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RC MODELER

THE WORLDS LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS

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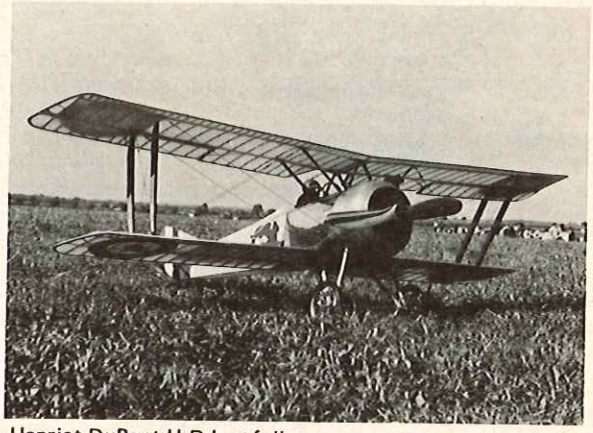
R/C MODELER



Hanriot DuPont H.D.I., a fully vintage WW I Biplane by P. Neate.
See Page 24.

THIS MONTH'S COVER

Sherri Colwell holds Rod and Mark Smith's Standard Class R/C Sailplane, The Windfree, featured on page 18 of this months's issue. Ektachrome transparency taken at Leisure World, California by Chuck Colwell.

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VOLUME 9 NUMBER 6

JUNE 1972

FROM THE SHOP

DON DEWEY

On August 19-20, 1972, the West Jersey Radio Flyers are presenting their World War II "Scramble." This promises to be the largest gathering of R/C WW II aircraft in the world with beautiful trophies and prizes worth over $2,000.00 offered in five events: (1) AMA Scale, (2) AMA Stand-off Scale, (3) Maneuvers, (4) Mission, (5) Combat. The place where the World War II "Scramble" will be held will be the Lakehurst Naval Air Station at Lakehurst, New Jersey. An entry fee of $5.00 will be charged with a $2.00 additional fee for each additional event entered. Time is from 8 A.M. to 5 P.M. on Saturday and Sunday with registration ending at 10 A.M. on both days.

While this promises to be one of the finest events of the year, we would like to present for the consideration of all R/C clubs comtemplating a vintage aircraft meet, the rules for the West Jersey Radio Flyers World War II R/C Aircraft "Scramble."

WEST JERSEY RADIO FLYERS
RULES FOR A WORLD WAR II
R/C AIRCRAFT "SCRAMBLE"

OBJECTIVE:

To encourage the building and flying of R/C models of World War II Aircraft. To foster an interest in, and recreate the spirit of 1939-1945 aviation.

OVERALL REQUIREMENTS:

All models entered in any of the five events must be scale models of specific aircraft built and flown during the period 1939-1945. While minor changes may be made to enhance performance, the general shape and profiles of the prototype aircraft must be maintained. Models not meeting the letter and spirit of the above will be refused registration.

1. *Some proof of authenticity is required.*
2. *Current AMA and FCC licenses are required.*
3. *Entrants are encouraged to submit data and history on their entry's prototype to be read on P.A. during flight.*
4. *May enter the same, or different planes, in each event.*
5. *A two inch per foot scale is suggested as being convenient, but is not mandatory.*
6. *All AMA rules apply unless stated otherwise.*

"BUILDER OF THE MODEL" RULE:

Entrants may fly models which they have not constructed; however, no scale, appearance, or workmanship points will be awarded in the "Scale" and "WW II Maneuvers" events. (Documentation points will be allowed.)

EVENTS:

Contestants fly in order from a single flight-list determined by their order of registration except for "Combat" which will be flown at an announced time. As each contestant is called to the ready area, he will announce which event he is flying for this particular turn ("Scale", "WW II Maneuvers", or "Mission").

The five events of the "Scramble" are as follows:

1. *SCALE: This is based on AMA scale event whose rules and scoring shall apply except for the following listed changes:*
   a. *The following scale operations may be performed: (1) Multi-Engines; (2) Extend & Retract Flap(s); (3) Drop Bomb(s); (4) Smoke Screen; (5) Parachute Drop; (6) Fire Gun(s); (7) Fire Rocket(s); (8) Drop Message or Flare.*
   b. *Scale Flight Plan - - - Contestant may perform any or all of the first eight and last two maneuvers listed for the "World War II Maneuvers" event. All scale operations must be performed consecutively. A maximum of 10 point per maneuver can total 100 points (maximum) flight score.*
   c. *Official Score – Highest Single Flight Points X (Scale Points + Scale Operations).*

NOTE: In arriving at Flight Score, the judges will consider significantly the realism and speed of flight.

2. *STAND-OFF-SCALE: To 1972 AMA Rules*
3. *WORLD WAR II MANEUVERS: This event is based on the AMA pattern event with suitable revisions to be consistent with the capabilities of the majority of 1939-1945 aircraft (maximum 10 points each, sub-total 160).*

   Scale "handicap" points will be added to Flight Score to determine total score.

   Official Score – Highest Single Flight Points + Scale Points / 6

   Maneuvers: (Total time 11 minutes, includes 3 minutes starting time.)
   1. *Unassisted ROG*
   2. *Straight flight (from takeoff or return to above transmitter first)*
   3. *Procedure turn*
   4. *Straight return*
   5. *Wing over*
   6. *Two rolls (straight or barrel)*
   7. *One loop*
   8. *Immelman turn (AMA)*
   9. *Split S (½ roll, ½ loop to upright)*
   10. *Strafing run (low, straight, pass 5 to 30 feet – may be continuous from Split S)*

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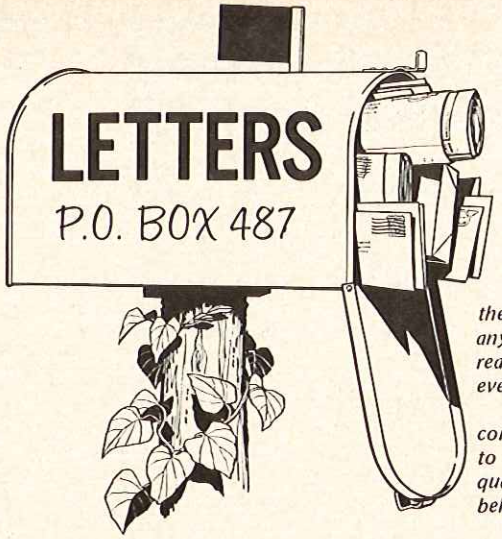


QUARTER MIDGETS . . . .

Sir:

There has been a lot written about my article regarding 1/4 Midget Racing. It seems the proponents do not all want to go the same direction, nor do they all have the same interpretation of 1/4 Midget Racing.

I have some plans from Bob Penko, Mentor Ohio, and they do look like good racing plans. They say that it is legal only to clean up the inside of the engine and presumably free up bearings. This can be done and still keep engines stock. Certainly no one should argue with this interpretation of stock. Their event is a racing event. The planes P-51, Cassutt Racer, P-63, and several Goodyear adaptations are racing planes. Their opinions of the Top Dawg is that it makes a miserable quarter midget compared to theirs.

Guy Oliver, from St. Louis, has defended quarter midgets from another angle. He classifies Top Dawg only as quarter midget. My answer to Guy, (we fly together several times a year and I hope he considers me a friend) is that no way can their Top Dawg races be considered a quarter midget racing event (as the Mentor boys' consider it). He wants the racing to be low key with Top Dawg only. This is fine – I have no quarrel with that . . Those planes can be flown as Sunday planes or anything else.

But . . . who really thinks they would be in the same field as the Mentor type true racing planes? Surely no one who really thinks about it. Now the question is – shall AMA make quarter midget racing an official event? If you have a racing event as an official event then you ask everyone to build a racer to win. You do not expect them to purposely slow down something and lose.

Guy wants a Sunday event as an official event. Ohio, Kentucky and, from those we have heard about, California, want a true racing event. Bob's objection to my article was that the planes I saw were a bad representation and not true racing planes and that I should have seen good planes before I made up my mind.

Guy's objection to my article was that I fly Formula I and II and therefore should be barred from flying Quarter Midget because I would tend to make it too fast. He should also have the same quarrel with Bob Penko since Bob flies true quarter midgets – fast.

Remember this, if it is an AMA event – you ask people to fly – not refuse to let them. For special club events you can limit anyway you see fit. Now, Guy, do you really want this an AMA event open to everyone?

We believe not and we do not believe my comments on quarter midgets even applies to your Top Dawg fun flys. I have no quarrel with them at all – I just do not believe them to be an AMA event.

Also remember, my comments were based on a very unsafe and poor exhibition of so called 1/4 midget racing. From what I saw there I must hold firm to not only mine, but many others opinion – something like that we do not want.

To the proponents – get together on what you want. Do you want Top Dawg Sunday racing – or do your want P-51 Mentor type racing? To pull together, you must be together.

C.W. Reed III
Raytown, Missouri 64133

HEADING FOR FT. RUCKER?

Sir:

I would like to take up a little of your space to invite all of your readers in Army Green who might be coming to Fort Rucker, Alabama, for training to bring their aircraft along. The Commandant of Fort Rucker has granted us permission to use a helicopter stage field on weekends. It's an ideal site, lots of smooth concrete and all around good visibility, but on week days it's loaded with Huey's. But if you're coming here for flight training, you won't have too much time during the week, anyway. Give me a call when you arrive – I'm in the Fort Rucker phone book.

Yours,
Major H.P. Keller, President
Fort Rucker RC Club
Fort Rucker, Alabama

KUDO'S FOR A MAUFACTURER . . .

Sir:

In this day when so many manufacturer's are remote from the user of their products, it is gratifying to know that there remains some who will whole-heartedly stand by their product.

Recently I had difficulty with a radio controlled glider (Malibu) that I had purchased from Astro-Flight, Los Angeles, California.

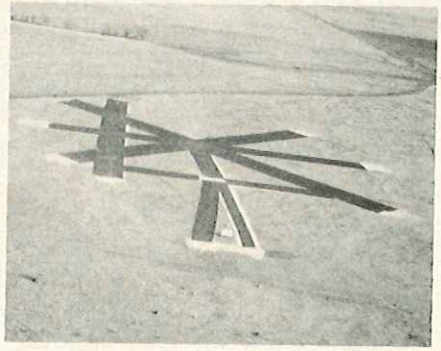
Out of anger and frustration I wrote the manufacurer about the problem, expecting to be neglected. To my surprise, the owner of the firm, Mr. Bucher, phoned from Los Angeles to Elyria, Ohio, and got the problem straightened out with me.

I wanted to tell your readers, in a public way, of the fine, sincere effort of this firm to give 100% satisfaction.

Yours truly,
Richard Benetto
Elyria, Ohio

Feedback

RADIO CONTROL ACTIVITY AND NEWS BRIEFS



INTERNATIONAL AIRPORT? . . .

No, the lead photo for this month's Feedback column isn't an air shot of the International Airport! But, possibly a flying site, suitable for such activities as the 1973 World Championship Team Finals.

The site is a level 36 acres, located adjacent to approximately another 3,000 acres of various selected community recreation activities. At this time the site has four surfaced runways, each 400' long and 30' wide, with taxiways and pit areas also surfaced. These facilities are available to the general public. Development plans for the flying site call for a storage building, flush type toilets, running water and picnic tables. This area has been totally set up using AMA guidelines as primary objectives.

A dream come true. But only with the coordination of the Ned Houk Memorial Park Board and the City of Clovis, New Mexico and the Clovis Model Airplane Drivers Society (MADS). The Ned Houk Memorial Park is now happening, and happening with something for everyone! Future development plans for the park call for a large lake that will, in turn, provide boating and fishing, a Boy Scout Camping area, 18 hole golf course, picnic areas, field trial area and riding stables. The park now contains an archery range, firing range and the model airplane area.

The Ned Houk Memorial Park is located north of the city of Clovis, New Mexico, just off State Route 18, a short 10 miles from the heart of the city. Occasional antelope can be observed grazing with the local livestock.

January 19, 1972, saw 22 contestants gathered at the new Clovis MADS flying site for a day of Quarter Midget and Open Pylon racing. Contestants gathered from Amarillo, Texas; Hobbes, New Mexico; Albuquerque, New Mexico; and Plainview, Texas, and everyone enjoyed the contest even though the wind exceeded 37 mph during the last of the heats of Open Pylon.

M.A.C.S.

"The largest model and craft show in the nation." That's the title the First Annual Model and Craft show 1971 earned for its first year effort. MACS '71, held at the Anaheim Convention Center, Anaheim, California, had some 200 exhibitor booths featuring radio controlled planes, cars, boats, railroads and crafts of every description.

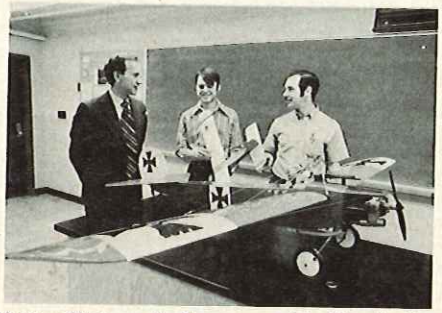
This year's show promises to be even bigger. Exhibitor booth registration and public attendance is expected to double that of last year. Because of the anticipated increase in attendance, the Model and Craft Show's Board of Directors have decided to extend MACS '72 to three days, June 23, 24, and 25, including Friday and Saturday evenings until 9:00 p.m.

Inside the Convention Center Exhibition Hall there will be static displays of all models, plus crafts, such as Macrame, Weaving, Jewelry making and just about everything else imaginable in the model and craft fields. There will also be continuous outdoor demonstrations of radio controlled planes, cars and boats, plus rockets and U-control planes for all three days.

In addition to all the displays and demonstrations, awards will be given to winners in many contests which are open to the public. Bring your latest creation; you may be a winner. All entries must be in Friday, June 23, 8:00 a.m.

As you can see, there will be something for everyone, so be sure to bring the entire family to MACS '72.

MACS '72 show hours are: Friday, June 23, 10:00-2:00 (Dealers only, no general admission). For the General Public, Friday, 2:00 p.m.—9:00 p.m., Saturday, 11:00 a.m.-9:00 p.m., Sunday, 11:00 a.m.-6:00 p.m. Discount tickets are available at your local hobby and craft shops. For further information, please call (714) 534-0420 or (714) 531-4787.



New officers of Tennessee Tech's Radio Control Club are, from left, vice-president Keith R. Clark, a design engineer with Keene Corporation; president Walter Dooley, a sophomore at Tech; and secretary-treasurer, John A. Byrne, supervisor of maintenance at McCord Corporation.

New Club Is Off To Flying Start

Tennessee Tech's new Radio Control Club is off to a flying start, literally, says Tech's Dr. Elmo Dooley who helped get it off the ground last fall.

Dooley, who engineered the "Cosmouse" flight two years ago, said the club "has made a great deal of progress" since its formation, and that the group was looking for new members.

"Membership is open to any member of the community, or any citizen of Putnam County, who is interested in designing, building or operating radio-controlled planes, cars, or boats," he said.

Since last fall, the RC Club has been chartered by the Academy of Model Aeronautics of the National Aeronautics Association. Tech is one of only three universities in the country with an AMA-chartered radio control club. The others are Penn State and Texas A & M.

Among the first-year accomplishments of the club, said Dooley, are its new charter and constitution, an expanded membership to 25, an FCC license for the operation of radio control equipment issued to the club, a visit by AMA Vice-President Frank Schwartz, and plans presented to the University for the development of a radio control flying site on the Tech Farm.

Calling the club a "unique" organization, Dooley said its makeup was "50 per cent Tech and 50 per cent community working together effectively."

Dooley said new members automatically must belong to the AMA, which gives them license to fly in any sanctioned event, a $300,000 insurance policy to cover bodily injury and property damage, and a monthly magazine.

Officers for this year include: Walter Dooley, president; Keith Clark, vice-president; and John Byrne, secretary-treasurer. Mr. Hoyle Lawson, Tech's Dean of Admissions and Records, alternates with Dooley as Faculty Adviser.

Information concerning the club can be obtained by writing to: Tennessee Tech Radio Control Club, Box 5136, Tennessee Tech, Cookeville, Tenn. 38501. Monthly meetings are held on the third Thursday at 6 p.m. in Room 205 in Pennebaker Hall on campus. Dooley said meetings are open to visitors.

Gene Fuller and Scientific 'Coronet', a 46" span, Class A ship. FF/RC Model uses Heath radio and O.S. .10. Evidence of other models being built in Woody Woodman's basement.

Second Annual FF/RC Meet

The North Jersey R/C Club will soon be hosting the Second Annual East Coast Championship Meet for Old Time Free Flight Models designed prior to December 1941, with modern radio gear installed in them. The Meet will be held at Lakehurst Naval Air Station, Lakehurst, New Jersey, July 1st and 2nd. Two days of additonal flying will be available at a nearby site for those who can stay on July 3rd and 4th. Competition will only be on the 1st and 2nd, however.

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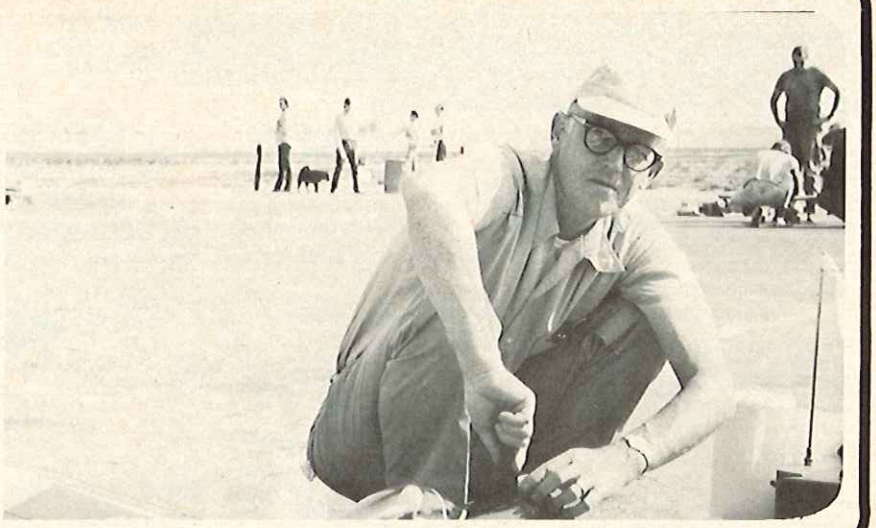
engine clinic

By Clarence Lee



In the February column we made some comments about the difficulty in measuring the sound level of our engines when equipped with mufflers and asked that anyone who might have a solution to write in and let us know. Several letters were received discussing the problem but none that could come up with a simple positive solution that could be used at the flying field. The following letter sent in by Jim Stocke does detail the problem we are facing. I felt it would be of interest to those of you out there who are working with the noise problem. Let's face it, the use of mufflers is going to be universal within the next few years whether we like it or not if we are to retain our flying sites. Some means of determining sound level is going to have to be developed. Jim mentions the two best test instruments are our own two ears. However, this is where we come up short in evaluating model engine noise level. It is not only the noise level but the monotonous drone that gets to people. The sound that may not bother one person may drive another up the wall. As far as I can see, the only answer is total silence. We are a long way from achieving this with our present technology. But who knows what will be developed in the future? Who thought proportional radios would be advanced as they are just a few years ago?

Dear Clarence,

This letter is in response to your plea in the February issue of RCM concerning sound level measurements for model engines. I have been an avid RC modeler for five years and have been modeling most of my life.

I am an engineer at the Noise and Vibration Laboratory at General Motors Proving Ground in Milford, Michigan. (I have written to you once before concerning nylon propellers). Much of my own work is in component durability and development but I have done some acoustic (noise) work. I have also drawn upon the experience of some of our acoustic engineers to determine what are good methods of noise measurements on model airplane engines.

The basic problem we have on model engines in not loudness of exhaust noise but is the tone or frequency of the noise. The frequency of the sound emitted by the engines is annoying to the human ear even when its level is not very loud. Ordinary conversation can be carried on even when several models are flying. The ambient noise level is quite low. The mufflers we use now tend more to lower the predominant frequencies rather than reduce the overall level. Lower frequencies are not nearly as objectionable as higher ones.

Proper use of sound level instrumentation can, however, give a fairly good objective measurement of sound as related to annoyance to the human ear. All measurements should be made in dbA. The "A" scale refers to how the meter "hears" the sound. By using dbA rather than db you get much closer to the response of the human ear. Care must also be taken to be out of the "near field", that is, you must be a distance of more than 2 wave lengths of the lowest frequency of the sound source. On model engines, 20 to 25 feet should be okay. The sound source may also be highly directional. Widely varying the availablity of an anechoic (quiet) room, directionability is difficult to measure. Again, however, reasonable readings can be obtained if you experiment and take readings at many locations.

As you explained in your article, sometimes the muffler which had a higher level reading on the ground seems lower in the air. Most likely, this is due to the power loading on the engine. Under load, the engine can change the level and frequency of the emitted noise. It would be relatively simple to build a loading device to simulate on the ground the noise the engine makes when under flying load.

Perhaps the best way to measure which muffler does the best job of noise reduction is to make a sound power measurement. The greater the power, the louder the noise (this is done on the "A" scale also). Power measurements can be made outdoors by taking several measurements at a fixed distance from the noise source. Geometrically a hemisphere of readings would be formed around the noise source. It is much easier to make a power measurement in a reverberation room which is designed for this prupose.

In the final analysis, the two best instruments made are our own two ears. At our lab, interior noise levels of cars are recorded, then played back to a "jury" of five people who rate the noise on a scale of 1 to 10, i.e. least to most objectionable.

There has been very great interest in noise pollution as of late. Government regulations are inevitable. General Motors is spending millions of dollars to reduce the noise of cars and trucks. Model engine manufacturers will become involved in noise reduction if the industry is to survive.

Sound is an elusive and difficult thing to understand and measure. I hope I have helped you with some of its subtleties. Do not hesitate to request more details on anything related to noise. I will be more than happy to assist in any way I can.

Sincerely,
James E. Stocke
Ann Arbor, Michigan

Dear Clarence,

Some of us have to learn things the hard way. I did, and will never fly anyplace but the basin again. Some time ago, I got fed up with the dirty basin, tractors, etc., and flew someplace else. Very confined quarters make you stay on your toes! All went well 'till some wise guy drove his truck down my runway on my landing approach. I had to abort and was nervous, and hit a telephone pole. Imagine, some guys actually think the streets are meant for cars and not airplanes! Come to think of it, they are!

My equipment seems okay, but the plane was demolished. Se la vi! The engine filled with dirt. So, I cleaned it after disassembling it. It is a Webra .61 and I found it has no head gasket but seals like a K & B racing engine. Should I seat the head with Bon Ami?

The radio seems okay, all I can do is vibration test it extensively, and pray. Because of this, and the fact I will be rusty, I will have enough problems the first time out adjusting my new plane's retracts and trimming it. So, I was wondering if I could set my engine on the ground with a tach. Is it possible to run it up to top and back off a certain number of R.P.M. and get a good setting? The point is, that I am very conservative, and would rather be rich than lean, but would like to be close to right on the first flight so I can concentrate on trimming out the plane and getting it back in one piece. For some reason, I can never tell if my engine is set right on the ground. I simply make sure it is a little rich and lean it in a few clicks the next flight 'till it is

ENGINE CLINIC

burbling at the bottom of loops like it is supposed to. To make matters worse, my new plane will be designed for a muffler, and I have only flown a little with a muffler. So, I think you can see my point. Question, for some reason, my engine always seemed to run rich the first flight. If I left the needle valve where it was last time I flew, it would always run rich 'till the second flight. Can you explain this? Otherwise the engine is perfect in every way. Fox plug, 12% nitro and 22% Klotz.

Thank you,
Lee Goldstein
Calabasas, California

The Webra .61 does not use a head gasket and, as far as I know, there has never been any problem with leakage. Lapping with Bon Ami will not hurt anything but should not be necessary unless leakage is detected – dark spots on the seating surface of the head or sleeve.

Frankly, Lee, setting the engine on the ground with a tachometer is not too practical. Many fellows have given this a try but you still have to have an ear tuned for sound in the air. Some engines will go rich in the air and others lean depending on tank position, fuel, etc. You have to be able to detect how the engine is running in the air before you can set it by tach on the ground. Just because you peak the engine on the ground and back it up on the rich side three or four hundred rpm does not mean this is the way it will run in the air. If you finally determine the correct setting in the air by the engine burbling at the bottom of loops and in long dives, tach the engine on the ground, and then always set it for this rpm, you will be close. However, temperature and humidity also play a big part. Some days the engine will require richening up more and other days less. i.e. in warm humid weather you will have to set the engine off richer, and in cooler dry weather leaner. Developing an ear for the right setting is something that will come with experience.

Your engine always being rich on the first flight is a bit of a puzzle. It is more normal for the engine to be lean on the first flight due to congealed oil in the fuel lines and carburetor. About the only thing I can think of that might make it rich on the first flight would be leaving fuel in the tank from the previous flying session. The alcohol and nitromethane evaporate, leaving the oil. Your first tank of fuel is then overly heavy with oil resulting in the rich setting.

Dear Mr. Lee,

I have an OS Max .35 R/C mounted in my H–Ray. Approximately a gallon of K&B 100 has been run through it. The engine has been fitted with an O.S. Jetstream Silencer. I use a DuBro Sintered tank filter. The tank CG is about an inch below the needle valve centerline.

I've been using the model for training purposes. In this manner, good flights can be had at part throttle or the airplane will "balloon". Consequently, the majority of all flying is at part throttle.

Flying in the Summer and Fall has been without problem. Winter flying has been difficult, though. At temperatures of 35°F and below, the engine quits after a minute or two in the air. On the ground, I can run a full tank with the glow plug battery connected.

The engine starts quickly with my Sonic Tronics starter, idles well and will 4-cycle. However, there is a relatively narrow top end 2-cycle range. I've got about 4 clicks between 4-cycle and shut-off. There is a very slight RPM drop-off when I disconnect the glow plug battery.

