questions I have regarding the new engines and functions thereof. Operating in Thailand, we encounter many problems that are not faced by those in the United States who enjoy a wide variety of products from fuel to spare parts.

In Bangkok, there is one model shop which does not even carry servos for my new Futaba FM transmitter which I purchased in Hong Kong. The question I have concerns fuel of which we have to accept the fuel available at the shop or

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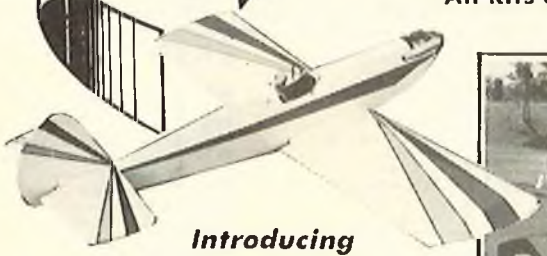

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are forced to mix our own. I am planning on mixing my own fuel but none of the extra ingredients for lubrication are available here. Only the right alcohol and castor oil are available. Should I mix these with 75% alcohol and 25% castor oil as mentioned in your flight manual? Will this give me proper lubrication? Is there any item that is common to the auto parts store which would provide the additional lubrication needed which might be available here?

The second question has a little to do with the first. I have been learning to fly with a Japanese high wing trainer and an O.S. .45 engine. I have had about 15-20 flights per glo plug until this last weekend. I went through 4 glow plugs in about 10 flights. The engine never slowed down but appeared very hot after each flight and when I tried to start it up again, found that the plug was no good. I think this is due to improper mixing of the fuel by the shop, but can you confirm my thoughts along this line.

I am planning to mount a camera in a QB-60 which I now have and am building for photos near the Cambodian border. I need to have the plane fairly reliable and don't need glo plugs dying out in the middle of the flight. Your answer to these questions would be most helpful.

Sincerely,
Jeffrey L. Robbins
Southeast Asian photo editor
The Associated Press

When you use straight castor oil/alcohol you do not need 25% castor — 20% is plenty. It will actually burn cooler. Be sure the castor you are using is a degummed grade, otherwise you will run into all kinds of problems. There is nothing available through auto parts stores that will improve the fuel lubrication. With a fuel mix of 20% castor/80% alcohol you shouldn't need any. As mentioned in the

to page 192

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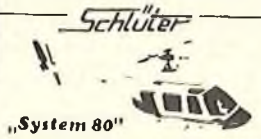

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ENGINE CLINIC

from page 189/12

previous letter — an ounce of Amyl Acetate to a gallon of fuel will help keep the oil from settling out.

If an engine starts going through glow plugs it is usually caused by running the engine too lean or something is wearing in the engine. Any metal particles passing through the engine will blow the glow plug right away. Check the oil residue on the wing of your aircraft. Wipe some off with your finger and hold up to sunlight. No metal particles should be visible. Chances are you may see some in yours. A rod rubbing on the back plate, upper end of the rod wearing, etc., could be the cause of your trouble. □

CUNNINGHAM ON R/C

from page 11/6

Now, use this template to draw all of the ribs required for the wing. Do not plan to use the template rib in the wing construction. Save this template for either possible repairs, or for another wing. Once all of the ribs have been drawn, proceed to cut them out with your blade. Stack all of the ribs into one large stack, line them up with the leading and trailing edge and then pin the stack, using pins from each side of the stack. When everything is true, use a sanding block and 120 sandpaper and sand the entire stack to the finished outline.

Check now and then with the master template to be sure that you're not altering the rib outline. By the way, don't make the spar slots when you're cutting out the individual ribs with the razor knife. Save these slots until later. Once the stack is sanded, use the master template rib to mark the location of the spar slots on the rib stack, then take a razor saw blade and carefully saw the spar slots in the stack. You can pick out the pieces cut loose from the slot. Use a steel file for metal filing to carefully shape the slot, checking all of the time with a piece of spar material to see that you have made the slots just the right size.

If you have access to a band saw you can make a rib stack by stacking up all of the wood needed to make all of the ribs, pin this stack to one complete block, glue the paper rib outline to the top of the stack, and then saw out the entire block to the rib outline. I always make at least one more rib in this method to save as a master template for any future use. Lightly sand the

completed stack, and you're ready to build. If the stack is larger than the lengths of the pins that you have available, then you can make your own pins by sharpening lengths of .045 music wire with a file or grinding wheel. Drive these pins through the rib stack with a hammer. Keep the pins for use on the next rib pack. Using the band saw method you can make a stack of wing ribs in fifteen minutes. The razor blade method takes a bit longer, but really not too much. Sure, it's easier to take a set of ribs out of a kit, but try building them yourself, it's really not much of a job. You can make all of the formers the same way.