One of my earlier flights in the Summer ended in a crash that bent the exterior threaded portion of the needle valve. The locking nut that secures this thread to the carb. body also became loose. I partially straightened it by hand and reassembled the needle valve to the carburetor. However, I'm not sure if I have located it properly. The stem is still bent about 2 degrees.

My questions are simply:

1. *What do I do to correct my flame-out problem?*
2. *Shall I replace the needle valve assembly?*
3. *Shall I replace the whole carburetor?*

Sincerely,
Mort Nashman
Somerset, N.J.

A very narrow two cycle range usually indicates either a new engine that is overheating or one that is worn out and no longer has a good compression seal. As your engine performed satisfactorily in the past I would guess your problem is the latter. You did not say under what conditions you have been running the engine, but if from a dirt field, or being a beginner, possibly landing in the dirt many times without thoroughly cleaning the engine afterwards, has resulted in your engine being worn out without too much running time. A worn out engine is also difficult to start, but by using the electric starter you haven't had to face the problem. A worn out engine, in turn, will lack good fuel draw and result in the engine stopping in the air. Also, with a very narrow two cycle range, it is possible, if you get off slightly lean, for the engine to unload, picking up rpm in the air and simply pass through the two cycle range and stop the same as leaning the needle valve in too far on the ground.

As for the bent needle valve – this should not hurt the performance of the engine. The crash that bent the needle valve may also have been the one that got dirt into the engine as mentioned above. The correct position of the spray bar is with the end on the center line of the venturi or slightly short of it. Do not extend the spray bar past the center line. Actually this is not critical.

Dear Mr. Lee,

I have an O.S. Max .35 R/C engine which, over this past summer, has caused some problems which I am unable to rectify. This engine is almost two years old and lately has developed a very poor idle. I have the idle speed adjustment completely loose, however it still idles too fast, also when you open the throttle for takeoff, after it has been idling for a minute or two, it will usually stall. On final, unless you feed in a little throttle slowly, it will sometimes quit. This engine is operated without a muffler, but with an exhaust plate and glow plug with idle bar. I have been using home brew 5% nitro, mixed with Cox fuel (Blue Container) in an effort to increase the nitro content to obtain better idle and acceleration. I might mention that I used nothing but home brew the first summer of operation without any ill effects. I have tried adjusting the small mixture screw but haven't noticed any improvement. This engine has never been taken apart since new, only cleaned externally to remove varnish, etc.

Sincerely,
Derek Hudson
Goose Bay, Labrador,
Canada

A lot of idle problems are caused by 'home brew' fuel. However, if you have had satisfactory results in the past I would guess your engine, like the one in the previous letter, is getting tired. One of the first indications of an engine going over the hill is loss of idle. This is followed by difficult starting and, finally, inability to hold a needle setting in the air. The engine leans out more towards the end of the tank than it used to, etc. A tired engine has less combustion pressure which means a little less heat. The glow plug, in turn, is not quite as hot at idle and the fire goes out on acceleration as the baffle opens. The best thing to do is have the engine overhauled.

As for adding Cox blue can fuel to your 'home brew', this is okay, the only thing being that Cox itself is only 15%. A 50-50 mix of your fuel and Cox would still only increase the nitro content to 10%. This would be adequate but I doubt if you are adding this much Cox. If you are going to spike your fuel use something hotter than blue can. Cox racing fuel which is 30%, Supersonic 1000, or even Fox 40-40.

Dear Mr. Lee:

I have recently encountered a problem with a Perry carburetor for an O.S. Max .60 Golden Head engine. The Perry carburetor is the "Seventy Model". The engine was being operated with a ten-ounce tank, the center line of which is located approximately 3/8ths of an inch below the needle valve of the carburetor; the tank is not an unusual distance behind the engine. The instructions suggested opening the needle valve one full turn; however, I found that the needle valve had to be opened so many turns that the needle practically came out. In fact, I had to put a nut between the head of the needle and the spring so that the spring would hold tight enough. The reason the needle valve had to opened this far was the extreme leanness of the engine which would quit if it was put in a nose up position. When the plane was flown, the engine immediately flooded out when flown inverted.

I had been using a very narrow bore tubing between the tank and the carburetor, and I found that by using a wider bore tubing the problem was considerably overcome, i.e. I could screw the needle valve in further and the engine, while it richened up when the plane was inverted, did not quit. I still could not screw the needle valve in to anywhere near one turn open, and I still needed the nut in order to keep the spring

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SUNDAY FLIER

KEN WILLARD

Okay, fella's. In response to what is virtually an avalanche of requests, here is another photo of what many of you have written in to say, "That's the best looking model yet!" Naturally, I agree with you – even when you clarify your comment and say, "And the airplane ain't bad looking, either!"

So here's Helen Lam, your favorite model, once again with the Wavemaster, my favorite R/C power plane. Incidentally, when I took the pictures, I took three shots before I noticed that I hadn't removed the lenscap! Would you believe that they came out fine, anyway?

Some of you may notice that the Wavemaster has a nylon prop – and a lot of modelers shy away from them when using anything larger than a .35. But when you fly off water and, particularly, when you are testing the water characteristics, a lot of spray unavoidably gets up into the propeller disk. Wooden props get the leading edges of the blades all chewed up by this spray, and this doesn't happen with nylon props. I've heard, of course, of failures with nylon props (I've also heard, but not as frequently of wooden prop failures) and to minimize the possibility, I always boil the nylon props for about forty minutes before using, since I'm told this removes the molding stresses. Lastly, and it doesn't matter whether you are using wooden or nylon props – stay out of the plane of rotation! At least as much as operating requirements permit, and especially as much as possible when "tweaking" the needle valve for maximum power. And you can avoid it entirely if it bothers you too much; just take up soaring.

★ ★ ★ ★ ★

In the April issue I described some tests that I made with my TopSailer, using various wings with different airfoils. I closed by saying "more next month." Then, as you all know, the Northwest R/C Symposium came along, and I covered it last month. So now let me get back to the business of wing tests. Especially since I've received a couple of letters (and probably some of you felt like writing, but didn't) which asked, "What do those wing sections look like. Well, due to an oversight, those sections weren't printed in the April issue, so here they are.

An intriguing idea – variable camber airfoils – is now possible, and is being used experimentally. I have a racing wing for the TopSailer which I am testing and which shows promise. With a span of eight feet, and a chord of ten inches, it has "flaperons" that comprise three inches of the ten inch chord. These full span surfaces can be moved up and down together, to act as flaps, or separately in opposite directions to serve as ailerons. For high speed, they can be trailed in a slightly up position to give virtually a symmetrical section; then for light wind conditions, when added lift is needed, they can be lowered to give an undercambered airfoil – sort of a rough NACA 6710 section, which has high lift – but also a correspondingly high drag which slows the model down. Even so, it's better to fly slow and stay airborne, than make a fast descent to the bottom of the hill. Y'gotta' finish the course to win . . . or place, whatever the case may be.

The system which I am using is merely an adaptation of the sliding servo which Ron Neal uses in the Gryphon flying wing for his "elevons." It is essential, though, that the track in which the servo slides is snug, yet doesn't bind. If it binds, the combination of friction plus air load will get you in trouble right now. And, if it isn't snug, then you have two potential problems; sloppy linkages, which will result in flutter at high speed, or alternatively, the tray holding the sliding servo can get slightly askew, like a bureau drawer, and suddenly freeze in one position. I saw that happen just yesterday out on the slope when a fellow modeler totaled his Gryphon due to a stuck sliding servo. Don't let it happen to you.

The variable camber wing can also be an advantage in thermal soaring. When you get to the end of the winch tow, or drop off from the Hi-Start, as the case may be, you can position the "flaperons" in the trail position and proceed at high speed, low drag while you hunt for a rising current; then, when you encounter one, you drop the flaperons into the high lift angle, which also slows the model down, and lets you circle in the thermal. Finally, when you come in to land, you can drop the flaps all the way down for precision landing. It all sounds great, doesn't it? And it is – but don't be misled – it takes practice – and a lot of it, to get maximum use of the flaperon capability.

And so, the never ending bull sessions on airfoils, sink rates, lift/drag ratios, and all

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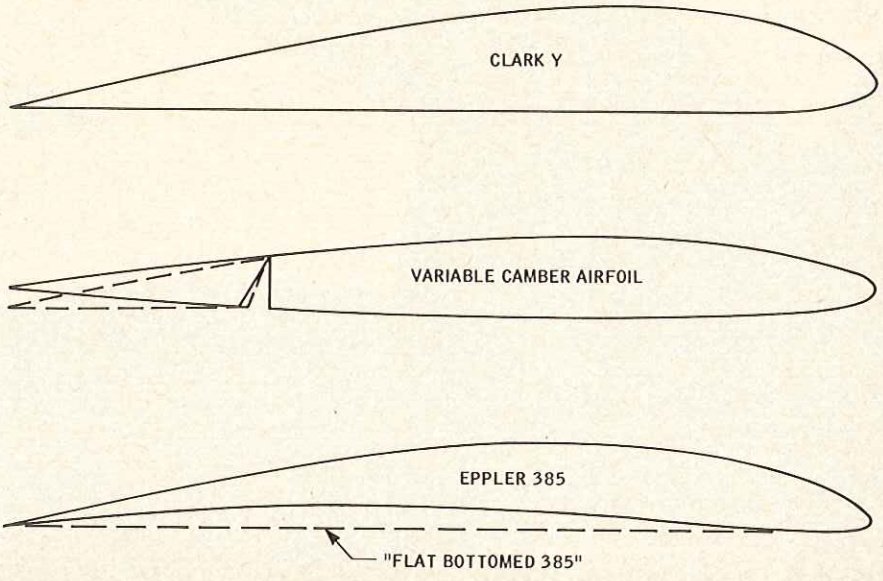
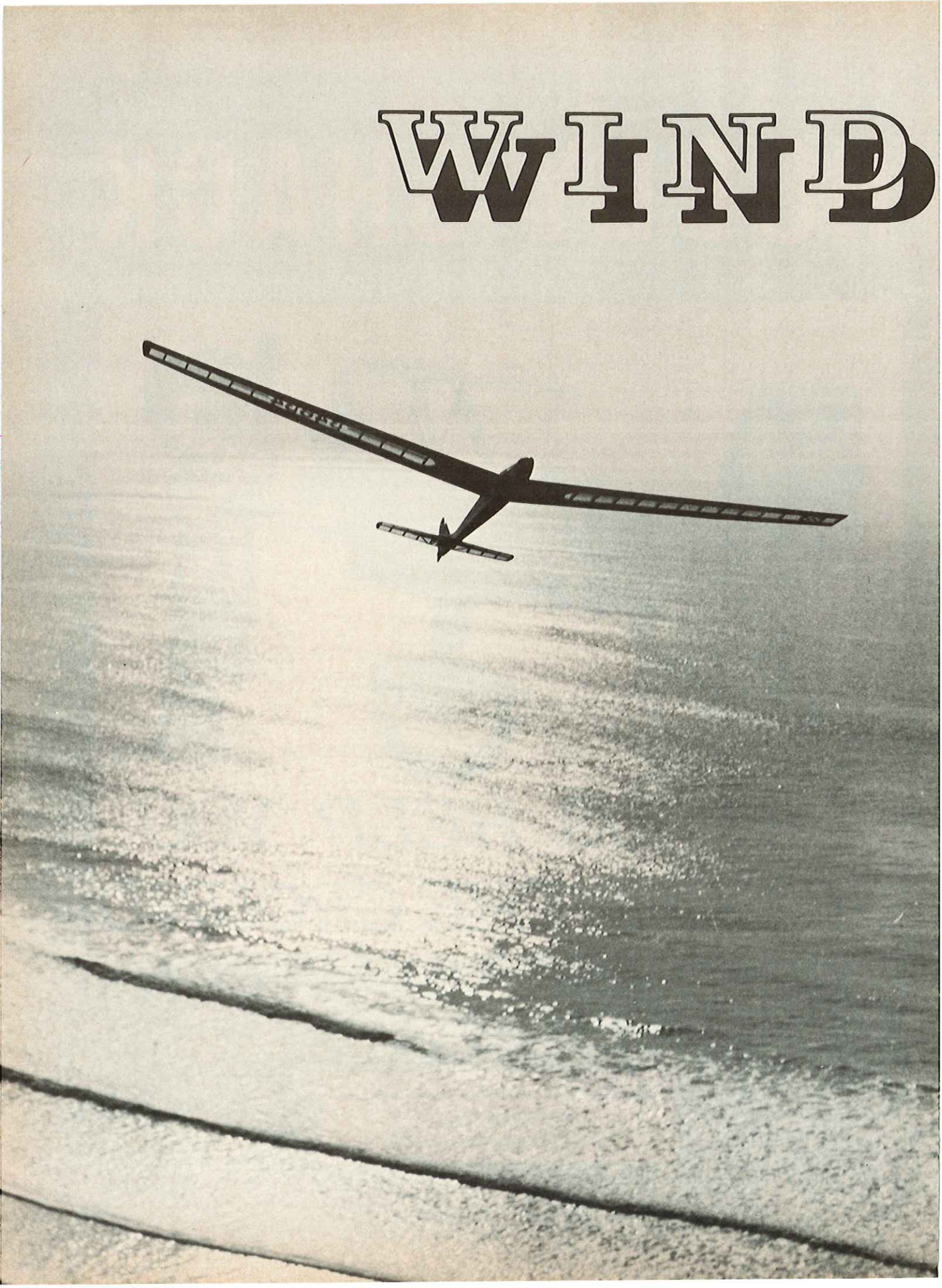


WIND



FREE

BY ROD AND MARK SMITH

INTRODUCTION

The Windfree has been successfully flown in competition against all types of R/C sailplanes. With this sailplane the expert can win contests or the flier who has reached the intermediate level of R/C soaring ability can practice the finer points of the art.

Construction of the airframe is conventional, since all materials are standard size and readily available. Even the canopy can be replaced with materials available at your hobby shop. The attachment of the wings and stabilizer to the fuselage is solid and simple with no grommets, hooks or rubber bands to wear, shift or fail at the crucial moment.

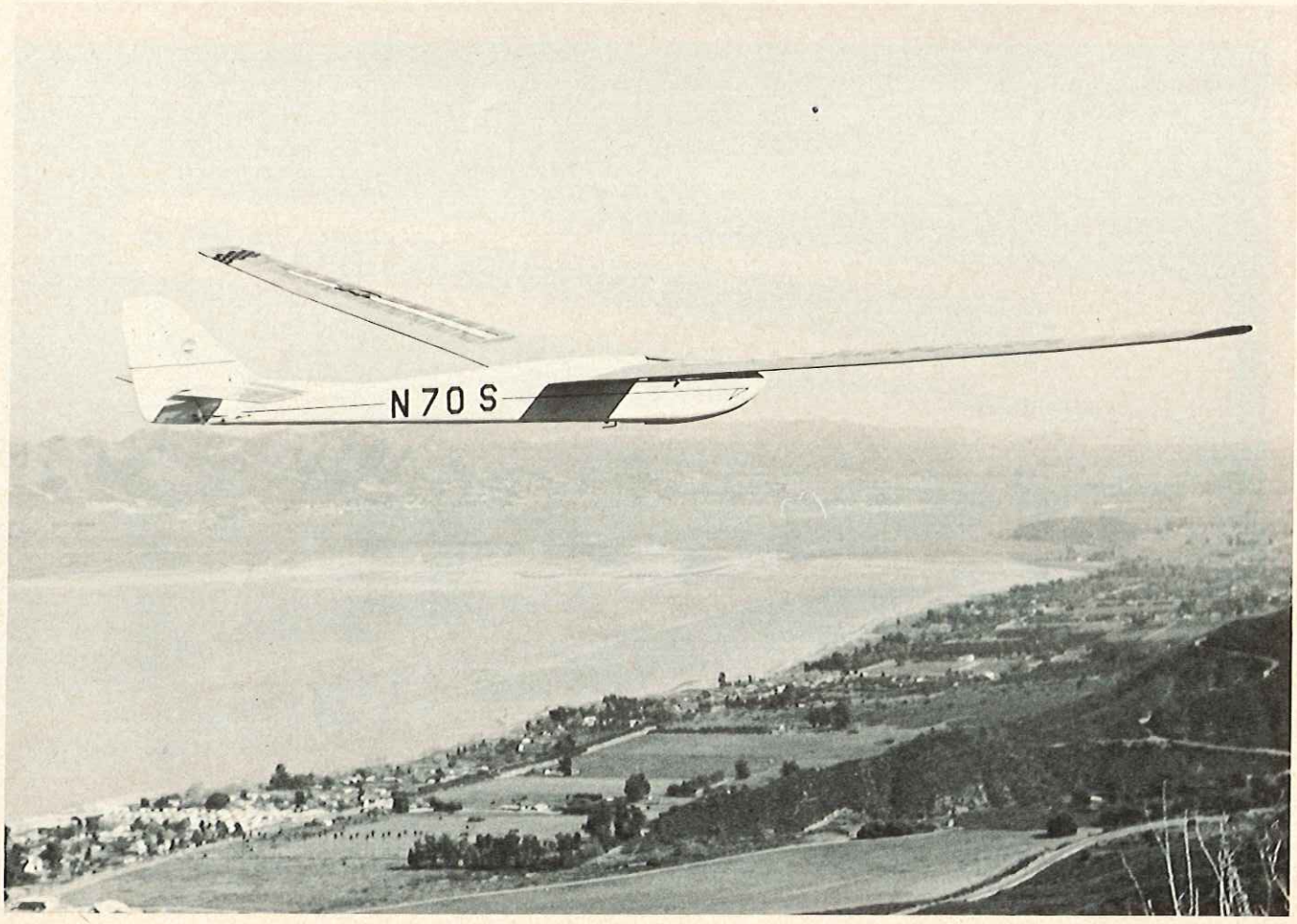
WING CONSTRUCTION

(1) Prepare a flat work surface five feet long and at least one foot wide. Use a material that will not bend or warp and one in which pins can be inserted. The completed wing will only be as straight as the surface on which it is built. Cut the drawing of the right wing panel from the plans and tape it to the work surface. Tape a sheet of wax paper over the plans.

(2) In the following text the term cement will be used to designate Ambroid and the term glue will designate Titebond. Cement the 1/16" x 2" balsa sheets together to form the leading and trailing edges. Pin these sheets over the plan so there will not be a gap at the 45° butt joints. Cut a doubler from 1/16" sheet scrap, as shown on the plans and glue in place. Be sure the glue does not get in the area of the ¼" x ¼" leading edge or the 3/32" x 1/4" spar.

(3) Pin and glue the 3/32" x 1/4" bottom spruce spar in place over the 1/16" x 2" leading edge sheet. Note that the spar stops at rib # 12. Clean off any excess glue that is squeezed out of the joints. Shim the rear bottom spar 1/16" above the work surface and pin in place.

(4) Cut out, then glue and pin the ribs in place. Make sure to cut the spar slots slightly oversize to assure that the ribs will be down tight on the leading and trailing edge sheets and not perched on top of the spar. Push the ribs as far forward as they will go. Align the front of the ribs with a straight edge.



(5) Cement and pin the ¼" x ¼" leading edge in place.

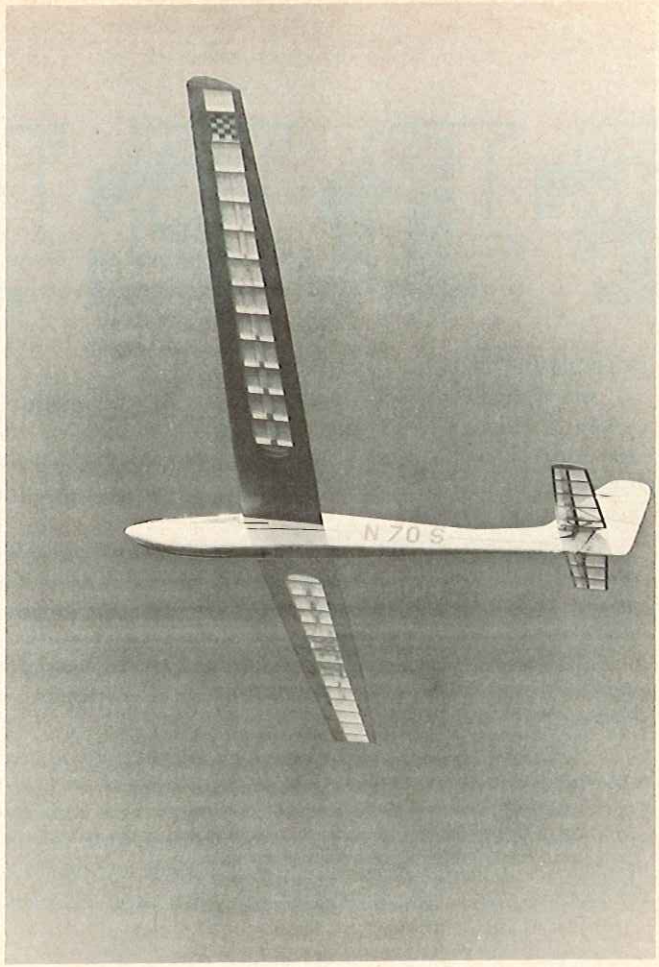
(6) Glue the top spars in place; splice the front spar as shown on the plan. Be sure to use Titebond glue. Do not use excessive glue at ribs 1, 2, or 3. These ribs are drilled out later to permit the 3/16" diameter brass tube to be installed. Excessive glue will make this job more difficult.

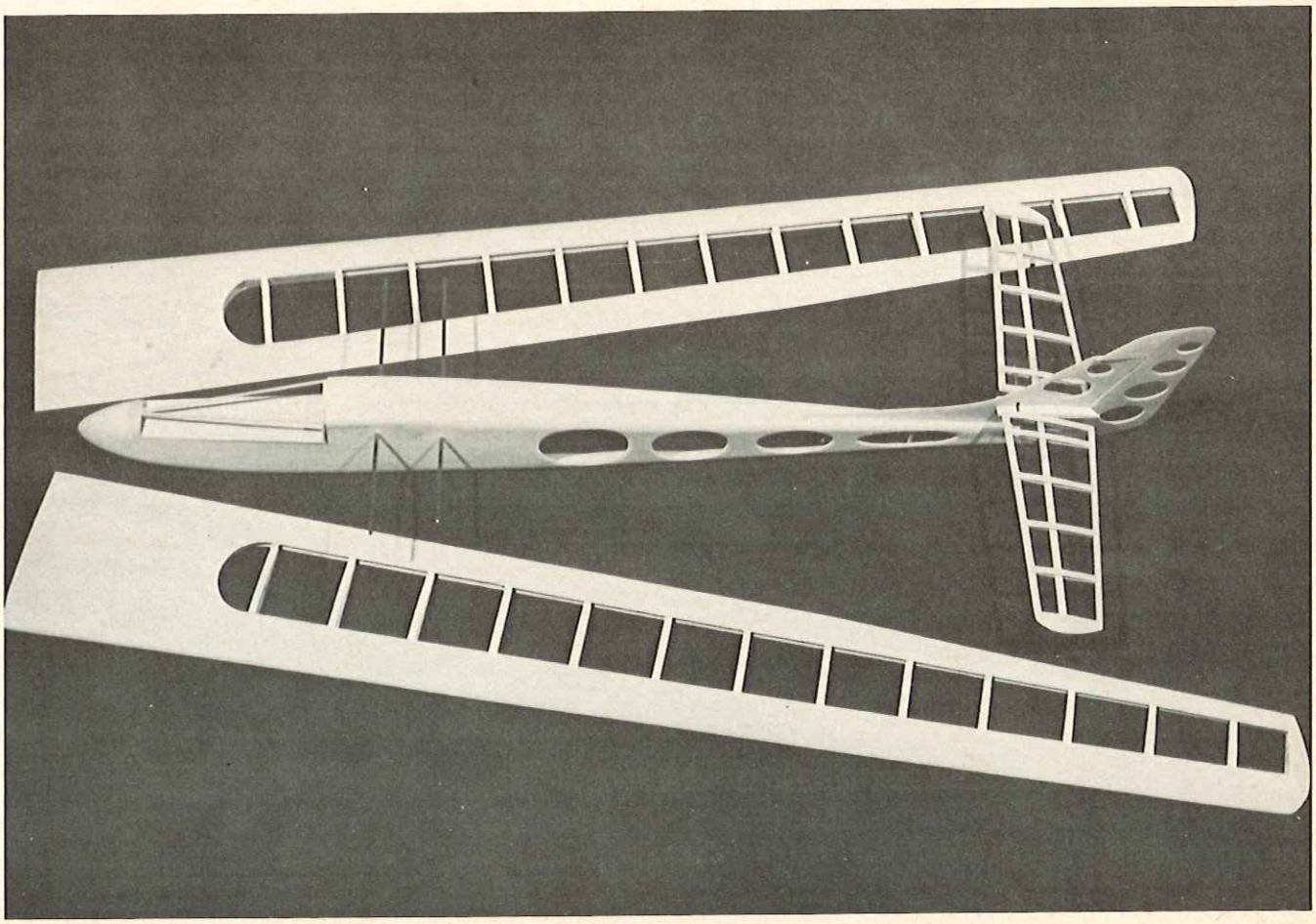
(7) Glue and pin the 1/16" sheet front shear webs in place on both front and rear spars. Do **not** *enclose the spar completely by installing the rear shear webs. Glue the 1/16" sheet scrap trailing edge stiffner in place. Let the assembly dry for at least eight hours.*

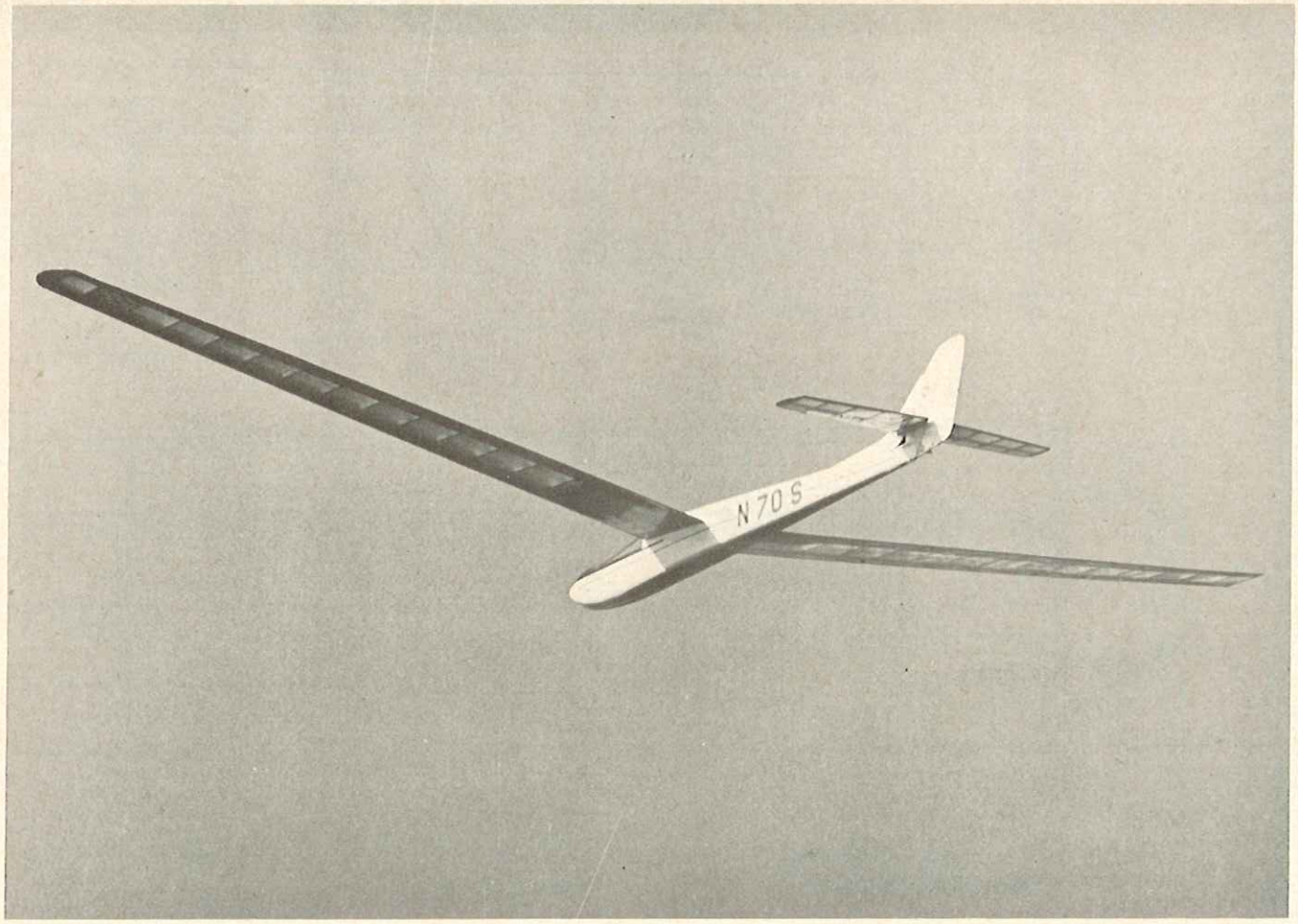
(8) After the assembly has dried, trim off the excess shear web material that projects above the top spar. Cut the leading and trailing edge sheets to the proper outline. The best way to mark the trim lines on the wing trailing edge, is to extend the wing outline on the plans with a pencil and straight edge. When the assembly is in place over the plan, you can then align the straight edge with the extended lines and draw the trim line on the wood. A good metal straight edge, or "yard stick", may be purchased at the hardware store for about one dollar. This tool is useful when working with large wings.

(9) Glue a 1/16" scrap sheet splice doubler to the 1/16" x 2" top leading and trailing edge sheets. Be sure the doubler is on the proper side of the sheet. Wipe off any excess glue. Excess, dried glue will prevent the mating sheet from forming a tight joint.

(10) Remove the wing assembly from the plan and sand







the ¼" x ¼" leading edge and the 1/16" x 2" trailing edge so that they fair into the curve of the ribs. Don't slant the top of the leading edge so much that when you cement on the 1/16" x 2" top leading edge sheet, the sheet will not bend over the leading edge and the ribs. Use a sanding block that is at least ¾" x 2" x 9".

(11) Apply a fillet of glue to all of the joints except where the ribs (R2-1, R2-2) contact the top spars. Use a glue gun for this operation. Be sure to put large fillets inside the wing spar.

(12) Pin the assembly to the work surface and coat the top of the front spar, leading edge and the top of all the ribs where the 1/16" x 2" leading edge sheet contacts them, with glue. Pin the 1/16" x 2" leading edge sheet in place. If you wet the sheet on its upper surface it will bend easier but then the wing will have a nice spanwise elliptical warp when the sheet dries. This won't hurt the performance of the sailplane and your friends will wonder how you got the fancy elliptical dihedral. Don't tell them! Just be sure you wet the leading edge sheet when you build the left wing panel. Also, be sure to clean off any excess glue that is squeezed out of the joint between the top spar and the 1/16" x 2" leading edge sheet.

(13) Glue and pin the 1/16" x 2" trailing edge sheet in place.

(14) Let the wing panel dry for several hours. Don't remove the pins until the glue has really dried.

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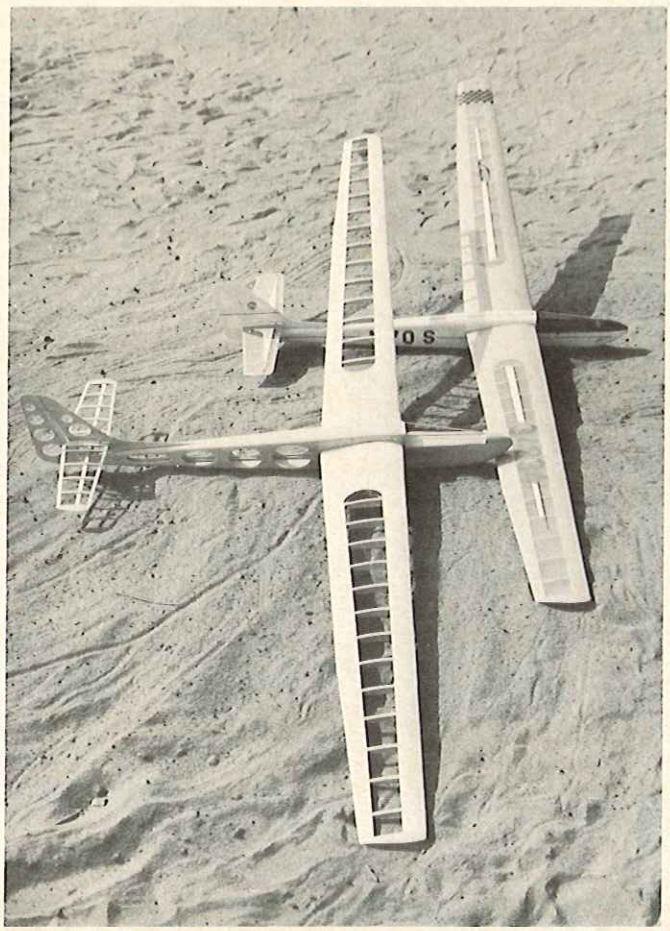
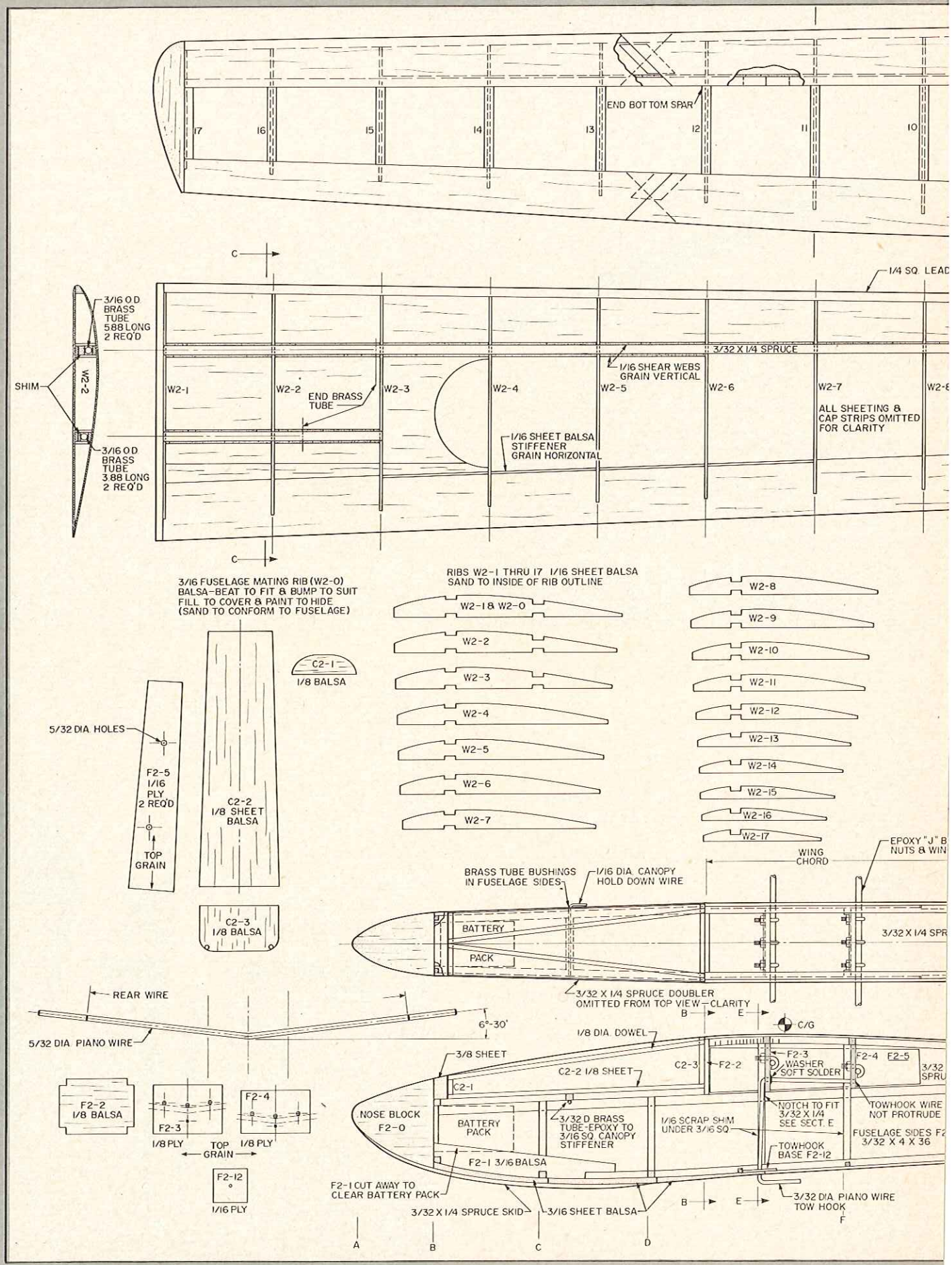
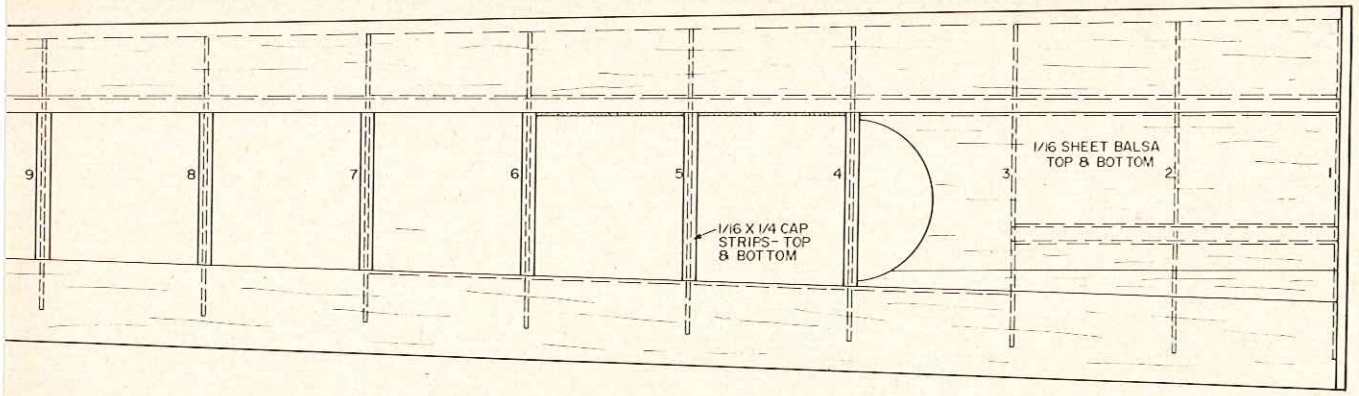
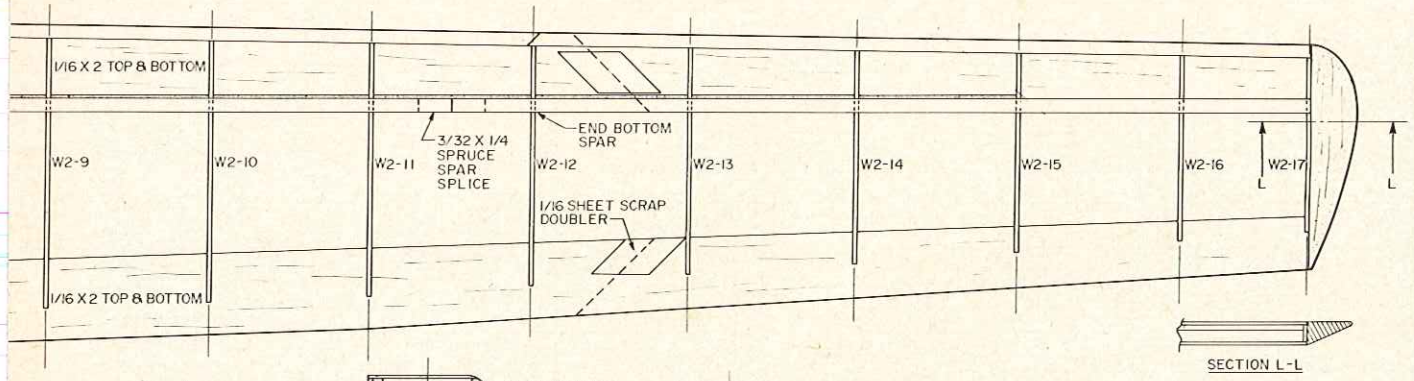
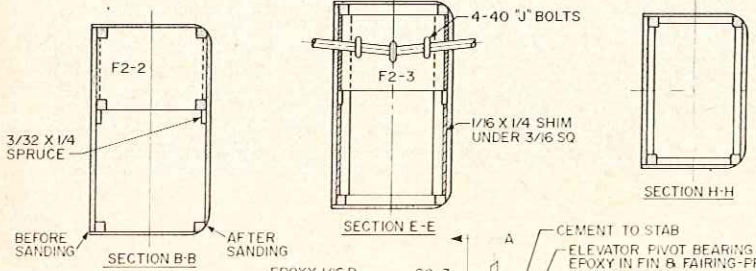


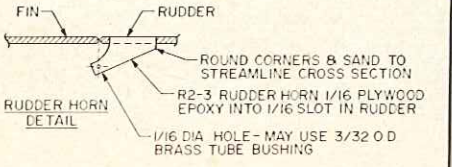

17
16
15
14
13
12
11
10
END BOTTOM SPAR
C
1/4 SQ. LEAD
3/16 O.D. BRASS TUBE 5.88 LONG 2 REQ'D
SHIM
W2-2
3/16 O.D. BRASS TUBE 3.88 LONG 2 REQ'D
W2-1
W2-2
END BRASS TUBE
W2-3
W2-4
W2-5
W2-6
W2-7
3/32 X 1/4 SPRUCE
1/16 SHEAR WEBS GRAIN VERTICAL
1/16 SHEET BALSA STIFFENER GRAIN HORIZONTAL
ALL SHEETING & CAP STRIPS OMITTED FOR CLARITY
3/16 FUSELAGE MATING RIB (W2-0) BALSA-BEAT TO FIT & BUMP TO SUIT FILL TO COVER & PAINT TO HIDE (SAND TO CONFORM TO FUSELAGE)
RIBS W2-1 THRU 17 1/16 SHEET BALSA SAND TO INSIDE OF RIB OUTLINE
W2-1 & W2-0
W2-8
W2-9
W2-10
W2-11
W2-12
W2-13
W2-14
W2-15
W2-16
W2-17
C2-1
1/8 BALSA
5/32 DIA. HOLES
F2-5 1/16 PLY 2 REQ'D
TOP GRAIN
C2-2 1/8 SHEET BALSA
C2-3 1/8 BALSA
BRASS TUBE BUSHINGS IN FUSELAGE SIDES
1/16 DIA. CANOPY HOLD DOWN WIRE
WING CHORD
EPOXY "J" B
NUTS & WIN
BATTERY PACK
3/32 X 1/4 SPR
3/32 X 1/4 SPRUCE DOUBLER OMITTED FROM TOP VIEW FOR CLARITY
REAR WIRE
6°-30'
5/32 DIA. PIANO WIRE
B
E
C/G
1/8 DIA. DOWEL
3/8 SHEET
C2-2 1/8 SHEET
C2-3
F2-2
F2-3 WASHER SOFT SOLDER
F2-4
F2-5
3/32 SPRU
C2-1
F2-2 1/8 BALSA
F2-3
F2-4
1/8 PLY
TOP GRAIN
1/8 PLY
NOSE BLOCK F2-0
BATTERY PACK
3/32 D BRASS TUBE-EPOXY TO 3/16 SQ. CANOPY STIFFENER
1/16 SCRAP SHIM UNDER 3/16 SQ.
NOTCH TO FIT 3/32 X 1/4 SEE SECT. E
TOWHOOK WIRE NOT PROTRUDE
FUSELAGE SIDES F2 3/32 X 4 X 36
TOWHOOK BASE F2-12
F2-1 3/16 BALSA
F2-12
1/16 PLY
F2-1 CUT AWAY TO CLEAR BATTERY PACK
3/32 X 1/4 SPRUCE SKID
3/16 SHEET BALSA
3/32 DIA. PIANO WIRE TOW HOOK
A
B
C
D
E
F

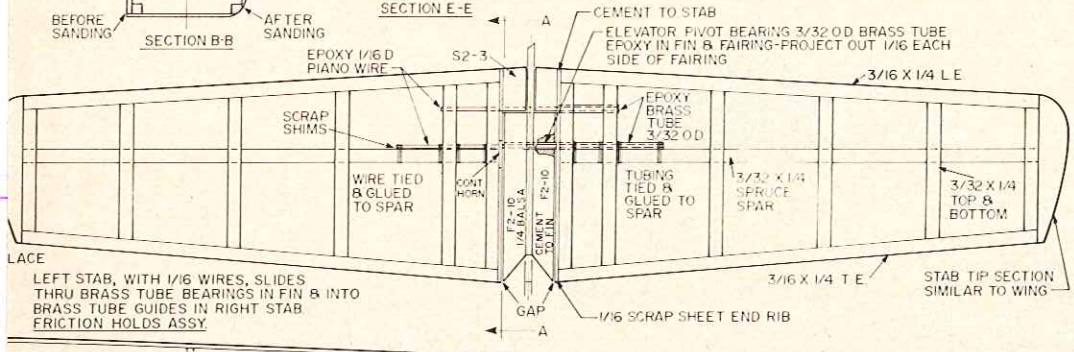


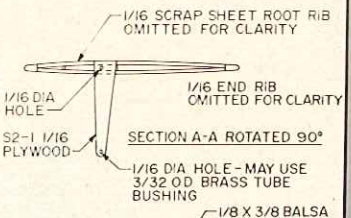


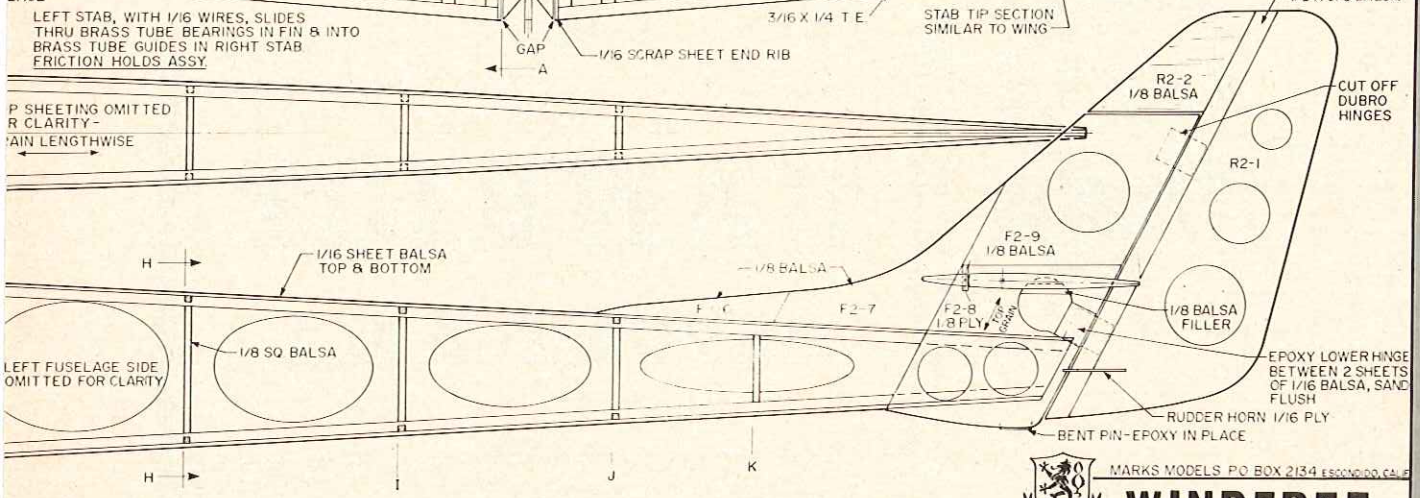
SECTION L-L











WING SPAN – 99.25 IN
WING AREA – 555 SQ IN (PROJECTED)
WEIGHT – 3.1 OZ

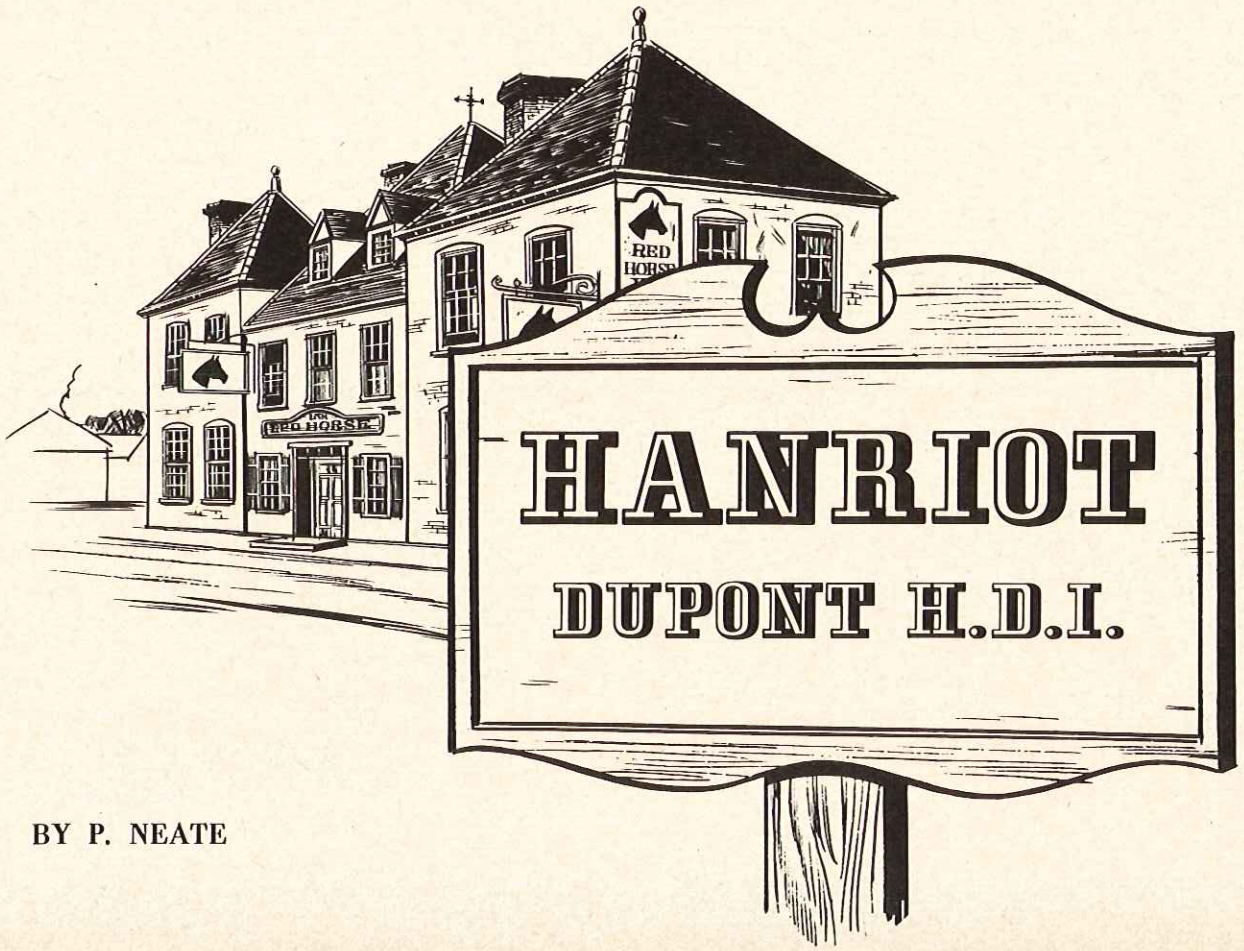
MARKS MODELS P.O. BOX 2134 ESCONDIDO, CALIF.