★

I've received several letters this past month that I would like to pass along to you, along with some pictures of modified kits. This interest has produced some striking aircraft and goes to show once again just how inventive we modelers are. The first letter is from Guy Clapshaw, writing from Auckland, New Zealand.

Dear Chuck,

I enjoyed reading your October column and agree with the opinions expressed about kit conversions. I have modifed the trusty Andrews Aeromaster into a German pre-WW II Bucker Jungmeister and the result is most pleasing — the excellent characteristics of the Aeromaster are retained yet the Teutonic air of the Bucker are also apparent. Interestingly, there was very little modification required to the standard kit to get almost scale structure, rib spacing, etc.

I have often thought of the endless conversions possible; here are a few ideas. A Top Flite P-40 could easily be turned into a Hawker Hurricane, maybe two P-51 kits could make a twin Mustang, The Aeromaster also makes an excellent Pitts S-2 bipe (I have pictures of one), etc., etc. Once you start thinking about converting, the list becomes long.

Your column is enjoyed immensely down here in New Zealand.

Sincerely,

Guy Clapshaw

The picture of Guy's Bucker really shows what a beautiful job of conversion he did to the Aeromaster. New Zealand and Australia are places that I want to visit someday, so watch out, Guy, I may come knocking on your door.

Here is another kit conversion, again a bipe. This time my Sporty Ace design modified to yield an SE-5. Kit modification by Carl Tuveson of South Bend, Indiana. Picture by Jerry Smith. Carl calls it an SA-5. Power is by Fox .45, looks and flies just like WW I.

to page 195

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CUNNINGHAM ON R/C

from page 193/6

Jim Preston from Willow Grove Pennsylvania, sent in pictures of his modified kits, a Sig Kadet and Sig Kavalier. He made tail draggers out of both models, added wheel pants, changed an outline here and there and came up with two real beauties. On top of that, Jim tells me that his wife has really gotten interested in modeling and next year wants to learn to fly. Great Jim.

Jim Lewis of Laurel Springs, New Jersey, sent in a load of pictures and a run-down of the South Jersey Fly-Away Club Spring "One-Design" Contest. Each participant used a Balsa USA Phaeton bipe and modified it to suit himself. Fifteen kits were purchased and started, only five were finished in time for the contest, but the modifications were super. A Fokker D-VII, a Bucker Jungmeister (two of the entrants), a 1930 classic type, and a modern sport type. A really great way to keep the fun in modeling.

And, talking about fun in modeling, a letter from Dan Reece from Sydney, Australia, really keeps the fun in modeling.

Dear Chuck,

I feel sure you will find the enclosed information interesting. I felt it was about time we showed you guys the way to do it.

Regards,
Dan Reece

The enclosed information was an announcement of the fantastic event to be held just outside of Sydney, June 12 and 13, 1982. It is the 1982 Vintage Air Pageant and Races. Aircraft must have a minimum wingspan of 80" for monoplanes and 65" for bipes and tripes. Two types of categories can be entered, aircraft flown between 1903 and 1914 and aircraft flown between 1914 and 1930. The pilot and all pit crew must be in costume of the period of the aircraft entered. Replica hanger backdrops and area must be built or painted, the aircraft must fly in a realistic manner, with proper noise level and overall sound. "The pit area, aircraft, pilot and assistants will be judged collectively as to overall realism, attractive presentation and imagination. Advertising will be permitted of sponsors' products, providing that the product or service was available during the period

to page 198

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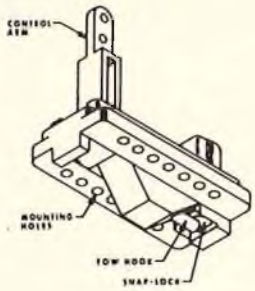

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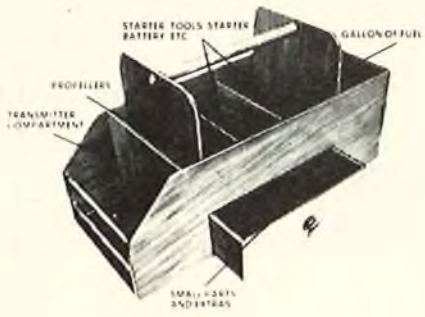

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CUNNINGHAM ON R/C

from page 195/6

represented, and then only on condition that the advertising copy and style of printing can be proved, by documentation to be accurate."