WINDFREE

DESIGNED & DRAWN BY	MARK & ROD SMITH	INKED BY	DICK KIDD

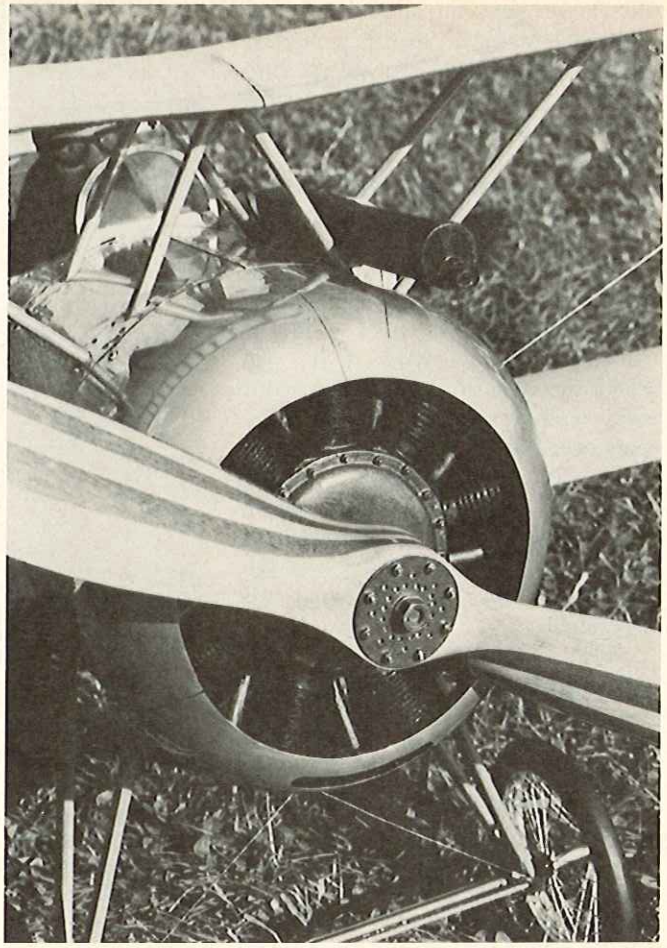
0 1 2 3 4 5 6

Hanriot prototype in colors of Italian fighter 80 Squadriglia Caccia, XIII Gruppo Aeroplani, Aeronautica Militare, Marcon, Italy, Summer 1918.



BY P. NEATE

Propeller positioned to cover carburetor. Dummy engine made from balsa, string, cardboard and plenty of filler.



This article is not meant to be a complete and comprehensive set of building instructions but, rather, simply a few notes that might help anyone thinking of building this model, or for that matter, those who are simply interested in it as a future scale project.

Let's begin by saying that this is not really a difficult model to construct, but it is definitely not for beginners either. But, if you have built models before you should be able to manage this one. It will take a bit of time, but it is well worth it, as you will see when the project is finished.

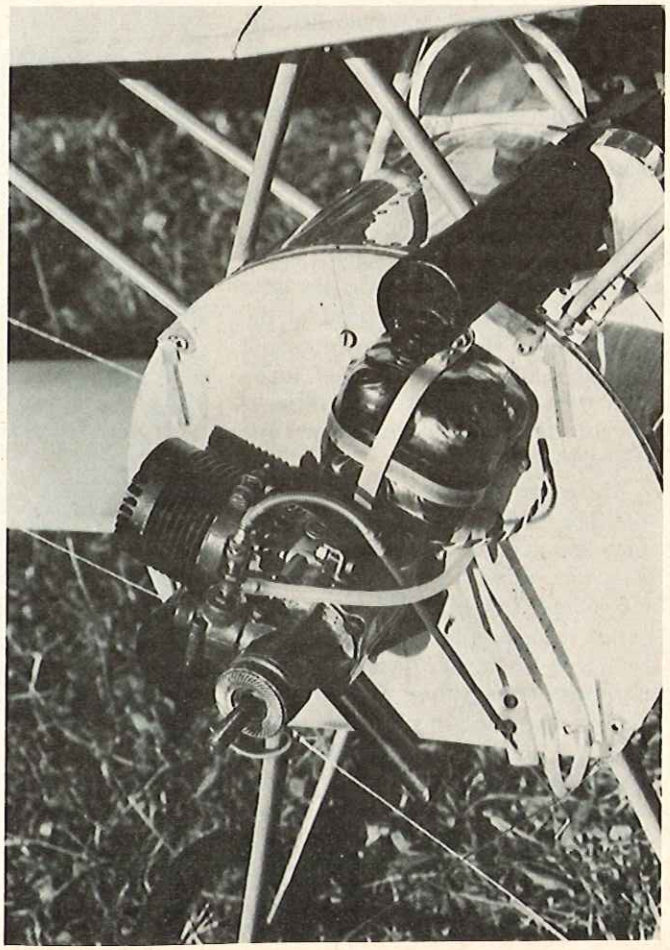
I originally chose the Hanriot since it was not very well known as a full scale aircraft, yet it had all the necessary moments and areas to make it fly well as a model. I think the small elevators with enclosed controls and the top wing dihedral really captured my eye. The model is as perfect in scale outline as I could make it from available information, and I've tried to keep as near as possible to scale construction and material sizes so that it looks right when covered. Profile Publications No. 109 will give you additional details and color scheme information. Other information on the Hanriot H.D.I. can be obtained from R.A.F. Flying Review Volume XVI, No. 4, available in England.

I have built this particular model in two sizes – 2" to the foot, and the one presented here, in 2½" to the foot scale. The former flies very well but a bit fast, thus the larger one was the one chosen for publication. I know transportation can be a problem, but the model can be dismantled for traveling in 10 minutes. Simply remove the 4 screws from the engine cowling, four 8 B.A.'s that hold the struts, and the two 6 B.A.'s that hold the section with the cabane struts in the fuselage. But then, do not expect to get it in a Volkswagen with your wife and two children!

As far as price goes, I think you will find this type of model quite economical to build. I do not think that mine cost more than about a third of the price of the average large scale kit. As far as the full scale prototype is concerned, the H.D.I. was a Belgian designed airplane of WW I vintage and used extensively by the Italians. From what I can find out, it was a splendid aircraft and should have been more popular but, for political reasons, it never gained its well deserved popularity. The Profile Publications, mentioned earlier, details a full background on the original aircraft.

CONSTRUCTION

I will give a few pointers on building the model although most of it can be readily understood from studying the plans. The construction is mostly made up of spruce, none of which is over 3' in length, in order to keep the sizes of wood down and the strength up. The main construction was done with Titebond glue since it is much better for hardwood, provides a nice . . . . . .



Nickel cadmium pack on front bulkhead. Needle valve and filler tubes extend out bottom where they don't show.

flexible airframe, and although it takes somewhat longer to dry than the fast drying epoxies, you can always find enough to do for one day at a time while leaving another section to dry overnight.

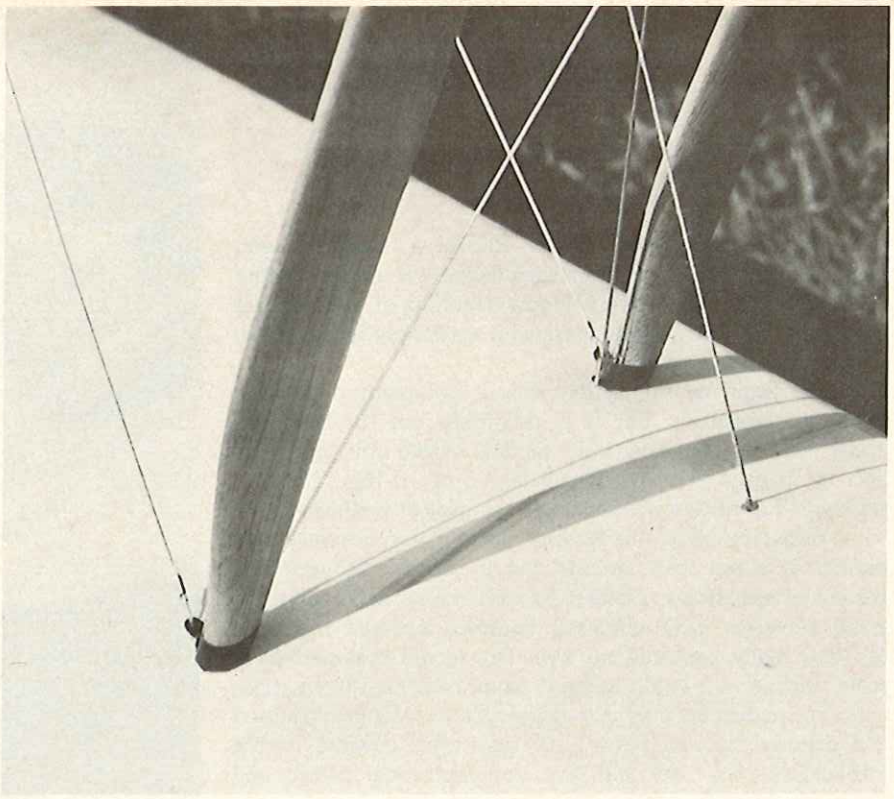
I would suggest, although I did not do it myself, that the top wing be built on a wing board so that it will be exactly true. First, make up the spars for it, then glue and clamp them up with clothespins. It takes a lot of clothespins for two spars, so it's suggested that you don't do this on your wife's washing day! Make sure that the spars each have exactly the same dihedral. Also, at this stage, you should mark and cut the slots for the aileron hinges in the rear spar. I did not, and had a devil of a job getting through that hardwood when the wing was completed.

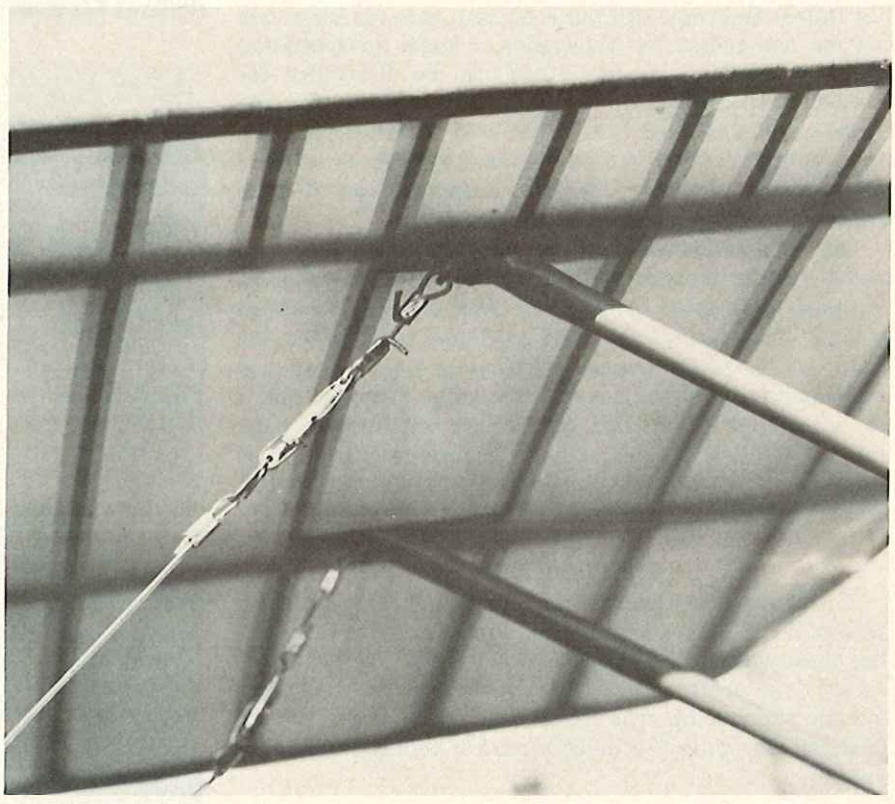
Now, either build the wing on the wing board, set at the dihedral of the spars (8½ degrees), or build on a flat board with half of the spars sticking over the end. When that half is dry, remove it from the board, pin out the other half of the wing plan and build that half of the wing onto the spars with the first half of the wing sticking over the edge. Make sure it lines up though, since you do not want swept back wings! If you use the wing board the plans have been drawn so that the end with half the top wing on it can be cut off and joined to make a complete wing plan. The leading and trailing edges are pinned to the board but the spars and ribs are packed up.

When the wing is removed from the board, cap strips are put on the bottom of each rib, which is much easier and stronger than threading ribs onto spars, and gussets are applied at the trailing edge. The latter provides more strength and makes its scale shape show through the covering. Ailerons are cut out and completed when the wing is built.

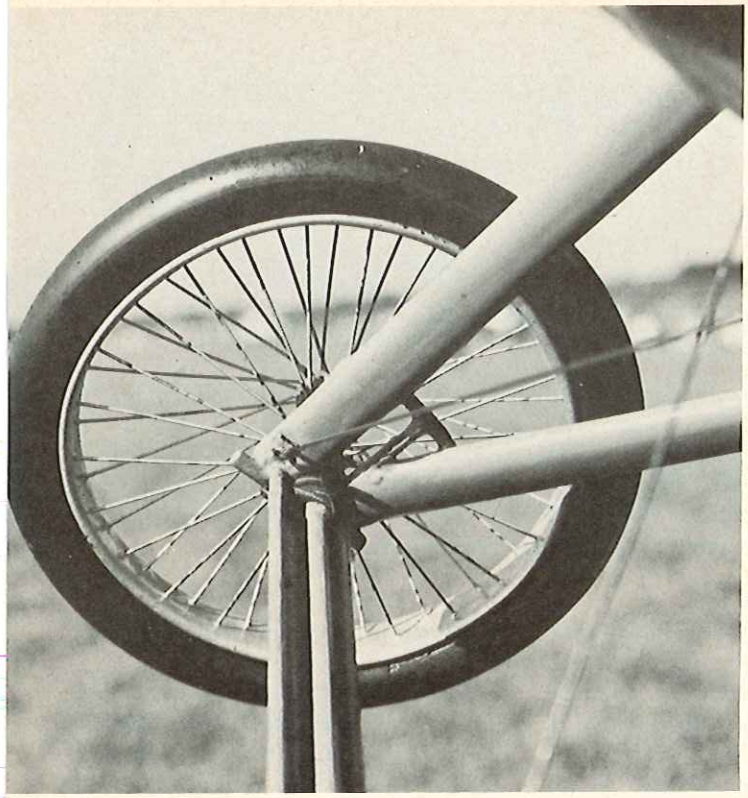
The lower wings are constructed in the same fashion but are very simple since they consist of separate panels. Wing tips, as well as the tailplane fin and rudder, are laminated from 1/16" spruce. The accepted and easy way to do this is to make a template from hard balsa or plywood. Then soak the spruce, bend and clamp around the template, and allow to dry, or, if you prefer, bake it in your wife's oven. When dry, remove from the template and then glue together and replace on the templates until the glue has dried. Then it is removed, once again, and built onto your model. By the way, do not forget that the wing tips have undercamber and have to be bent in two directions when clamping up. It would also be wise to remember not to use pins that will rust or you will stain the wood which will show through the covering if the model is to have a natural fabric finish.

The fuselage is just a normal "slab-sider" with a turtle deck and front sides which are added after basic construction. The front of my prototype

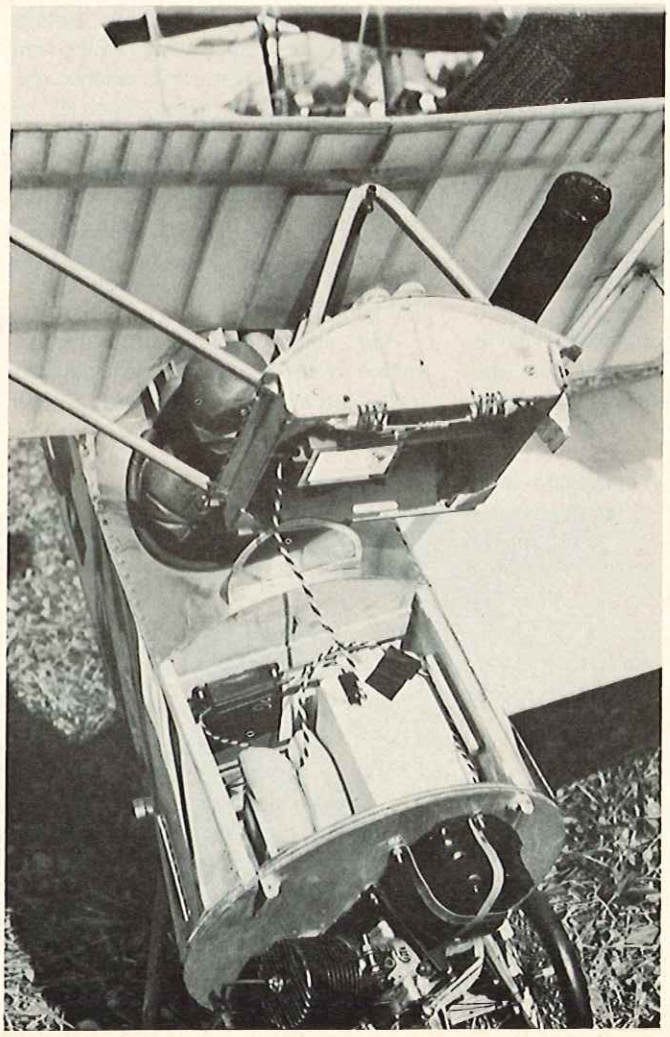


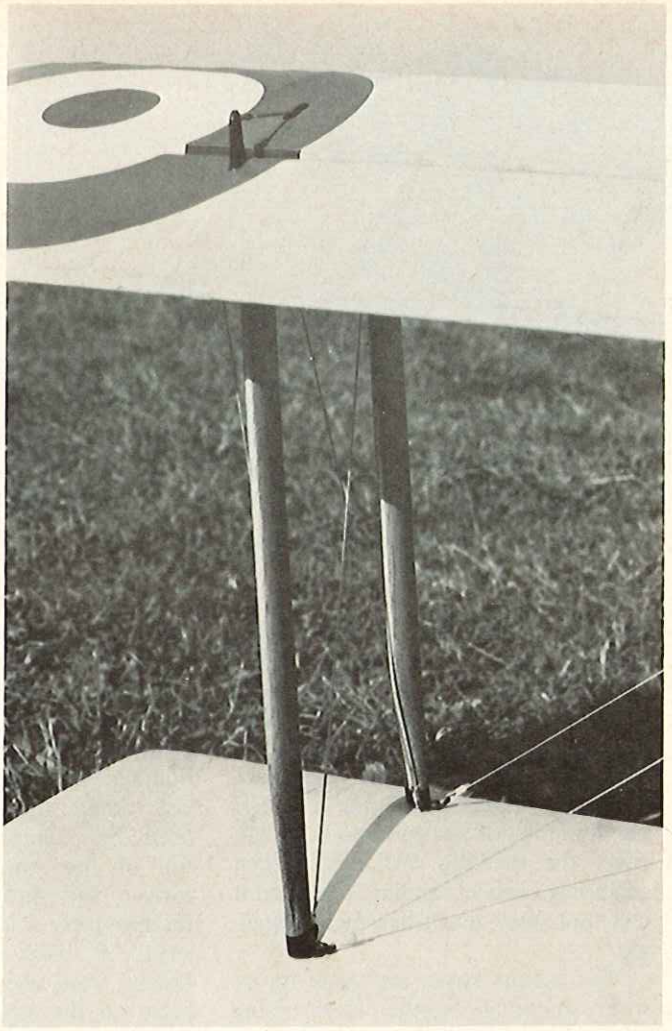


ABOVE: Dummy aileron control made from silver sheering elastic glued to main spar. BELOW: View of turnbuckles to adjust landing wires. Note shear points. Ring of wire lightly soft soldered to open up in case of a hard knick, which is better than ripping the mounting points out!



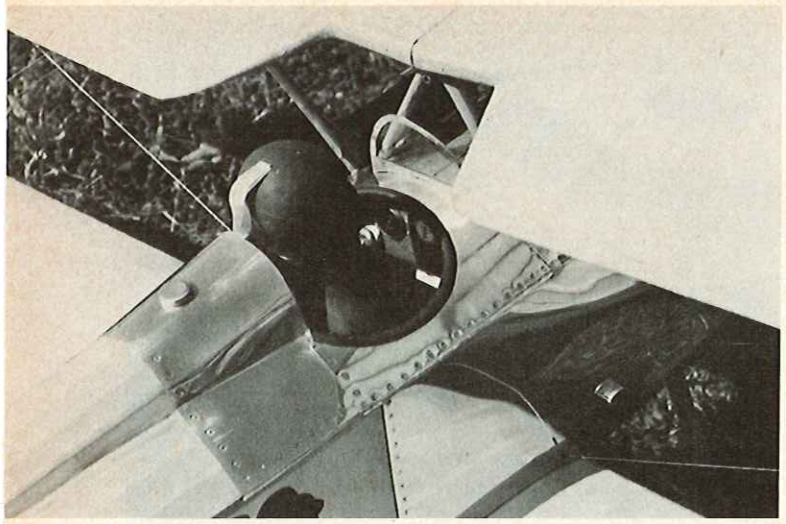
ABOVE: Undercarriage and spring with bungee rubber. BELOW: View of radio installation. Aileron servo, switch access from inside cockpit. Servo access through belly hatch.



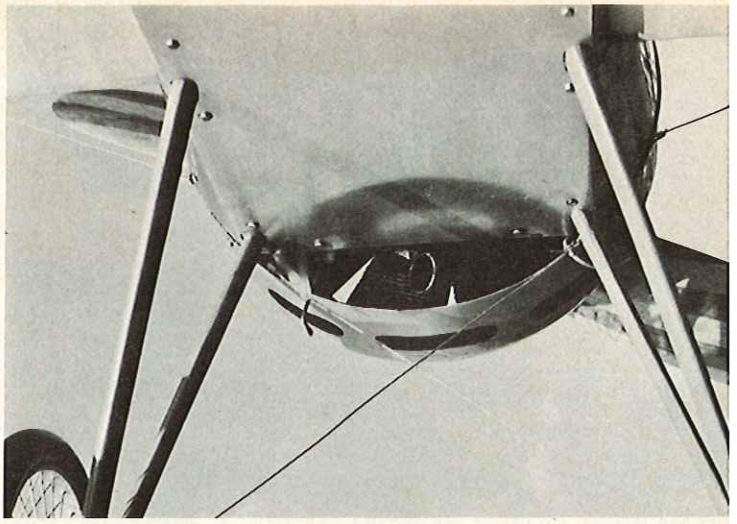


Close-up view of wing strut and wire fittings. Rib tapes are nylon, doped to grease proof paper before cutting into strips. Then peeled off as required.

For wheel construction see RCM, August 1969. Note needle valve and filler tubes.



View of cockpit and auxiliary fuel tank behind pilot.



Exhaust outlet and access panel to servos.

is covered with .010" aluminum over the balsa sheeting, using contact adhesive. This is added after the fuselage is nylon covered from the balsa sheet back. If you don't follow this procedure you will find that you have nothing to which to stick the nylon! If the aluminum is not going to be fitted, cover the sheeting with nylon, then add a few coats of sanding sealer and it will look very much like metal paneling.

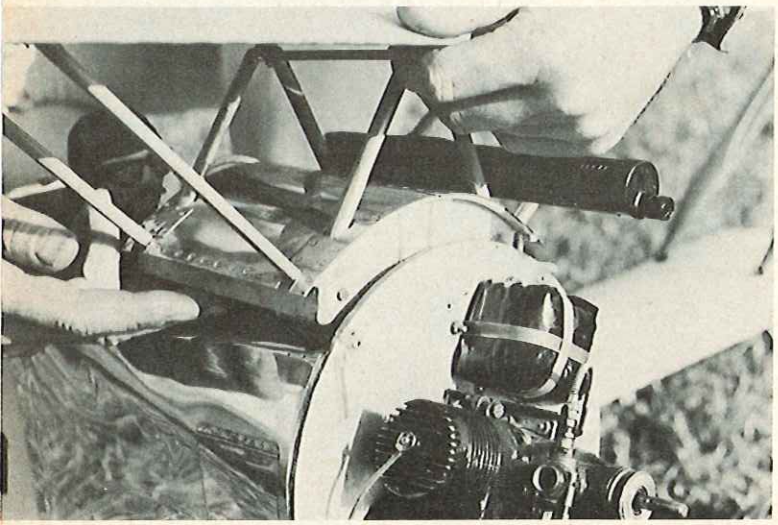
The cabane struts are made up by silver soldering together steel tubing and 1/8" piano wire. Don't forget to solder the wing mounting plates on top of them. The front and rear outer struts have been temporarily bolted to the wing and the cross bar and center mounting points are soft soldered in place. These are drilled and temporarily bolted. Next, bolt the fuselage fixing points into the part of the fuselage that lifts out. This is before it is sheeted. Fix the fuselage down to a flat board and fit in the removable part with the wing and take measurements to obtain the correct angle of incidence. This is important, so keep fiddling with it until it is right before you clamp up those fuselage fixing bolts. Now remove the wing from the top of the struts. Cover the lower surface and sheet in the detachable fuselage piece. Clad the rear and center struts in balsa to match the oval hollow front ones, then bolt the wing back on the struts permanently. Fit the aileron controls in place through the struts.

Fit the lower wing while the fuselage is still on the board, and then make up the inter-plane struts. Simply soft solder lengths of 18 SWG wire between the metal fixing plates bolted to the upper and lower wings. That is basically the construction of the struts – just unbolt and remove them, clad them in hardwood, and the job is done.

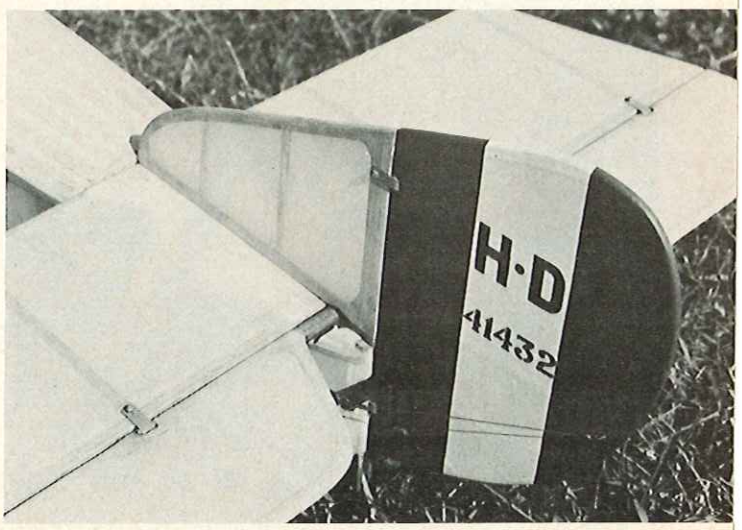
It can be seen, now, how easy it is to strip this model down for transportation. If the lower end of the flying wires are unhooked off the spring loaded fuselage attach points (use a pin or a piece of wire to stop the wires from disappearing into the fuselage), the lower strut bolts removed, and the two bolts holding the cabin section removed; the upper wing, flying and landing wires, struts and cabane section with aileron servo, can all be lifted off as one piece and the lower wings can then be unplugged. The lower wings will stay in place with just the landing wires holding them. By the way, it goes without saying that this plane cannot be flown without flying and landing wires!

The engine cowling and dummy engine is up to you – you might be lucky and be able to obtain the former

Wing mounting section being set into position.



Photographic view of empennage assembly.

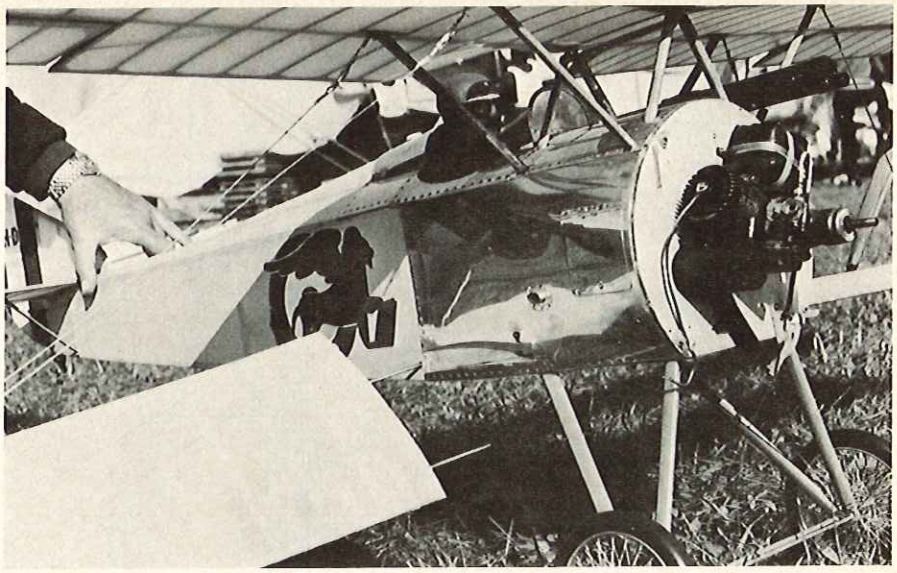


spun in aluminum or, alternately, you could make one from fiberglass. You will have to make a mock-up first, though, from which to obtain a mold. I made mine from two aluminum kettles. I had to use two as I could not find a single one that was 8½" in diameter. It took some time to find one that was the right contour and then it was only 8" in diameter so I cut two of them into segments between the spout and the handle and, using 3 of these segments, managed to rivet them into an 8½" diameter cowling. The dummy engine is made primarily of balsa with string wound cylinders and lots of sanding sealer. The whole mess is then epoxied into position on the cowling and cut away to clear whatever engine you plan to use. I would not recommend anything less than a .60 even though it will fly happily on 3/4 power, but you do want full power to get off the ground properly. By the way, I used approximately 1½ degrees side and down thrust.

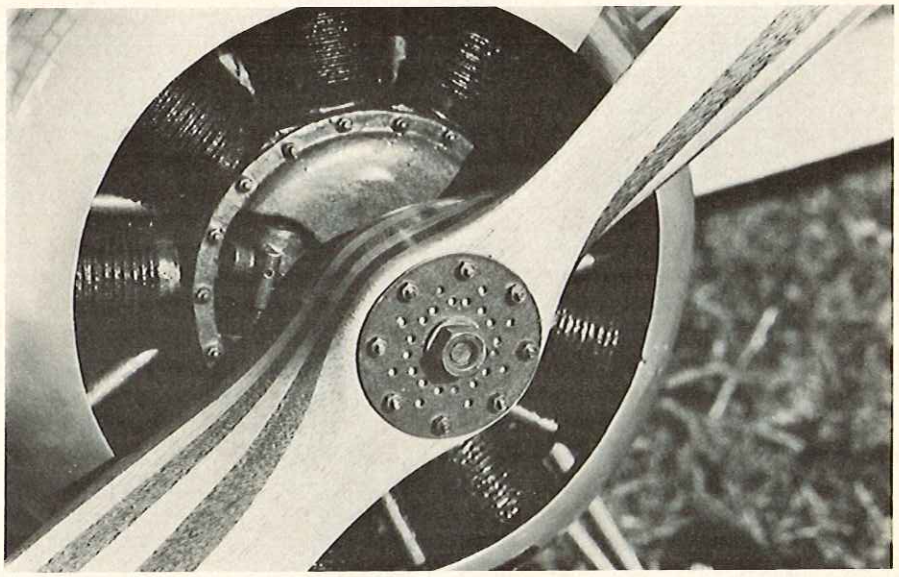
When it comes to radio installation, your radio gear must be installed as far forward as possible with your nickel cadmium pack alongside the engine under the cowling and your servos and receiver directly behind the front bulkhead and under the fuel tank. Be sure to use a good fuel tank that will not leak! I used a square Kodak developer bottle, stuck to the fuselage with plenty of servo tape.

FLYING

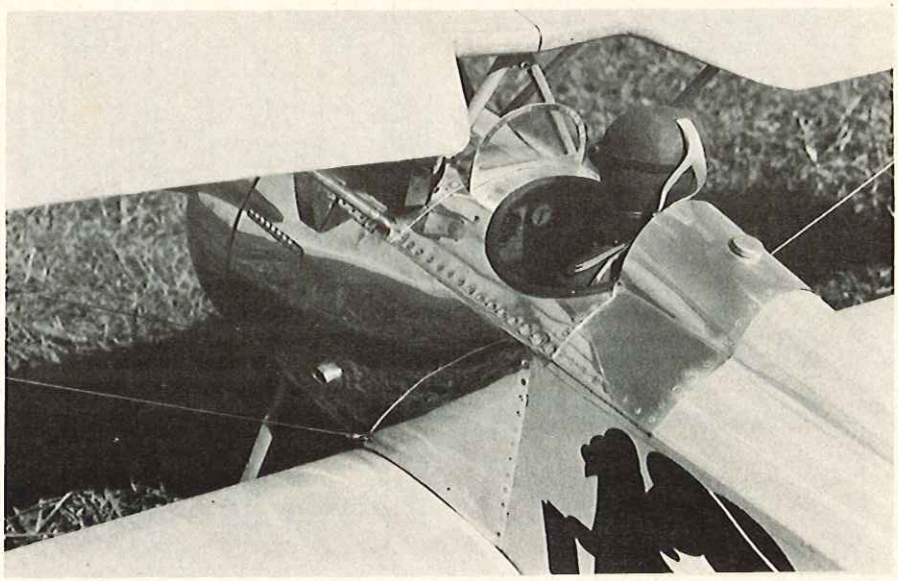
This model is one of the easiest that I have ever flown. On its first flight it flew perfectly straight, needing only a little right trim (I should have built the wings on a wing board). I will say, however, when you take off, that you should let the tail come up first, otherwise it will mush off the ground with too much elevator and its nose up, as it did for me at the British Nationals. If this happens it is a job to keep flying speed up in order to climb away. Aileron control can be a bit sluggish, especially in a maneuver like an Immelman when you have lost speed at the top of the loop. But all in all, the model is a pure joy to fly. I think its size has a lot to do with it since you can certainly see it easily at altitude and it seems to give you more time to think. I hope that any of you who build a Hanriot have as much fun and success with the model as I have had and, if you need any advice on building or flying it, drop me a letter c/o R/C Modeler Magazine. □



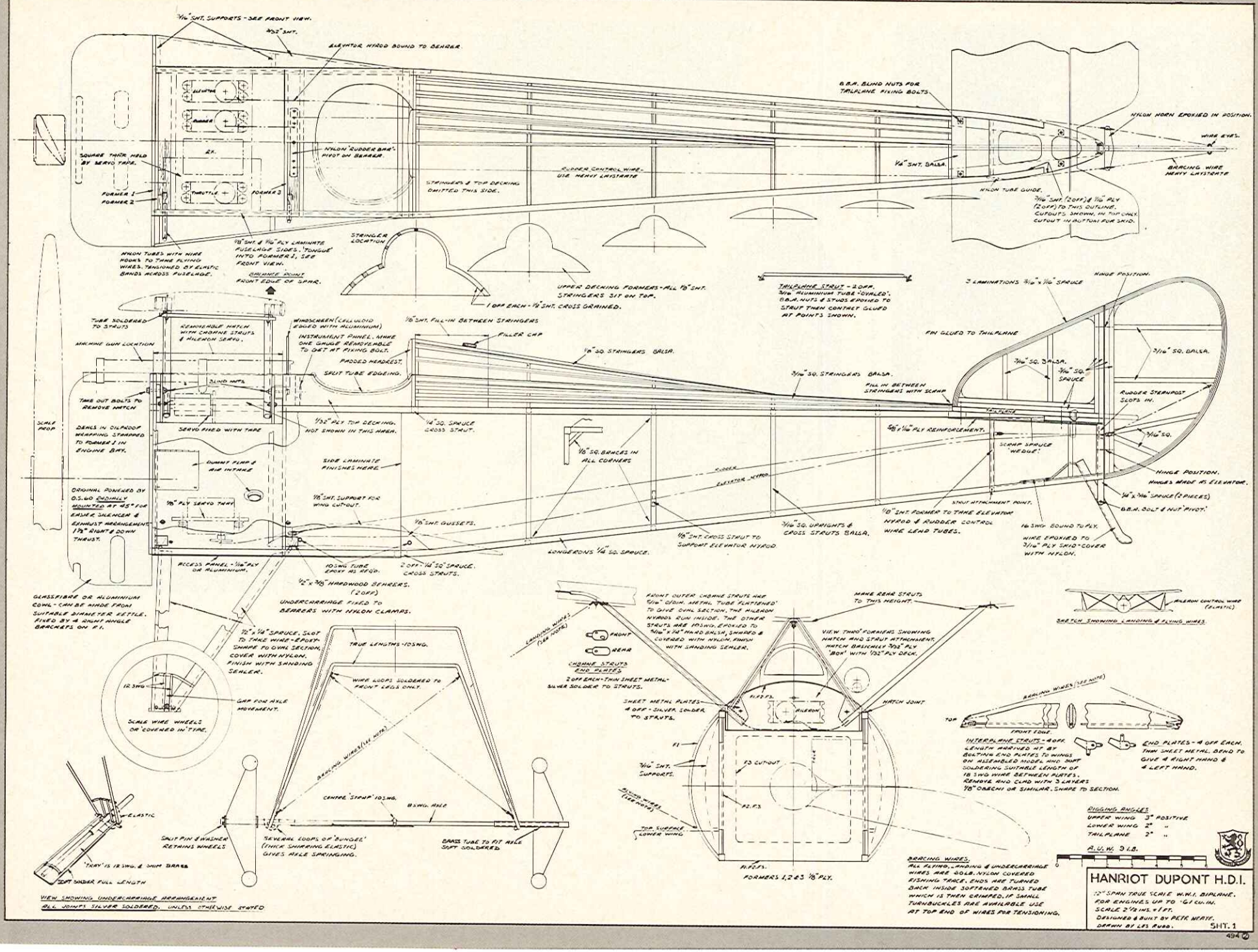
The lower wing just plugs in and is held in place by the landing wires.

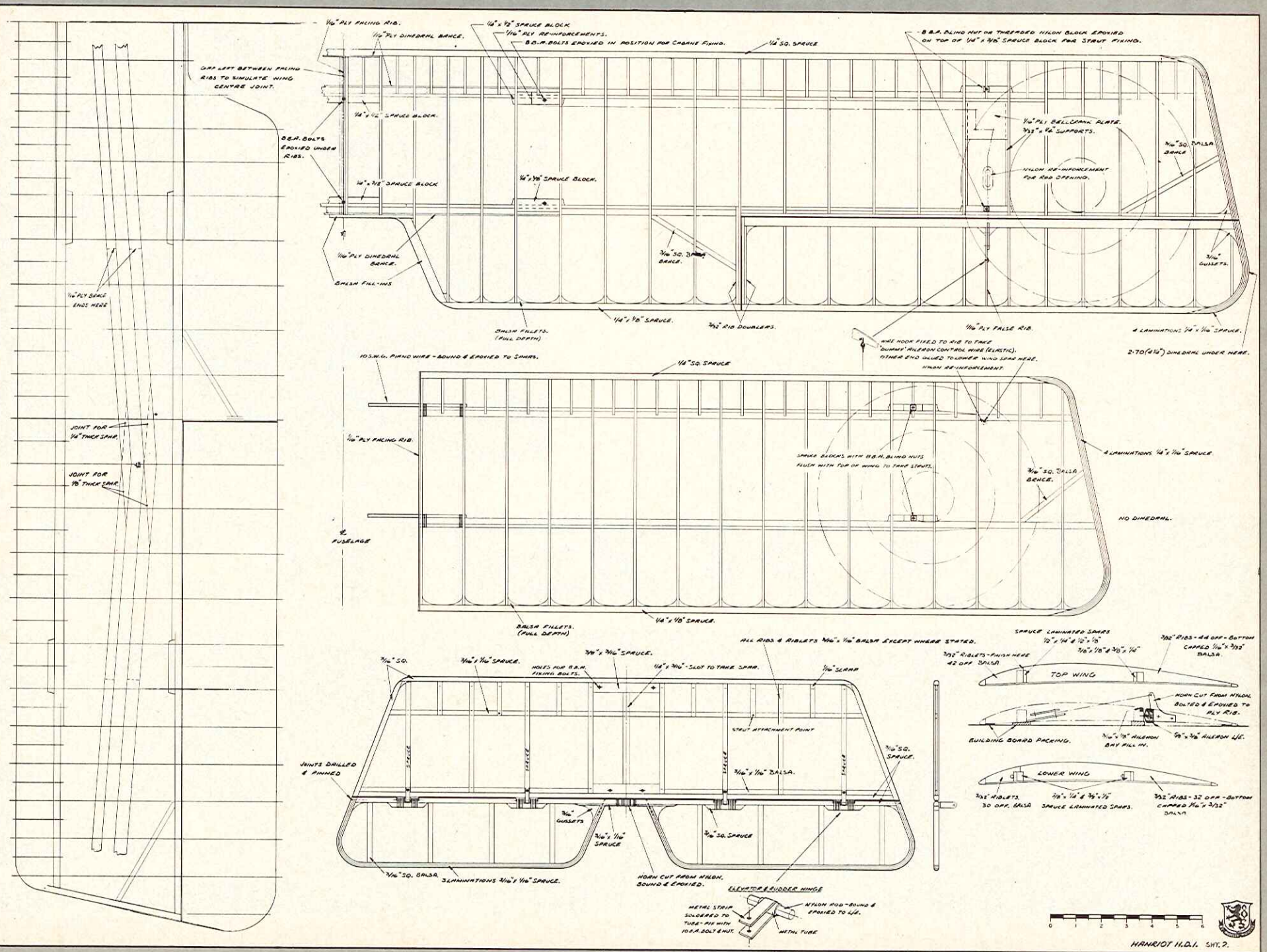


To eliminate sight of R/C carb, rear induction engine could be used if a priming tube was fitted.



The fuselage must be covered before the aluminum is fitted in place.


3/16" SHT. SUPPORTS - SEE FRONT VIEW.
1/32" SHT.
ELEVATOR HYROD BOUND TO BEARER.
B.B.A. BLIND NUTS FOR TAILPLANE FIXING BOLTS.
NYLON HORN EPOXIED IN POSITION.
WIRE EYES.
BRACING WIRE HEAVY LAYSTRATE
SQUARE THUR HELD BY SERVO TAPE.
FORMER 1
FORMER 2
FORMER 3
NYLON 'RUDDER BAR' PIVOT ON BEARER.
STRINGERS & TOP DECKING OMITTED THIS SIDE.
RUDDER CONTROL WIRE - USE HEAVY LAYSTRATE
1/4" SHT. BALSA.
NYLON TUBE GUIDE.
3/16" SHT. (2 OFF) & 1/16" PLY (2 OFF) TO THIS OUTLINE. CUTOUTS SHOWN, IN TOP ONLY. CUTOUT IN BOTTOM FOR SKID.
NYLON TUBES WITH WIRE HOOKS TO TAME FLYING WIRES, TENSIONED BY ELASTIC BANDS ACROSS FUSELAGE.
1/8" SHT. & 1/16" PLY LAMINATE FUSELAGE SIDES, 'TONGUE' INTO FORMER 2, SEE FRONT VIEW.
BALANCE POINT FRONT EDGE OF SPAR.
STRINGER LOCATION
UPPER DECKING FORMERS - ALL 1/8" SHT. STRINGERS SIT ON TOP.
1 OFF EACH - 1/8" SHT. CROSS GRAINED.
TAILPLANE STRUT - 2 OFF. 3/16" ALUMINIUM TUBE "OVALED". B.B.A. NUTS & STUDS EPOXIED TO STRUT THEN CONTACT GLUED AT POINTS SHOWN.
3 LAMINATIONS 3/16" x 1/16" SPRUCE
HINGE POSITION.
TUBE SOLDERED TO STRUTS
REMOVEABLE HATCH WITH CHROME STRUTS & AILERON SERVO.
WINDSCREEN (CELLULOID EDGED WITH ALUMINIUM)
1/16" SHT. FILL-IN BETWEEN STRINGERS
FILLER CAP
FIN GLUED TO TAILPLANE
MACHINE GUN LOCATION
INSTRUMENT PANEL. MAKE ONE GAUGE REMOVEABLE TO GET AT FIXING BOLT.
1/8" SQ. STRINGERS BALSA.
3/16" SQ. BALSA.
PADDED HEADREST.
3/16" SQ. BALSA.
3/16" SQ. SPRUCE
SPLIT TUBE EDGEING.
3/16" SQ. STRINGERS BALSA.
FILL IN BETWEEN STRINGERS WITH SCRAP
RUDDER STERNPOST SLOTS IN.
TAKE OUT BOLTS TO REMOVE HATCH
BLIND NUTS.
1/32" PLY TOP DECKING NOT SHOWN IN THIS AREA.
1/4" SQ. SPRUCE CROSS STRUT.
SCALE PROP
DENTS IN OILPROOF WRAPPING STAMPED TO FORMER 1 IN ENGINE BAY.
SERVO FIXED WITH TAPE
1/8" SQ. BRACES IN ALL CORNERS
3/16" SQ. UPRIGHTS & CROSS STRUTS BALSA.
1/8" SHT. CROSS STRUT TO SUPPORT ELEVATOR HYROD
1/8" SHT. FORMER TO TAME ELEVATOR HYROD & RUDDER CONTROL WIRE LEAD TUBES.
1/8" SQ. SPRUCE (2 PIECES)
B.B.A. BOLT & NUT 'PIVOT'.
16 SWG BOUND TO FLY. WIRE EPOXIED TO 3/16" PLY SKID-COVER WITH NYLON.
HINGE POSITION. HINGES MADE AS ELEVATOR.
ORIGINAL POWERED BY O.S. 60 ENGINE MOUNTED AT 45° FOR EXHAUST SILENCER & EXHAUST ARRANGEMENT. 1/8" RIGHT & DOWN THRUST.
DUMMY PIPE & AIR INTAKE
SIDE LAMINATE FINISHES HERE.
1/16" PLY SERVO TRAY
1/16" SHT. SUPPORT FOR WING CUTOUT.
1/16" SHT. GUSSETS.
SCRAP SPRUCE 'WEDGE'
STRUT ATTACHMENT POINT.
ACCESS PANEL - 1/16" PLY OR ALUMINIUM.
10 SWG TUBE EPOXY AS REQD.
2 OFF - 1/4" SQ. SPRUCE CROSS STRUTS.
LONGERONS 1/4" SQ. SPRUCE.
1/2" x 3/8" HARDWOOD BEARERS. (2 OFF)
UNDERCARRIAGE FIXED TO BEARERS WITH NYLON CLAMPS.
GLASSFIBRE OR ALUMINIUM COWL - CAN BE MADE FROM SUITABLE DIAMETER KETTLE. FIXED BY 4 RIGHT ANGLE BRACKETS ON F1.
1/2" x 1/4" SPRUCE, SLOT TO TAKE WIRE - EROSS-SHAPE TO OVAL SECTION, COVER WITH NYLON. FINISH WITH SANDING SEALER.
TRUE LENGTHS - 10 SWG.
WIRE LOOPS SOLDERED TO FRONT LEGS ONLY.
12 SWG
GAP FOR AXLE MOVEMENT.
SCALE WIRE WHEELS OR 'COVERED IN' TYPE.
BRACING WIRES (SEE NOTE)
CENTRE 'STRUT' 10 SWG.
8 SWG. AXLE
ELASTIC
SPLIT PIN & WASHER RETAINS WHEELS
SEVERAL LOOPS OF 'BUNGEE' (THICK SHIRRING ELASTIC) GIVES AXLE SPRINGING.
BRASS TUBE TO FIT AXLE SOFT SOLDERED
'TRAY' IS 18 SWG. & SHIM BRASS
SOFT SOLDER FULL LENGTH
VIEW SHOWING UNDERCARRIAGE ARRANGEMENT
ALL JOINTS SILVER SOLDERED, UNLESS OTHERWISE STATED
LANDING WIRES (SEE NOTE)
FRONT
REAR
CHROME STRUTS END PLATES
2 OFF EACH - THIN SHEET METAL - SILVER SOLDER TO STRUTS.
FRONT OUTER CHROME STRUTS ARE 5/16" O.D.IN. METAL TUBE FLATTENED TO GIVE OVAL SECTION. THE AILERON HYRODS RUN INSIDE. THE OTHER STRUTS ARE 10 SWG. EPOXIED TO 3/16" x 1/4" HARD BALSA, SHAPED & COVERED WITH NYLON. FINISH WITH SANDING SEALER.
MAKE REAR STRUTS TO THIS HEIGHT.
VIEW THRU' FORMERS SHOWING HATCH AND STRUT ATTACHMENT. HATCH BASICALLY 3/16" PLY 'BOX' WITH 1/32" PLY DECK.
SHEET METAL PLATES - 4 OFF - SILVER SOLDER TO STRUTS.
F1 F2 F3
AILERON
HATCH JOINT
F1
3/16" SHT. SUPPORTS.
F3 CUTOUT
SCALE
AILERON WIRES (SEE NOTE)
F2 F3
TOP SURFACE LOWER WING
F1 F2 F3.
FORMERS 1, 2 & 3 1/8" PLY.
SKETCH SHOWING LANDING & FLYING WIRES.
AILERON CONTROL WIRE (ELASTIC)
BRACING WIRES (SEE NOTE)
TOP
FRONT EDGE
INTERPLANE STRUTS - 4 OFF. LENGTH ARRIVED AT BY BOLTING END PLATES TO WINGS ON ASSEMBLED MODEL AND SOFT SOLDERING SUITABLE LENGTH OF 18 SWG WIRE BETWEEN PLATES. REMOVE AND CLAD WITH 3 LAYERS 1/16" OBECHI OR SIMILAR. SHAPE TO SECTION.
END PLATES - 4 OFF EACH. THIN SHEET METAL. BEND TO GIVE 4 RIGHT HAND & 4 LEFT HAND.
RIGGING ANGLES
UPPER WING 3° POSITIVE
LOWER WING 2° "
TAILPLANE 2° "
A.U.W. 3 LB.
BRACING WIRES
ALL FLYING, LANDING & UNDERCARRIAGE WIRES ARE GOLD. NYLON COVERED FISHING TRACE. ENDS ARE TURNED BACK INSIDE SOFTENED BRASS TUBE WHICH IS THEN CRIMPED. IF SMALL TURNBUCKLES ARE AVAILABLE USE AT TOP END OF WIRES FOR TENSIONING.
HANRIOT DUPONT H.D.I.
72" SPAN TRUE SCALE W.W.I. BIPLANE. FOR ENGINES UP TO .61 CU.IN. SCALE 2 1/8 INS. = 1 FT.
DESIGNED & BUILT BY PETE WAITE.
DRAWN BY LES RUDD.
SHT. 1
494

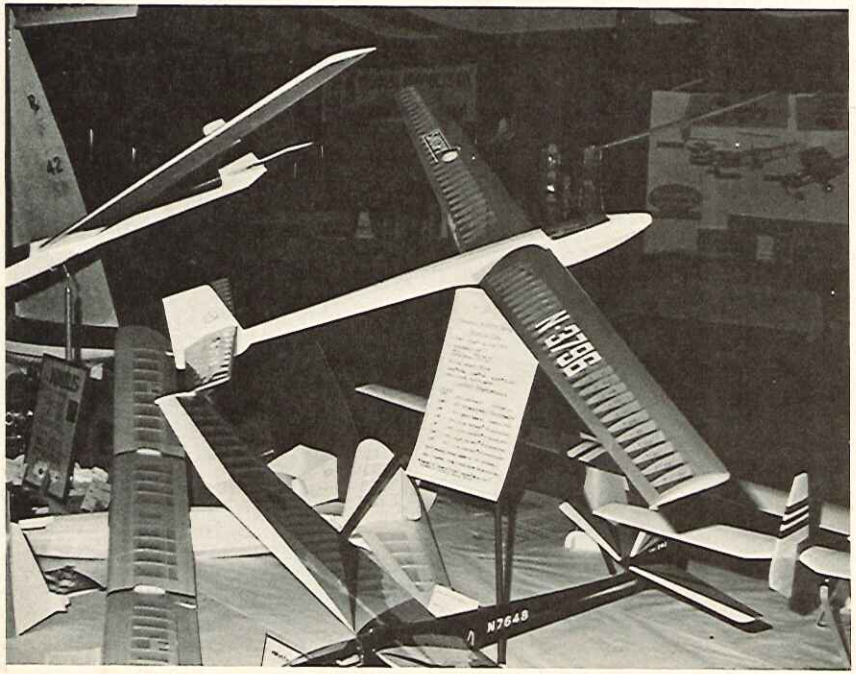


HANRIOT H.D.1. SHT. 2.