The competition is to be a ten minute flight projecting as much realism as possible. Entry fee will be $50.00 and the entry fee may be refunded by the pageant committee if the entrant's aircraft does not measure up to standards, and the entrant is unable to make all of the rehersals prior to the pageant. The actual pageant will be filmed by channel 10 in Sydney.

All in all, this should be a truly outstanding event. If you're interested in taking part, contact Dan Reece, Chairman 1982 Vintage Air Pageant and Races, Suite 1, Worth House, 686 New South Head Road, Rose Bay, N.S.W. 2029, Australia.

Dan, I sure hope that you fill me in on the pageant details after next June 12 and 13. Sounds like it's really going to be a great bash.

★

Modeling is made up of great people all over the world. It's really a shame that everyone hasn't given it a try; would probably make the world a much better place in which to live. Rather than people sitting around trying to stir up troubles and problems for other people, we'd have a world that was sitting around working on the latest greatest project, and trying to devise another new fun event. Until then, get started on your own dream ship. You're going to enjoy it.□

FROM THE SHOP

from page 4

Did I forget to put on enough rubberbands? I can't seem to remember . . .

Ex-Chuckles Cunningham
Ft. Worth, TX

Dear Ex-Chuck(les):

Aha, see how you got punished for chuckling at poor unfortunates like P. Joyner and Al W.

Your plane went boom because you took off with only two #64's holding down that B-I-G top wing. I don't think I'd be stretching the point by mentioning two very valid reasons for that wing not being properly secured:

(1) You're old(er) . . . and it is true that the mind is the very first thing to go; and

(2) Because #1 above is a cold, hard

STATEMENT OF OWNERSHIP
MANAGEMENT AND CIRCULATION
(Act of August 12, 1970: Section 3685
Title 39, United States Code)

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10. Extent and Nature of circulation:

	Average no. copies each issue during preceding 12 mos.	Single issue nearest to filing date.
A. Total no. copies printed (net press run)	96,378	98,541
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	69,437	62,104
2. Mail subscriptions	22,438	22,270
C. Total paid circulation	91,875	84,374
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	700	3,000
E. Total distribution (sum of C & D)	92,575	87,374
F. Copies not distributed		
1. Office use, leftover, unaccounted, spoiled after printed	1,503	7,067
2. Returns from news agents	2,300	4,100
G. Total (sum of E and F — should equal net press run shown in A)	96,378	98,541

I certify that the statements made by me above are correct and complete.

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fact, you forgot that there weren't any rubberbands left to secure the wing with. You see, they'd all been used to hold your column together these past 17 years.

☆ ☆ ☆

This whimsical bit of history was written by Ian Todd in the Maritzburg Model Aircraft Club newsletter, South Africa:

Prop is actually a slang term derived from the full Latin word Propeller, meaning 'that which breaks on landing.' The study of props has been going on for many years, dating back to long before the Wright Brothers. Ancient Greeks were one of the first civilized people to appreciate the importance of props, and it was they who discovered that birds don't use them.

Not much happened in prop development for the next thousand years, until the early 1900s when a pilot by the name of Charles C. Contact discovered that props made convenient handles for hand-starting aircraft engines. This was a big innovation back in the days before electric starters, and pilots throughout the world honored this man by saying his name every time an engine was started.

Early in the 1920s modellers discovered another new use for props --- cutting fingers. Many conservatives at the time predicted that this would be a short-lived fad, however, finger cutting has not only persisted for sixty years, but has actually grown to such widespread popularity that just about every modeller has tried it at least once.

Finally, toward the middle of the twentieth century, man could no longer figure out any more uses for props, so scientists finally gave up and invented the jet!

☆ ☆ ☆

Found in the MACK Turbulent Tissue, newsletter of the Model Association of Central Kansas, Inc., Jim Mowrey, editor, is a list of brand new proverbs:

"Quipsels"

When gas stations start charging for air — that's inflation.

It isn't work unless you'd rather be doing something else.

Fill your water bed with beer and get a foam mattress.

Be a lert — what this country needs is more lerts.

The trick is to be nice to people until you're rich — then people will be nice to you.

☆ ☆ ☆

Answer to the brain twister puzzle:

Andy — P-51; Ed — Spitfire; Harry — J-3; Paul — Corsair; Allen — Waco; Sam — DC-3; Bill — ME-109; Jerry — Pitts; Mike — Starduster.

☆ ☆ ☆

Let's hope it's not going to be a long winter. See you next month. □

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