RCM PHOTOS BY BERNIE MURPHY

TOLEDO'72

THE WORLD'S LARGEST R/C CATALOG.....PUBLISHED ANNUALLY BY THE WEAK SIGNALS CLUB



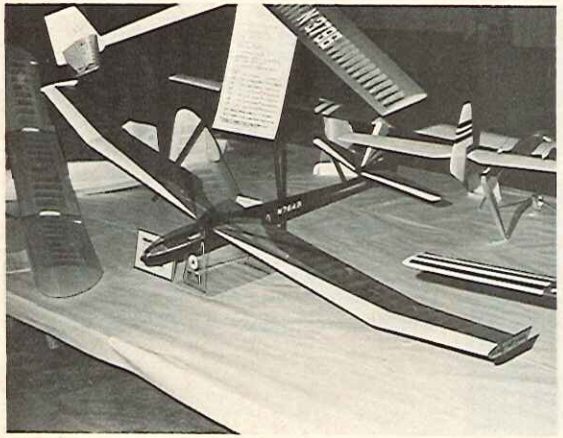
1st in show at Toledo '72, Otto Heithecker's Snoopy Sailplane, to be published by RCM.

At one time or another, most of us have spent a few quiet hours dreaming between the covers of a hobby catalog, the type published by some of the mail order outfits. You study the photos, read the fine print, and dream about owning a particular item. With something new, you might wish that you could see the item in use, lift, shake, squeeze, and otherwise operate it. Hard to do with a printed page!

Once a year, however, it is possible to open the cover of the "World's Largest R/C Catalog", entering to become totally engulfed within its "pages". This "catalog" is "published" annually by the Weak Signals Radio Control Club of Toledo, Ohio. This years edition was "Vol. 18", under the title "18th Annual Mid-Winter R/C Conference and Exposition."

Here you will find over 100 manufacturers and organizations actively engaged in the advancement of OUR sport and hobby. From AMA to XL-ent, with only Q,U,Y, and Z not represented. Each with his latest concept for you to inspect and appraise. Here is YOUR opportunity to express YOUR opinions on quality, performance, service, etc., directly to the manufacturer or designer. The policies and product lines of many manufacturers have been substantially altered as a result of RC'ers acceptance or rejection at Toledo. Prototype items not favorably received, may never be marketed, while those generating excitement may well be marketed earlier than planned.

This years Conference attracted a capacity crowd, threatening to close the doors for lack of space at one point. Those who attended saw the very latest in radio equipment design, subtle changes, but improvement in circuitry, resolution, reliability and packaging were evident in most lines – Kraft's new batteries, IC servo, control sticks and pots, double conversion receiver; RC Manufacturing's new system with IC encoder, decoder and servo, double tuned receiver; Heathkit's new 8 channel system with impressive styling; Pro-Line refined and repackaged; World Engines with a new sophisticated "Expert Series" to



mention a few.

Retracts were well represented, with at least 12 different models being shown, electrical, mechanical, and pneumatic types. Retract prices are becoming more reasonable to the average builder, and the coming year should see a sizeable increase in their use. Perhaps even a few more kits designed for them.

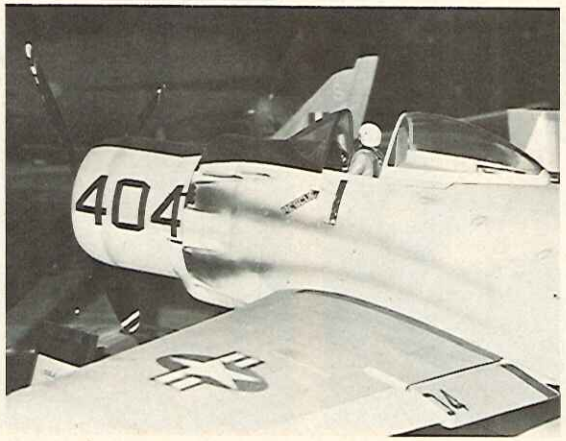
More new wood ships were shown this year, with a slight reduction in the number of plastic ARF's. Foam wings and fibreglass fuselage ships were abundant in the competition designs, and some of the top ships were shown in both wood (built up) and fibreglass versions.

One of the high points of the Conference was the advent of the R/C helicopter. Here was something truly NEW. Four different models were shown, with flight demonstrations by some. The Bell Huey Cobra designed by Dieter Schluter and flown so successfully at the World Championships, is being kitted in Germany by Hegi, and will be imported by Aristo-Craft in New York. The Kavan model of the Bell Jet Ranger will be imported by MRC in New Jersey. A smaller Bell Cobra, utilizing the Schluter mechanism is being produced in Japan, and will also be imported by Aristo-Craft. All of these should be available by early Summer (1972). From the response, we would suggest that you order early, as there IS a waiting list.

Smaller than the others, Du-Bro's little Whirlybird 505 provides an economical beginning. It is not as sophisticated as the other machines, but then the cost is about 1/3rd, as is the weight, resulting in a machine that will be more tolerant of those beginners mistakes — both on the wallet and damage to the ship. These are currently available.

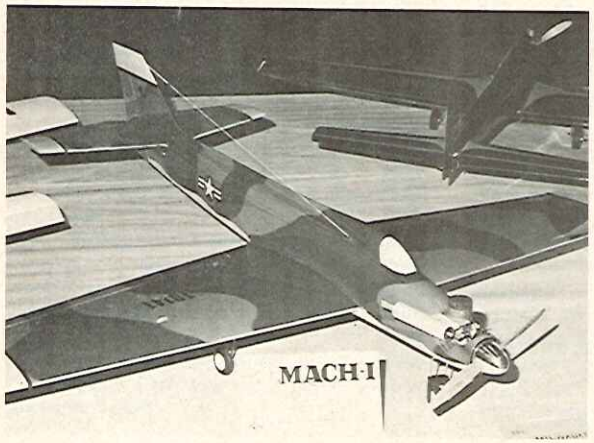
In addition to the products aspect of the Toledo Conference, the Conference affords all of those who attend the opportunity to attend talks, films and demonstrations by the respected leaders in various phases of our hobby. These, together with the chance to discuss favorite subjects with other modelers from other areas, assure a pleasant time for all.

Here, also, is the place to win recognition for that beautiful creation that has kept you in the workshop till the wee hours of



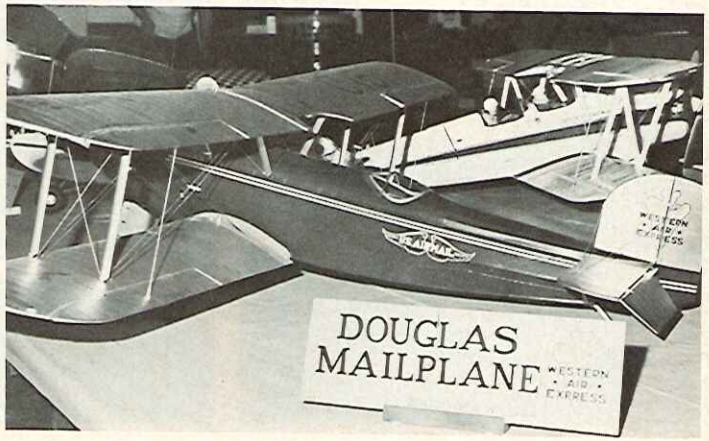
TOP ROW, LEFT: Tom Kelley's (Lansing, Michigan) 3rd place winning modified Alpha; CENTER: Best Sport R/C Design, The Mariner, by Wan Jono (Toledo, Ohio); RIGHT: Dario Brisighella's (Oak Creek, Wisconsin) Double Winner, RCM Editors Trophy and Best Original Design. CENTER ROW: Bud Nosen's (Two Harbors, Minn.) Douglas Skyraider won Best Military Scale. FAR LEFT: Closeup of Nosen's Skyraider. LEFT: Check this finish.

TOLEDO '72



the morning, all Winter long. This year's top awards were as follows: Most Outstanding Finish (R/C Modeler) – Dario Brisighella, Oak Creek, Wisconsin; Best MonoKote Finish (Top Flite) – Bill Darin, Trenton, Michigan; Best Sport Airplane – Wan Jung, Toledo, Ohio; Best R/C Sailplane (Midwest Model Supply) – Otto Heithecker, Royal Oak, Michigan; Best WW I Aircraft (Woodcraft Products) – Josh Titus, Paramus, N.J.; Best Military Scale – Bud Nosen, Two Harbors, Minnesota; Best Non-Military Scale – Bob Wischer, Delafield, Wisconsin; Best Standoff Scale – Robert Miller, Cincinatti, Ohio; Best Original Design – Dario Brisighella, Oak Creek, Wisconsin; Best Pylon Racer – Dave Gierke, W. Seneca, New York; Best R/C Model Built by a Junior (16 and under) – Ray Hostetler, Orville, Ohio; Best R/C Car – Bill Miller, Chicago, Illinois; Best R/C Boat – Glen Staubitz, Buffalo, New York; Best Competition Racing Boat – John Bridge, Detroit, Michigan.

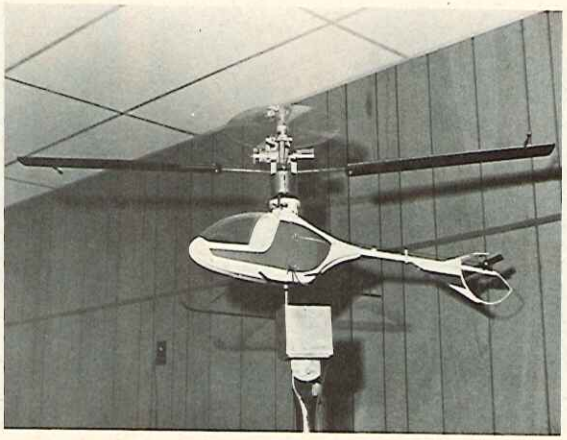
The competition was quite close in most categories, and the judges certainly got a workout. Our congratulations, not only to the winners, but to all of those who brought and entered their ships. It was a pleasure to see so many fine ships, each a tribute to its builder. We were particularly pleased to see Phil Fuller of the Weak Signals Club take second place in the highly contested RCM Finish award. Phil is a relative newcomer to RC. When we first met, 3 years ago, Phil scarcely knew one end of an R/C ship from the other. Such progress is certainly enviable. He is also one of those club members



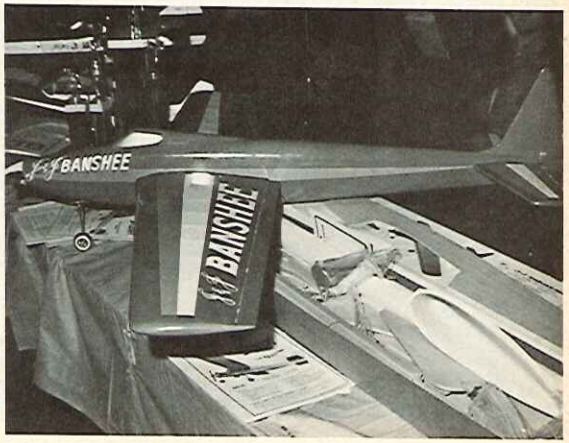
TOP ROW, LEFT: KP40Q, Dave Gierke's (W. Senega, N.Y.) First Place winning Pylon Racer. RIGHT: Super Stearman by Frank Evans and Tom Dietrich (Ontario, Canada) took 2nd in Non-Military Scale. CENTER ROW, LEFT: A modified Mach I won 2nd in RCM Trophy competition for Phil Fuller (Maumee, Ohio). RIGHT: Dave Platt's (Chicago, Ill.) Me-109, 2nd in Military Scale. BOTTOM ROW, RIGHT: Panterna X9, Gerry Worth's (Illinois) 2nd place Original Design winner. FAR RIGHT: A Douglas M2 by Bob Wischer (Delafield, Wisconsin) 1st in Non-Military Scale.

who is always around when there is work to be done. We could all use a few more members like him.

The Toledo Conference has grown far beyond the imagination of those who started it some 18 years ago. As it exists today, would have been considered totally impossible. No small R/C Club could possibly manage such an enormous operation. Yet, each year, as the Conference grew, the Weak Signals DID manage it, and manage it well. Working in tight quarters, handling crowds of 8-9000 or more, constantly busy, yet always pleasant and ready to offer any assistance that might be needed. The Toledo Conference is not only a tribute to the Weak Signals Club, but also to the entire hobby, for it demonstrates vividly the spirit and



TOP ROW, LEFT: Exciting Whirlybird 505 from Du-Bro Products (see March 1972 RCM). RIGHT: The Dieter Schluter Huey Cobra — tremendous! CENTER ROW, LEFT: Kavan's Bell Jet Ranger from Model Rectifier Corporation. CENTER: R/C Modeler Magazine's Executive Editor, Pat Crews, with RCM Basic Trainer. RIGHT: New foam Cessna Cardinal from Midwest Products. BOTTOM ROW, LEFT: Corsair II from R/C Kits. RIGHT: J & J MODELS kit of Jersey Jim Martin's contest winning Banshee.



TOLEDO '72

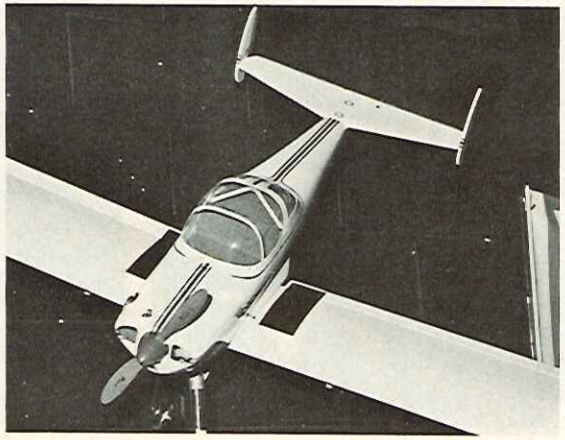
power to do things that can be generated within a group of dedicated RC'ers. Think of what could be accomplished – IF WE WOULD ALL PULL TOGETHER!!

To the Conference Directors Don Belote and Bob Hisey, and all of the members of the Weak Signals Club who helped to make the whole thing possible: Our Countless THANKS.

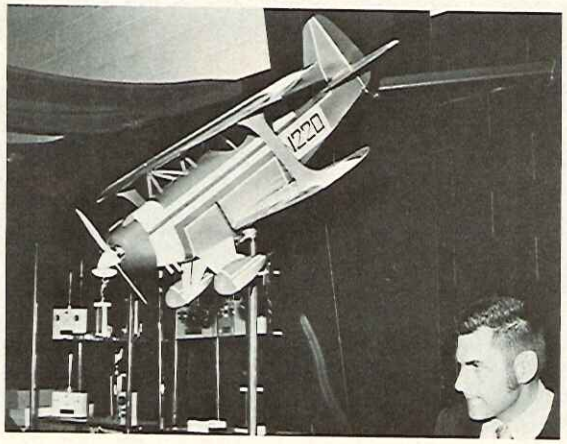
To all those manufacturers whose picture does not appear: Two SORRY's and one OOPS!

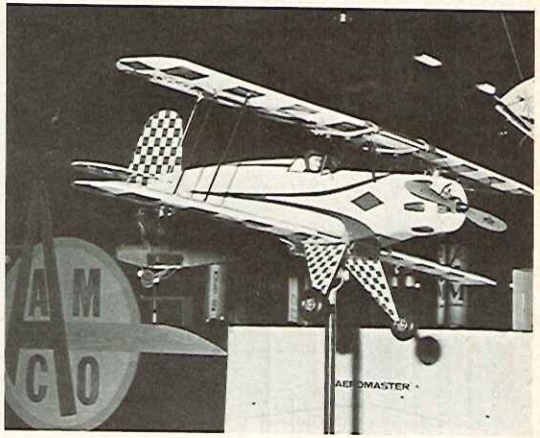
To those of you who missed it: Start planning NOW to be at next year's Conference, February 26 and 27, 1973.

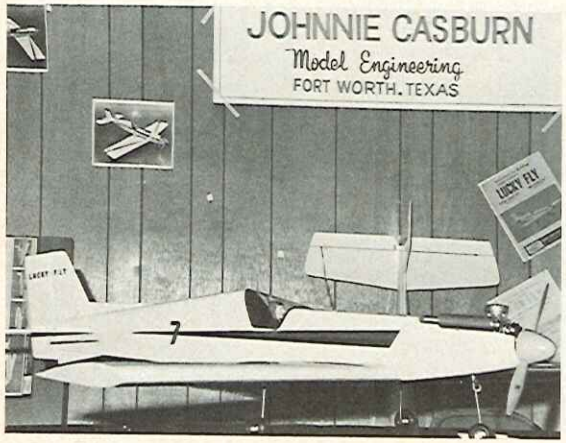
SEE YOU THERE ..... □



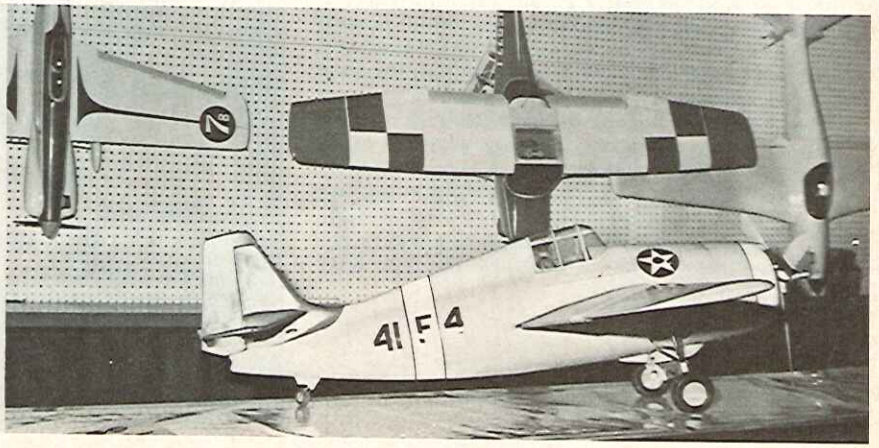
TOP ROW, LEFT: Joy Products 'Aeronca C3'. RIGHT: A new addition to this years conference was lovely Darlene Hembree, Miss Weak Signals. We protest! Miss Toledo Conference . . . maybe? Miss Weak Signals . . . NEVER! Darlene holds prototype VK Models Sopwith Camel. CENTER ROW, LEFT: Carl Goldberg's P-40 profile R/C. CENTER: Vic's Custom Models Ercoupe. RIGHT: Strato 210, a balsa kit from Warehouse Systems, Inc. FAR LEFT: Sterling Models new Fledgling Trainer. LEFT: VK's newest addition, a Corben Super Ace.



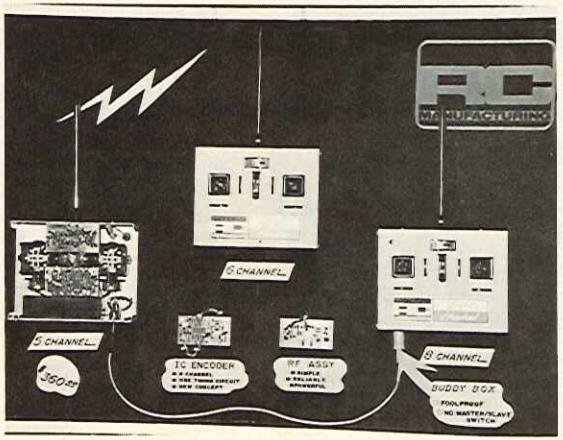




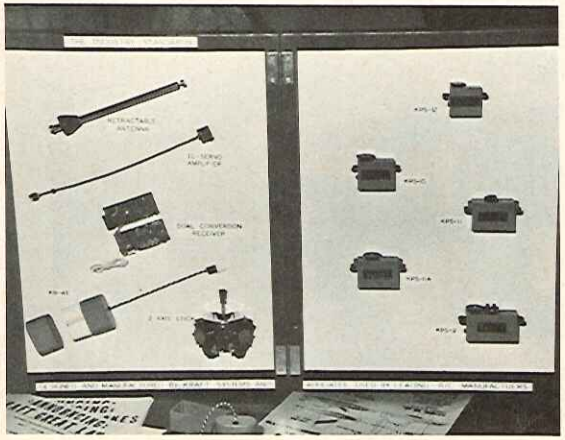
TOP ROW, LEFT: Fournier RF-4D in colors of Phil Kraft's full scale ship. CENTER: Ron Murray and scale kit trom Royal Products. RIGHT: A few modifications to AAMCO Aeromaster produces a Bucker Jungmeister. CENTER ROW, LEFT: Len Purdy with new Lanier Invader. CENTER: Impressive wood and foam Tigertail kit features framed fuselage and wood covered foam wing. RIGHT: Vicki Collins with Aero Precision Focke Wulf featured in April 1972 RCM. BOTTOM ROW, LEFT: Lucky Fly from Johnnie Casburn. RIGHT: A wide range of scale kits from Scale R/C Products.

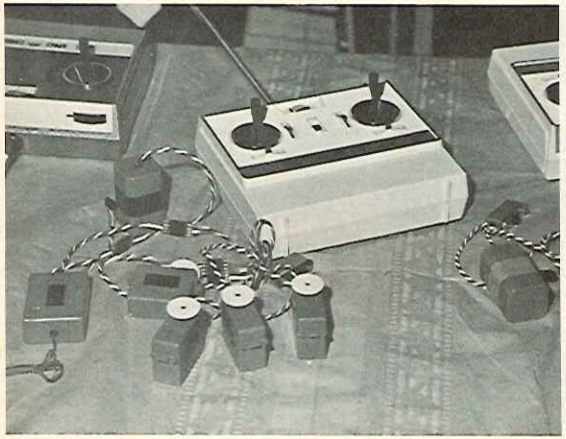


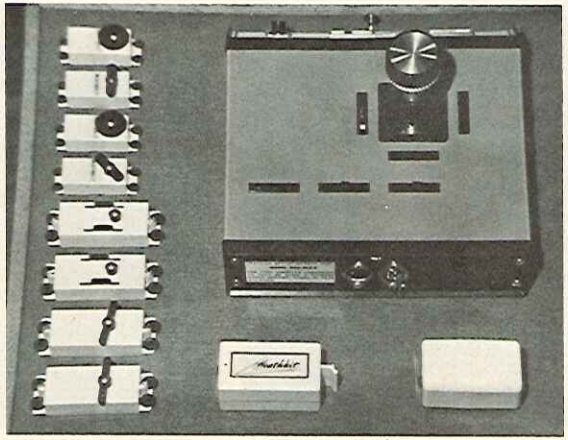
TOLEDO '72

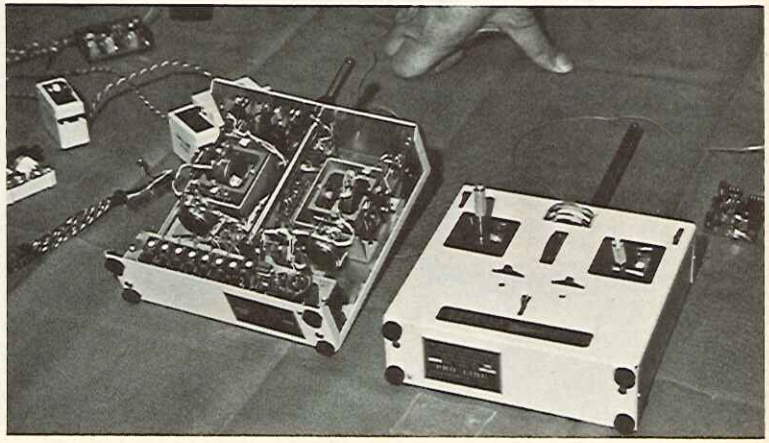


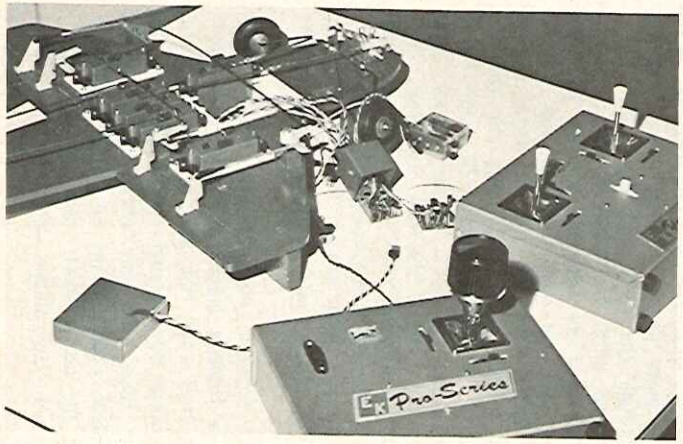
FAR LEFT: Attractive Classic sets from Royal Products. LEFT: Impressive display outlines features of R/C Manufacturing 800 system designed and produced by Ed Thompson. CENTER ROW, LEFT TO RIGHT: Industry Standards display by Kraft Systems. Typical parts display of World Engines Blue Max "semi-kit." Orbit Systems new for '72, new ownership. Jim Martin explains features of Hobby Lobby 5, not the least of which is its $209.00 price tag! BOTTOM ROW, LEFT TO RIGHT: Space Commander System from Micro Craft Corp. New Heath 8 features smaller RX, beautifully designed TX. Pro-Line, sleeker and trimmer for '72, refined circuitry.

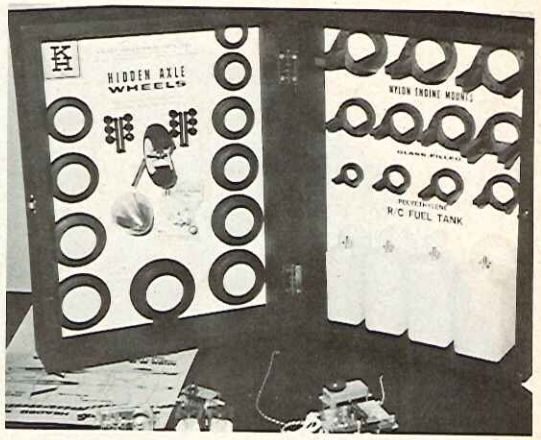


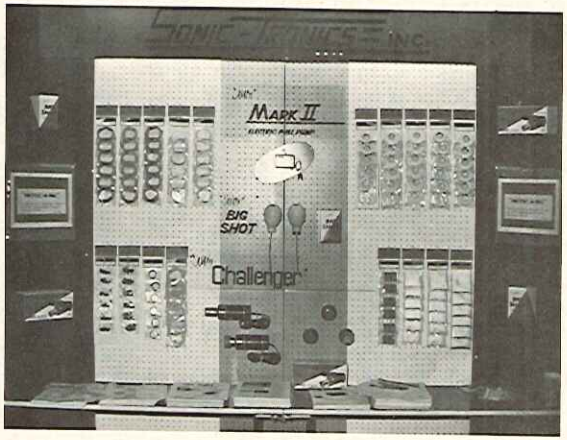








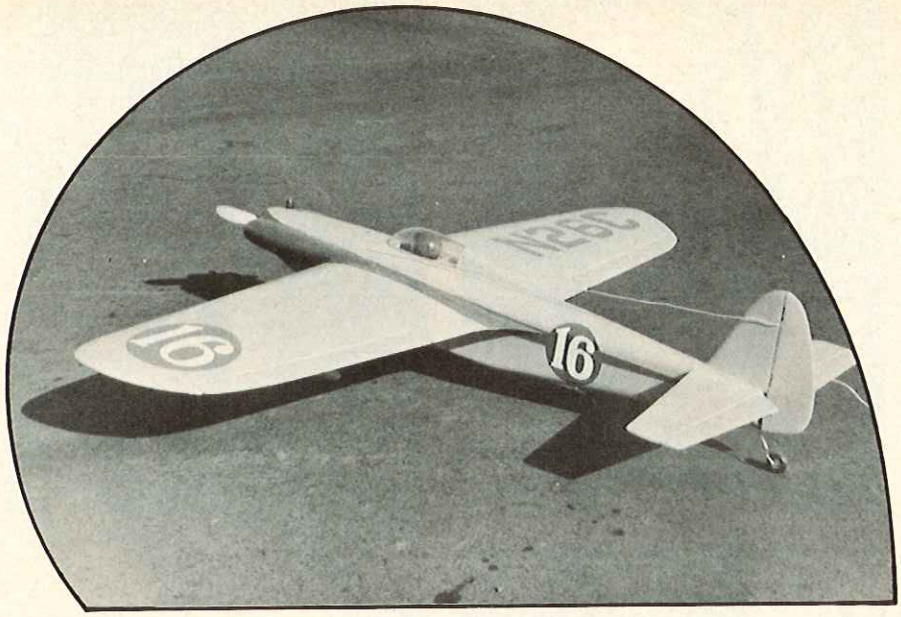




TOP ROW, LEFT TO RIGHT: EK Products Pro Series - - - smooth, tight, and reliable. Exciting Olympos Air Brush available from Model Rectifier Corp. goes where you go. A professional quality unit. This new item from John Tatone simplifies hinge slot positioning and cutting. New from Kraft-Hayes are these excellent hidden axle wheels. CENTER ROW, LEFT TO RIGHT: Bob Reuther of Hobby World proudly displays new line of miniature machinery. Sonic-Tronics, an excellent line of R/C products. Gerry Gerondale, Fabra-Tex Corp., demonstrates strength of new Prime Filler! Camera catches ball on rebound after being thrown on concrete floor! Sands like chalk! FAR LEFT: Maco's Jet Star kit. LEFT: Indy R/C Specialities stock most everything in R/C.

SHOESTRING

FRED REESE'S SUPER-FAST QUARTER MIDGET RACER CAN BRING THE HARDWARE HOME FOR YOU.



The "Shoestring" design is based on the wing concept by Don Dombrowski of using two fiberglass arrow-shafts for both structural strength and as the wing building jig. As you know, building a lightweight, thin, tapered wing that is straight, can be difficult. Sheeted foam is not foolproof and is much heavier than our built-up wing. Don's experience with Formula I wing design gave us the symmetrical laminar wing root section but it took 3 wings to decide on the tip airfoil. After trying some thinner sections, the 2410 was selected for its high lift and low stall speed characteristics. The result is a wing that will not snap out of a tight turn, yet has very little drag for top speed potential. Landings are not difficult as the plane can be slowed down without fear of stalling.

Another advantage of this wing design is non-sensitive aileron control, especially around neutral. This means smoother flying and fewer course corrections and the resultant loss of speed.

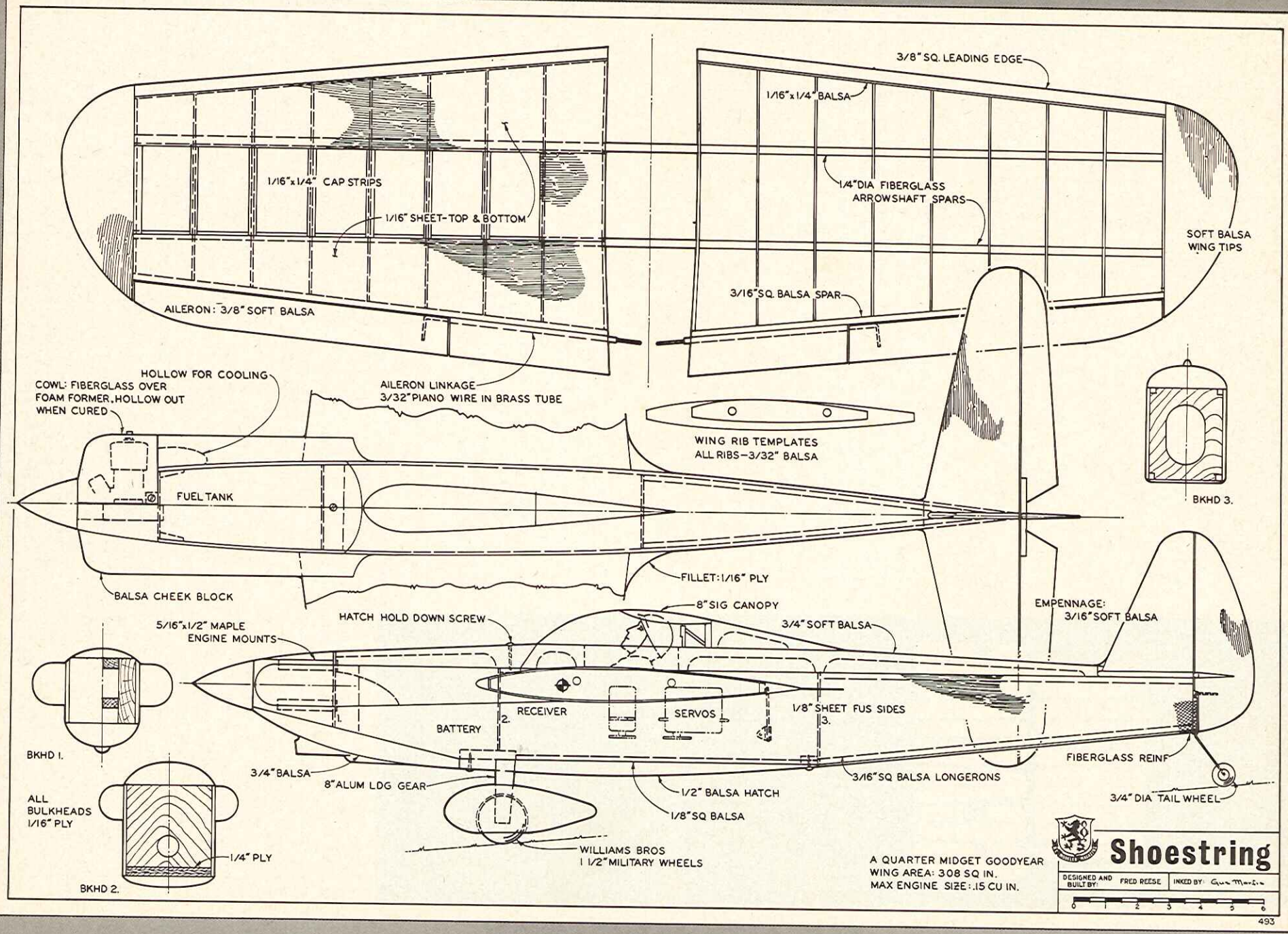
The long nose and tail moments allow plenty of room for the fuel tank and the battery pack and result in less sensitive elevator control when combined with the forward CG location. In fact, the airplane takes a little time to get used to at first because it is less sensitive than most pattern ships, yet it flies much faster.

Construction goes very quickly once the basic parts are cut out, but some time and care must be taken to get the wing ribs and the shaft holes accurately aligned.

Begin by making a 1/16" plywood wing root and tip rib templates with the ¼" holes for the arrow shafts. Stack seven pieces of 3/32" balsa between the templates and drill two ¼" holes through the stack and then bolt together with ¼" bolts. Now carve and sand until the stack of ribs is finished. Repeat for the other side of the wing by reversing the tip and root to give a right and left wing panel. Lay each rib over the plan and trim the leading and trailing edge. Make two 3/32" root and tip ribs from the plywood rib templates. Cut out the two fuselage sides and, using the root template as a guide, drill the two holes in the fuselage sides. Cut out the firewall, the two bulkheads, and the 3/16" sq. and 1/8" sq. strip stock. Glue the strip stock to the fuselage sides and then epoxy the two bulkheads into place. Pull the tail together and then epoxy the firewall into place. Use 5-minute epoxy so that you can hold each joint until set so that the fuselage is straight.

The yellow Crawford arrow shafts are not long enough for the wing but they can be lengthened with a dowel plug, epoxy, and another short section of arrow shaft.

Before sliding the shafts through the fuselage, mark the rib locations on the shafts and open up the holes in the fuselage sides slightly so that the shafts will slide through freely. Slide the two root ribs and the tip ribs onto the shafts and, using Hobbypoxy II or other slow drying epoxy, glue the root ribs only and the shafts to the fuselage. Wipe away any excess epoxy oozing out around the root ribs. Place the airplane upside down on a flat surface and put pieces of 1/4" sq. balsa under the arrow shafts near the tips and the root and leave until the epoxy has set. Use blocks, tape, and pins or whatever, to make sure that . . . . . to page 78


3/8" SQ. LEADING EDGE
1/16"x1/4" BALSA
1/16"x1/4" CAP STRIPS
1/16" SHEET-TOP & BOTTOM
1/4"DIA FIBERGLASS ARROWSHAFT SPARS
SOFT BALSA WING TIPS
AILERON: 3/8" SOFT BALSA
3/16"SQ. BALSA SPAR
HOLLOW FOR COOLING
COWL: FIBERGLASS OVER FOAM FORMER. HOLLOW OUT WHEN CURED
AILERON LINKAGE 3/32" PIANO WIRE IN BRASS TUBE
WING RIB TEMPLATES ALL RIBS–3/32" BALSA
BKHD 3.
FUEL TANK
FILLET: 1/16" PLY
BALSA CHEEK BLOCK
8" SIG CANOPY
HATCH HOLD DOWN SCREW
3/4" SOFT BALSA
EMPENNAGE: 3/16" SOFT BALSA
5/16"x1/2" MAPLE ENGINE MOUNTS
RECEIVER
SERVOS
BATTERY
1/8" SHEET FUS SIDES
BKHD 1.
3/4"BALSA
8"ALUM LDG GEAR
1/2" BALSA HATCH
1/8"SQ BALSA
3/16"SQ BALSA LONGERONS
FIBERGLASS REINF
3/4" DIA TAIL WHEEL
ALL BULKHEADS 1/16" PLY
1/4" PLY
BKHD 2.
WILLIAMS BROS 1 1/2" MILITARY WHEELS
A QUARTER MIDGET GOODYEAR
WING AREA: 308 SQ IN.
MAX ENGINE SIZE: .15 CU IN.
Shoestring
DESIGNED AND BUILT BY: FRED REESE
INKED BY: Gus Morris
493

AIRFOIL SCALING

Have you ever wanted to expand or reduce the size of an airfoil? Have you ever wanted to increase the thickness of a section without changing its chord length? Here's how . . . . .

BY WILL D. MITCHELL

Have you ever wanted to expand or reduce the size of an airfoil? Have you ever wanted to increase the thickness of a section without changing its chord length? If so, try my quick and highly accurate technique of Airfoil Scaling. Here are just a few of its uses.

RCM, in its monthly pages, prints scores of sets of miniature plans, often containing tantalizing airfoils and other shapes. If the full size set of plans happens to be just the size you need for your next experimental class ship – fine. But if not, Airfoil Scaling will convert the plan on the page to just the size you need.

A current rage is the miniature version of a successful .60 pattern ship. Since Airfoil Scaling is not limited to any size or shape, you can scale down planforms, side views, and fuselage formers, as well as airfoils.

Pylon rules limit wing thickness, among other things. There are many excellent speed airfoils that are, unfortunately, just a little too thin. But now, in five minutes or less, you can increase the thickness of any section by, say 4% or even 7.29%, if that's your bag.

You can even go from Metric to inches. I recently scaled a 24.5 centimeter section (close to, but not exactly, 10 inches) down to 8 inches. The measurement system used has nothing to do with this technique. Try that with graph paper!

I once spent two weeks plotting 47 different rib outlines for an elliptical wing sailplane I didn't build! Last month I re-plotted all 47 ribs in a short afternoon, and corrected a dozen or so errors ranging up to 1/16".

Interested yet? Feast your eyes on this rash sounding true statement. Accuracy to a split-hundredth of an inch is possible!

You could even make a line drawing of your wife, and take off ten pounds at the same time. That might just get you that new radio for your birthday.

Like many things, the product desired determines the equipment to be used. A French curve is handy, but not absolutely essential. Cheapies in the dime store cost a quarter, and a draftsman supply store will sell you one that fits any need for a couple of dollars. A schoolboy's drawing compass will do for measuring, but a $3.00 set of draftsman's dividers are needed if you want to split hairs. An ordinary ruler is reasonably straight, but the draftsman's rule is better. And even the pencil contributes. For your best efforts, buy a hard lead pencil, and sharpen it to a needle point on a scrap of 400 grit sandpaper. Then you can split those hundredth inch marks in half!

Here is the technique, in great detail. After you have done a couple, an airfoil takes just under five minutes. Watch the example as you read.

(1) Trace the pattern airfoil at the top of the page. Use an old rib, a photo, plans from RCM, anything. Then draw in the chord line, from L.E. to T.E.

(2) Pick a convenient point near the bottom center of the page (Point A) and draw lines through the pattern. Use more lines where there is a greater curvature. One line must pass through the leading edge, and one through the trailing edge.

(3) Set your dividers to the exact length of your new scaled airfoil. Draw the chord line of the scaled airfoil. This line must be parallel to the chord line of the pattern, and the lines passing through the pattern's L.E. and T.E. must also pass through the scaled section's L.E. and T.E. The dividers help you accurately position this chord line.

(4) Pick a convenient segment on the pattern's chord line, (#1). Use the dividers to measure off a vertical line exactly this length, near the bottom of the page.

(5) Find the corresponding segment on the scaled airfoil's chord line, (#2) and use the dividers to transfer this length to the vertical line. Measure up from the bottom of the line.

(6) From a convenient point (B) draw lines to the ends of #1 and #2. You have just drawn the scaler.

(7) Now for the actual plotting. Use the dividers to measure off the various distances from the pattern's chord line to the airfoil surface, along the lines from point A. For instance, segment #3.

(8) Transfer each segment to the scaler, measuring vertically, and pick off the new scaled distance, example #4.

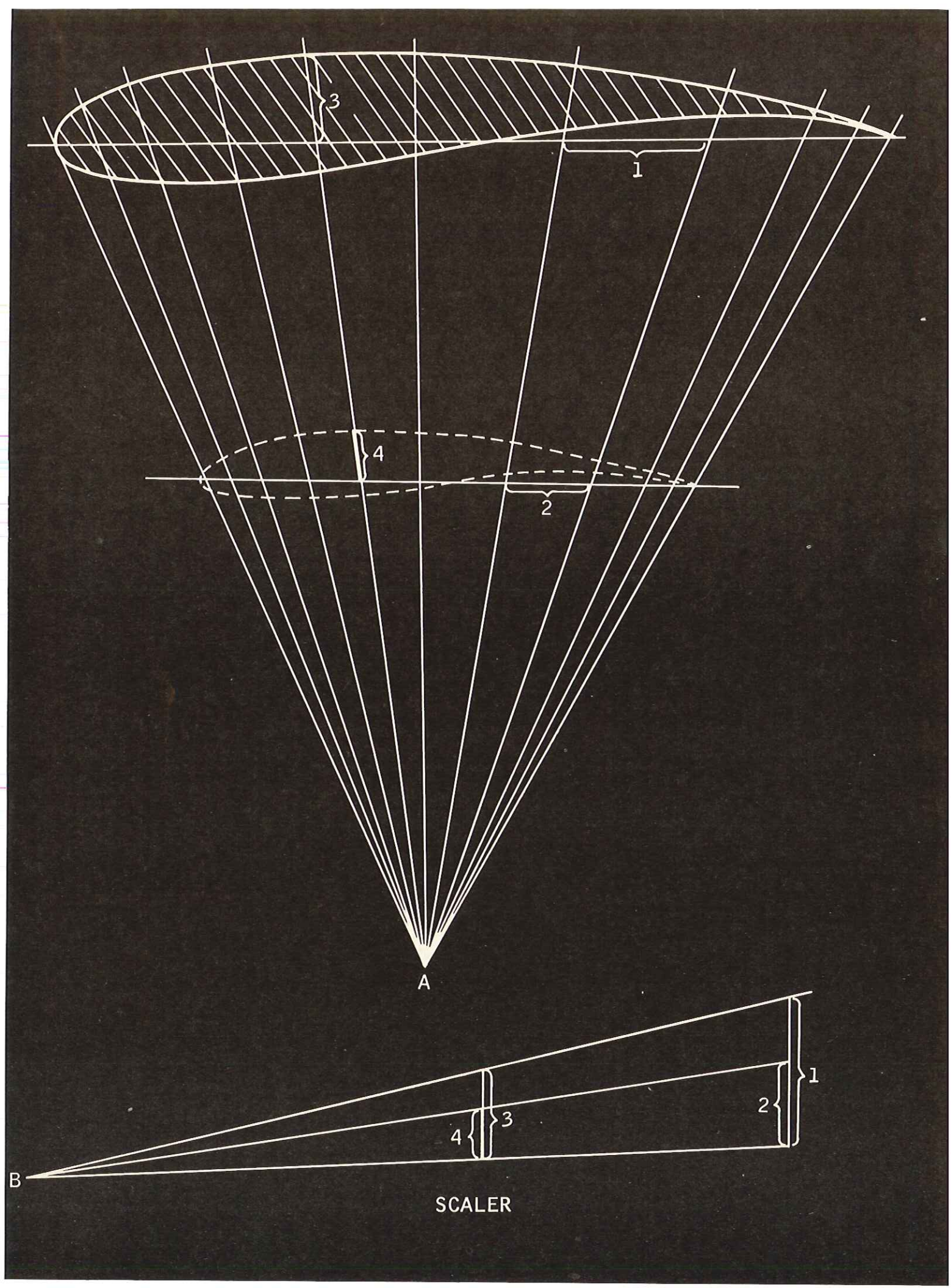
(9) Transfer the new distance to the scaled airfoil, and plot that point. Do the same for every point a line from A touches the pattern airfoil. If you need greater accuracy in a particular area, draw more lines radiating out of point A.

(10) When through, connect all the points with your French curve.

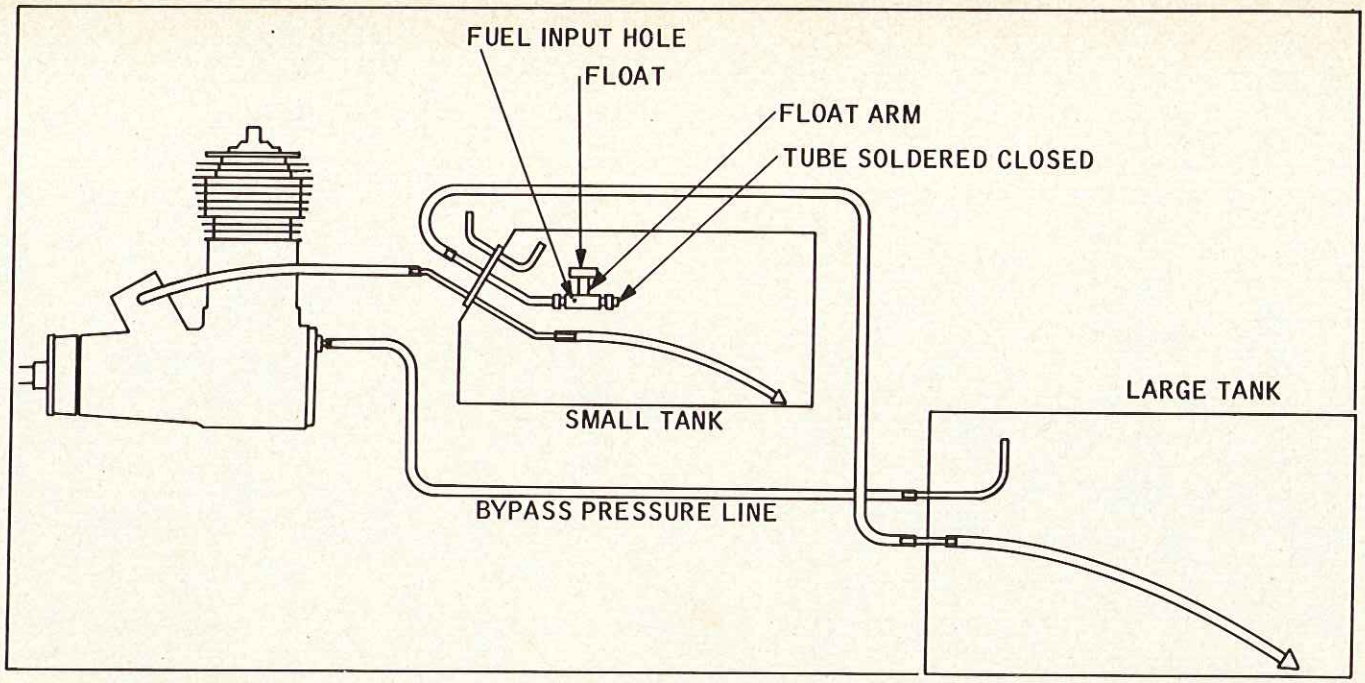
You have just scaled down an airfoil. To scale one up in size, simply place the pattern in the center of the page, and the scaled section at the top.

To change the thickness without changing the length, construct the scaler a little differently. The thickness of the pattern airfoil, at its thickest point, replaces distance #1 on the scaler. And the desired thickness replaces distance #2. If the two airfoils are equal in length, you can either plot the second one right over the pattern, or use carbon paper when you draw the rays from point A and the chord line. Then the second airfoil may be plotted on the carbon copy.

And, it's no trick to increase thickness while decreasing length, if you ever want that. You might try that on a fuselage some day. □



SCALER



A SIMPLE FUEL TANK FLOAT VALVE

FOR CONSTANT FUEL FEED AND CONSISTENT ENGINE RUNS DURING CROSS COUNTRY CONTESTS REGARDLESS OF TANK PLACEMENT

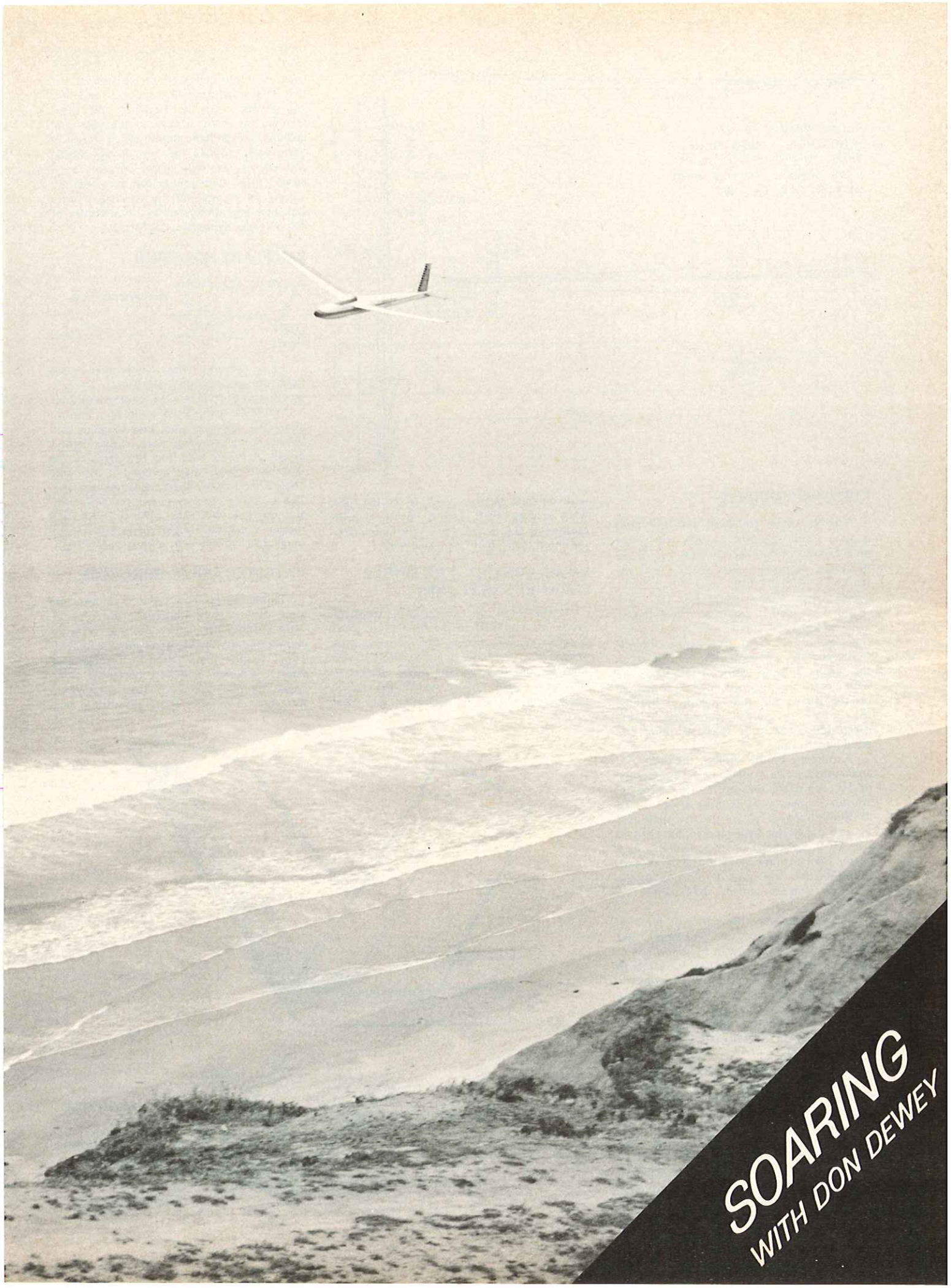
BY MAJOR BOB HARKEY

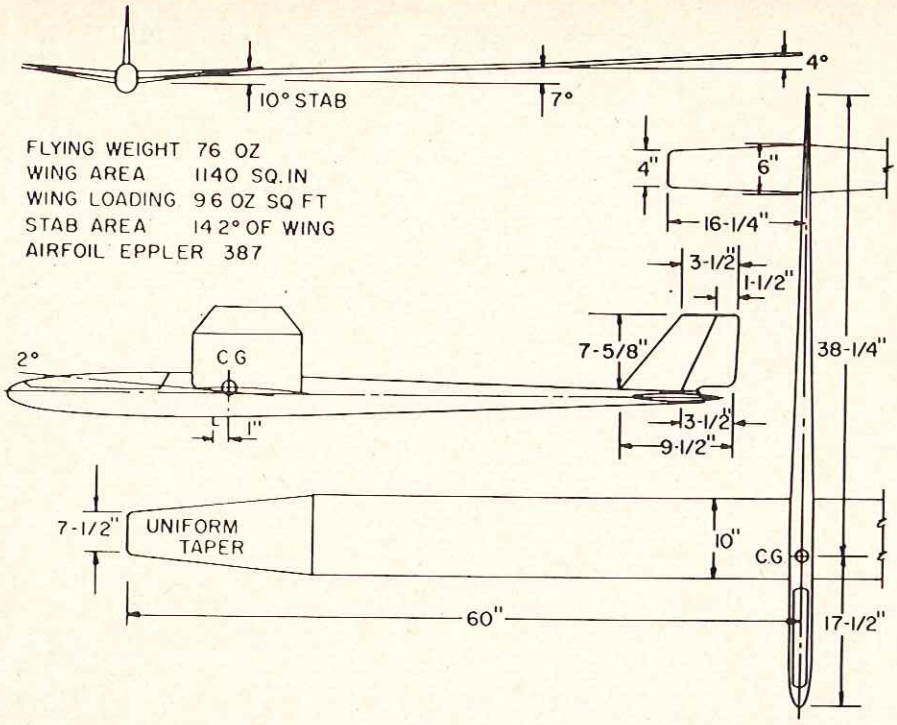
There have been many arrangements for fuel tank placement and fuel feed for endurance and cross country aircraft. Here is one that will allow normal needle valve settings, provides constant fuel flow, and permits varied possibilities for fuel tank placement. The secret of this system is to use by-pass pressure off the engine to force fuel from a large tank into a small tank at needle valve level and to use a float valve in the small tank to control the fuel flow. The problem with this system in the past has been the development of a small dependable valve. I believe I've solved this problem and, basically, the system works like this – bypass pressure from the engine pressurizes the main or large fuel tank, thus forcing fuel into the small tank via the float valve. As the small tank fills, the float valve closes and cuts off the fuel flow into the small tank. The small tank is vented and the engine runs merrily along as though it was being fed from an almost constant level fuel source. As the fuel level in the small tank drops, the float valve rotates, the two holes in the float valve tubing coincide, and fuel again flows from the large tank into the small tank. Actually, the float valve is in constant movement due to vibration, however, the fuel level in the small tank remains relatively constant.

Construction of the float valve is simple. The inner section is 1/8" brass tubing while the outer section is 5/32" tubing. These two sizes provide a good slip fit and, when fuel, with its castor oil lubricant, flows through the valve, a very air tight seal is obtained when the valve is in the "off" position. The size of the hole in the valve is not critical but should not be any larger than necessary to provide smooth fuel flow. The size of the hole will obviously depend on the size of the engine. Start with a hole about the size of an ordinary pin and, if the small tank drains during engine runs, enlarge the hole until a constant fuel level is maintained in the small tank. The float arm and float, itself, can be made of several materials; in my case the arm was a piece of small diameter brass tubing which has been flattened, and soldered to the rotating 5/32" tubing. The float was made from a chunk of balsa which had been fuel proofed and fastened to the arm with epoxy.

The float valve assembly was built on the back of a plug which fits the Sullivan slant style tank (6 oz. in my case). By careful construction (trial and error), the float valve can be worked into the tank through the hole. The plug is installed, tightened, and you're ready for hookup.

The float valve system was initially tried by pressurizing the entire system, however, needle valve settings were critical. By pressurizing only the large tank and venting the small tank, needle valve settings are broad and a constant fuel level is maintained, thus insuring a consistent engine run. I have used this system several times over the past year during cross country contests and it has worked perfectly. If allowed, the system will drain both tanks dry to the last drop. □


SOARING
WITH DON DEWEY



KURWI 68 MODIFIED

The Kurwi 68 Universal with the 139" wing is a fine sailplane as indicated by the performance of Paul Byrum and other ECSS members. Although I had never flown my Kurwi 68 with the 139" wing, I had used a shorter span Kurwi wing. For the 1971 season I decided it would be interesting to try a wing having greater area and an airfoil that would allow for reasonable thermal flying as well as good penetration. Based on the results of some work of two years ago with a foam and plywood covered wing used on the Kurwi for slope soaring, I decided the Eppler 387 airfoil should be a good compromise for both thermal flying and good penetration.

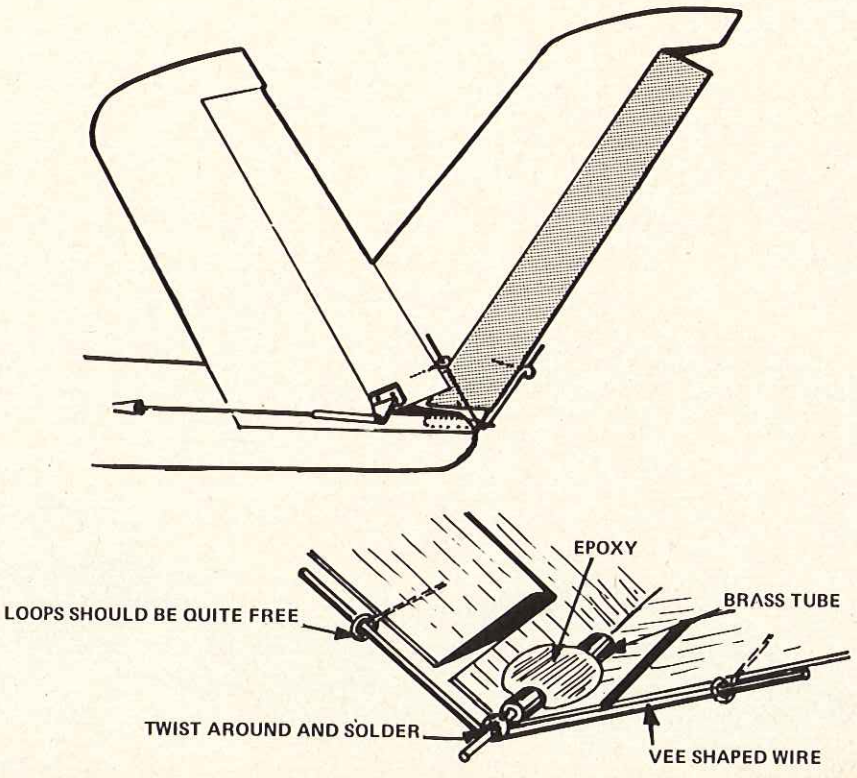
As shown in the sketch, the wing is a conventional two panel unit having a span of 10' and using the regular Kurwi tongue and box joiner. Wanting more area, I used a uniform chord of 10" for the first three feet of each panel and then tapered the last two feet to a tip chord of 7½". Hoping for a better tight turning characteristic, 4 degrees of polyhedral was used in addition to the basic 7 degrees already built into the tongue.

I have been very pleased with the final results of this configuration. The Eppler 387 airfoil does a good job in light lift conditions as well as providing penetration in winds of 30 mph on the slope. This sailplane was used last summer to make a 46 minute thermal flight one day and a 2 hour and 7 minute slope duration flight the next day for the Level III requirements of the League of Silent Flight.

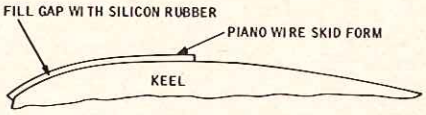
I believe the polyhedral has improved the tight turning characteristic. At least the sailplane can make surprisingly tight circles when necessary to stay within a narrow column of lift. Using one of Herschel Terry's adjustable tow hooks, I found the best position for the hook to be about 1" forward of the CG. On calm days I have moved this hook directly under the CG with good results. The total weight of this modified Kurwi including a Thermic Sniffler, with separate battery pack, is 4¾ lbs. The wing loading, then, comes out to a quite reasonable 9.6 oz./sq. ft. . . . by Don Clark, reprinted from the ECSS *"Sailplane"*.

V-TAIL CONTROL FOR SINGLE CHANNEL SAILPLANES

Rather than run two pushrods from the servo (or actuator) to the flippers on small V-tailed models, it is possible to save a little weight by running a single pushrod to one control, and then get the other control to move by a small linkage system. Our sketch shows one scheme. A vee-shaped wire, bent to the same angle as the tail, is soldered to another wire which is free to rotate inside a scrap of tubing epoxied to the base of the tail. Two pins, bent into loops at one end, are pushed into the flippers, and these restrain the ends of the vee-shaped wire. Pushing the left hand flipper up, as shown in the sketch, rotates the wire in the tubing and causes the right hand control to go down. Trim adjustments can be made by closing up or opening the vee-shaped wire. This idea was submitted by J.W. Headley of Palos Verdes Peninsula, California.



SAILPLANE NOSE SKID



Larry Osborn, being a newcomer to the field of soaring, was stuck for an easy solution to the problem of making a skid for his recently completed sailplane. He hit upon the idea for the easy-to-make skid shown in the drawing. Larry simply bent a length of piano wire into the shape of the skid he desired, then epoxied it into two holes drilled under the keel of the sailplane. The resulting space between the wire form and the keel was filled with G.E. Silicone rubber. When the rubber cured, Larry had a tough and flexible skid with a steel surface.

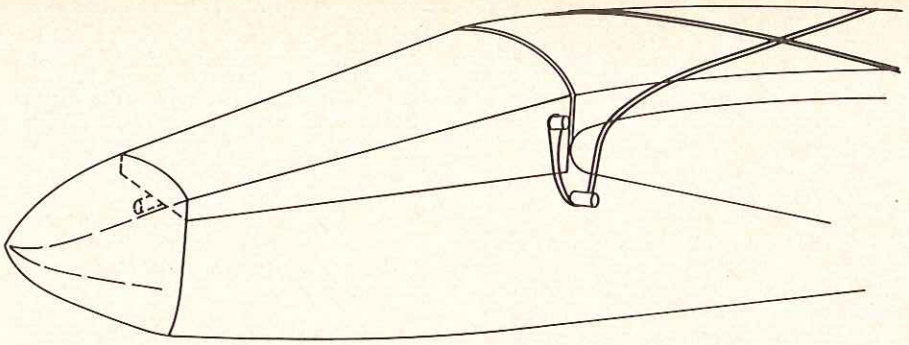
MATCHING WHITE MONOKOTE

Thomas Ingram of Dolton, Illinois, had some difficulty in matching the color of white MonoKote when he was recently completing his Cirrus. After some searching, Tom found that DuPont "refrigerator White" Enamel matched perfectly. Two coats, thinned out about 30%, sprayed on wet about 5 minutes apart, flowed out very

nicely and dried like a mirror. Tom followed up with two coats of wax two days later and now even a fly can't hang on to this surface of his Cirrus.

CANOPY HOLD DOWN

Gary R. Signor of Burlington, North Carolina, submitted the attached sketch illustrating his method of securing the cowl block on a Snipe II glider. The first pair of criss-crossed rubber bands pulls both the wing and the cowl into position. There are no small fastener pieces to misplace and the method gives some degree of "give" in the event of severe impact.



SAILPLANE HOLD DOWN

When I recently received two colorful bean bags joined together with a length of 18" cord in the mail, I thought somebody was surely kidding! As it turned out, this was one of the most useful accessories a sailplane pilot can have in his field box. Sent to me by R.C. Anderson, of Concord, California, these two bean bags, filled with sand, are set over the wing on the windward side of the sailplane so that your wing will no longer blow up and flip your aircraft over during gusty winds. If you prefer, one set could be used on each wing or, alternately, they could cross the wing and the fuselage. We have used these at RCM and have found them to be excellent for keeping the sailplane on the ground where, otherwise, it could sustain damage from gusty winds.

V-TAIL OLYMPIC

Dale Nutter's Olympic 99 V-Tail with T.D. .049 power pod and Logictrol 5. Weight 40 oz. with pod. Red Solarfilm finish with Plum Crazy MonoKote trim!

Dale Nutter of Tulsa, Oklahoma, well known RC'er and former record holding speed merchant, is currently active in the R/C soaring field. In fact, Dale notified us that he has just sent in his Level I LSF papers only one week after receiving them. Dale mentioned that they have a small, but well shaped, slope in Tulsa and he did all of the aerobatics claimed for the Gryphon (kit from Model Dynamics) except true spins. Since their slope is only 75-100 feet high, this maneuver would be quite difficult. The stability and control response of the Gryphon is good according to Dale, the kit being the best he has seen. Dale suggests a thinner M-6 airfoil for the Gryphon, which should be more efficient for racing, as well as requiring less control deflection for down elevator response in rolling and inverted maneuvers. As many of you may recall, Dale used this airfoil very successfully in his Chaparral AMA Pylon Delta several years ago. Dale completed his LSF Level I spot landing requirements with only 11 attempts on the Gryphon, the closest landing being 11" from the spot.

As shown in the photographs, Dale also has an Olympic 99, kitted by Airtronics, which was modified by coverting it to a V-tail using the kits stabilizer and 2" wide elevators. Dale made this change in an attempt to increase the control response, with the result that this configuration responds almost like ailerons to small increments of stick deflection. The weight and drag savings and tight turning ability make it possible to stay up 4-5 minutes on very light ground level thermals frequently below 50' altitude. Dale mentions that his best times to date are 14 minutes, 2 seconds, from a can winch launch and 19 minutes, 42 seconds, with a TD .049 power pod.

CUTTING RIBS FOR A TAPERED WING

Writing in his column in the ECSS "Sailplane," official bulletin of the East Coast Soaring Society, Ray Smith mentions that the average builder looks at a 10' wing with ribs 2" on center and says he couldn't possibly cut out that many ribs. A quick count, and you come up with about 62 ribs with only 2 of each size alike! To plot that many templates and cut out 2 of each size is quite a chore.

As Ray mentions, there is a simple way. First, cut out a number of balsa slabs the thickness of the ribs. Cut enough of these pieces equal to the number of ribs on one panel. Now, make two metal templates of 1/16" aluminum sheet; one template must be the size of the root rib while the other is the size of the tip rib. Pile all the pieces together and put a template on each end of the stack. Run several pins through holes in each template into the stack of ribs. When you feel it is good and solid, start cutting off the excess balsa outside of the template. The three inch X-Acto blade is best for this. When you get close, use a sandpaper block to smooth up the ribs. When this is accomplished, mark the location of the spars. Cut the lines with a Zona saw down to the proper depth and chip the pieces out with a knife. A little smoothing up with a file and the spar slots should be exact on each rib. Repeat the same thing for the other panel.

Ray mentions that he likes wings with a straight center section and tapered tips. In this case, cut the proper number of ribs for the center section using two templates of the same size. Use a different size template for the tapered section. You can also cut a recess to receive the front sheeting back to the trailing edge. This may sound like a lot of work, too, but it really isn't. Using a long strip of 1/16" x 3/16" balsa, cut the end off square. Put the square end up to the sheeting and bend the cap strip down to the trailing edge and cut it part way through with the X-Acto knife. Finish the cut with a strip on a block of pine. Don't glue any in place until all are cut. When you are ready, spread glue on several ribs and pin the cap strips into place. If you don't use cap strips, the exposed edge of the rib will be at a slight angle. Simply make allowance for this and sand it down after the wing is built. As Ray stated, he can build a 12' wing in about 4 nights using this method. If this still sounds like a lot of work, try foam and fiberglass - - - it really is quick!

THIRD ANNUAL SOARING NATIONALS

To be held in conjunction with the 1972 National Model Airplane Championships, the Third Annual Soaring Nat's will be held Sunday, Monday and Tuesday, July 23-25. Events will include Scale (documented) qualifying flight prior to static judging; Thermal Duration in two classes – Standard and Open. Standard Class is for sailplanes with a wing span of 100" or less while the Open Class is for any size wing span above 100". Contestants will be allowed to enter one class in addition to Scale. One back-up ship will be permitted in the same class but no back-up ship will be allowed in Scale. There will be no age classes and the event will be a combined junior-senior-open event. Rules are based on AMA provisions as proposed by the League of Silent Flight. The entry fee is $5.00 and the launching method will be by electric winches. For further information, send a stamped, self-addressed envelope to the Soaring Nationals, c/o Dan Pruss, C.D., Box 49D. Plainfield, Illinois 60544.

M.A.S.S.

On January 29, 1972, the Mid America Soaring Society was born. This event was but one of many important milestones established at a meeting of sailplane enthusiasts held at the Hayden Haus Restaurant in Council Bluffs, Iowa. The organization will be called the Mid America Soaring Society and membership will not be geographically restricted as the organization is open to all sailplane enthusiasts, from Canada to Mexico between the Atlantic and Pacific Oceans. The organizational government will be a council composed of two members of each

sailplane club which desires to affiliate. This method will be representative, yet allow a reasonable working group. All council meetings will be open to all the general membership as may desire to attend. As a body it will represent M.A.S.S. and only those represented by a member have the power to replace or remove that member.

M.A.S.S. will join the East Coast Soaring Society (ECSS) as a body and will ask for and extend reproduction rights in items contained in each others Newsletters provided due credit is given. M.A.S.S. will also support the League of Silent Flight (LSF) and encourage all individuals to participate in the LSF Levels of Achievement. This is to take advantage of the tremendous quality and quantity of organization already done by the LSF, all of which relates to the full sized sailplane action. M.A.S.S. will require all members to be currently paid up AMA members and holders of valid FCC licenses. This action is taken in the light of the fact that, by so doing, the organization will take their place in the ranks of responsible modelers throughout the United States and add to the brotherhood of the R/C modeling fraternity. M.A.S.S. will also conduct at least 12 soaring contests throughout the summer flying season. To begin with, these contests will be held Saturday afternoons from 1 P.M. on and will be designed to give each entrant at least 3 chances to fly. To the entrant, the only noticeable difference will be the organized flying order. The actual events held will be decided at a future Council meeting. A possibility is to lean toward the Nationals schedule until mid-July, then revert to various other tasks or to mix both all year long.

The primary objective of M.A.S.S. is to build individual sailplane flying proficiency. This will allow each member to learn collectively, to teach all who are interested and as a group, and to provide a base for the really good fliers to build on and to be true national champions. A secondary objective of M.A.S.S. is to assemble the best possible team to represent sailplane enthusiasts at the Nationals and other National team competitions. The M.A.S.S. schedule will provide this method by simply tabulating the results of their scheduled contests. Those interested in this organization are urged to contact Jim Simpson, 2736 Ellsworth, Omaha, Nebraska 68100.

LSF 1972 R/C SOARING TOURNAMENT

The League of Silent Flight 1972 R/C Soaring Tournament is scheduled for August 26-27, at Mile Square Recreational Park, Marine Corps Helicopter Air Station, Fountain Valley, California. The host club will be the San Fernando Valley Silent Fliers. SFVSF President Jack Seeley is Tournament Director. Le Gray, LSF President, is Contest Director. Details will be released in RCM as they are firmed up.

While we're on the subject of the LSF, this organization is just over 2 years old now, and "healthy and happy" might be a good description of their state in life. It seems the League of Silent Flight has hit a respondent chord in the souls of R/C soaring sportsmen throughout the world. In the first 30 days of 1972 the box score was as follows: 63 new aspirants; 20 new members; 5 new Level II members; and 2 new Level III members. This is a fairly typical mid-winter month and included 16 Australians, 1 Canadian, and 1 Belgian. The LSF seems to catch on wherever the word is spread. You can help us help R/C soaring by helping spread the word about the League of Silent Flight. Be sure to fill out the LSF aspirants form which can be found in this, or any, issue of RCM. Be sure, also, to always include return postage with your correspondence to the LSF since it is a non-profit organization that requires no dues from its members.

CLEVELAND FIRST ANNUAL R/C SAILPLANE CONTEST

The Cleveland Radio Controlaires, 21430 Morris Ave., Euclid, Ohio, will hold their first annual R/C sailplane contest at 8 A.M. on Sunday, August 20th at the club field, located one mile south of Chardon, Ohio, on State Route 44. This is an AMA sanctioned Class AA meet and will feature two events: Sailplanes and Motorsailers (powered gliders). The sailplane class will score 1 point per second of duration up to an 8 minute max with 1 point penalty for each second over 8 minutes. Launching may be by tow line, winch tow, or Hi-Start (300 meter maximum length for any launch method). A gasoline engine winch will also be available at the field.

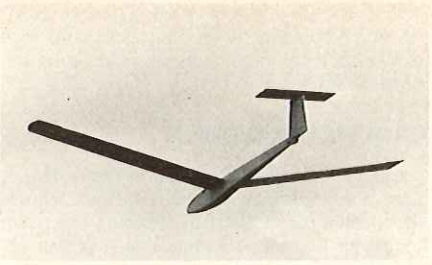
The Motorsailer class has been created to accomodate the large number of fliers who prefer to "tow" their sailplanes with power pods. To our knowledge, very few contests have been held for this type of plane due to the difficulty in equalizing engine and airplane sizes and due to the need to eliminate wild, hard-to-control climb rates. The Cleveland Radio Controlaires have developed a handicapping system based on engine displacement and wing area which they feel will provide equal competitive status. Flights will be 8 minutes max (dead stick) and scored the same as in the sailplane class. The maximum engine run will be 90 seconds with penalties imposed for over-runs. Engine size and run will be figured into the score by the following formula:

$$\frac{\text{Displacement (cu. in.)} \times 2500}{\text{Wing Area}}$$

times actual engine run in seconds. This amount to be subtracted from the flight time. In addition, a penalty of twice the time of engine run exceeding 90 seconds will be subtracted from the flight time. (This system should provide fliers plenty of room to experiment with various pet combinations). Both classes will also be scored on spot landings and trophies will be awarded through last place in both classes, a CRC tradition of some years standing. Paul Salisbury, Secretary of the Cleveland Radio Controlaires, invites each and every flyer, who can, to attend the Northeast Ohio's first R/C sailplane contest.

NEW PRODUCTS

Superior Flying Models, 4001 South 275th Place, Auburn, Washington 98002, has introduced their T_2 - - - a 75" span all-purpose R/C sailplane for two channel proportional systems. Designed by an aerodynamicist, who is also an active R/C flier, this model has been engineered for ease of building, excellent performance and durability. Features of the kit include coupled



ailerons and rudder and coupled flaps and elevator plus flying stabilizer. In other words, you get the effect of four control functions using only two servos. When ghosting along on light lift, holding a little up-elevator droops the flaps to optimum camber position. When really moving out, or for inverted flight, holding down-elevator gives negative camber effect for lower drag and more inverted lift. Coupling the ailerons to the rudder reinforces the turning power and results in instant, on-a-dime turns. The ailerons and flaps are combined in a single surface (flaperons) by the use of a simple but ingenious crank assembly. This crank includes a snap-out connection to the wing pushrods for the necessary crash proofing. The moving stabilizer includes a "Flettner tab" elevator just like the ones used on many full sized planes such as the Cherokee and Cardinal. This is not a balance tab, but a portion of the surface, that moves in the same direction as the stabilizer, doubling the available elevator power for guaranteed spin entry. According to the manufacturer, the kit requires approximately one week of assembly since most parts are cut to shape, requiring a minimum of trimming during building. The complete hardware package includes pre-bent wing rods, fully assembled flaperon crank unit, all control horns and cranks, K-links, good quality hinges, wire for pushrods, etc. All parts are shaped or machined with wood selected for suitability of grain and weight for specific application. Spruce and ply is used intelligently to hold down weight while keeping the model rugged.

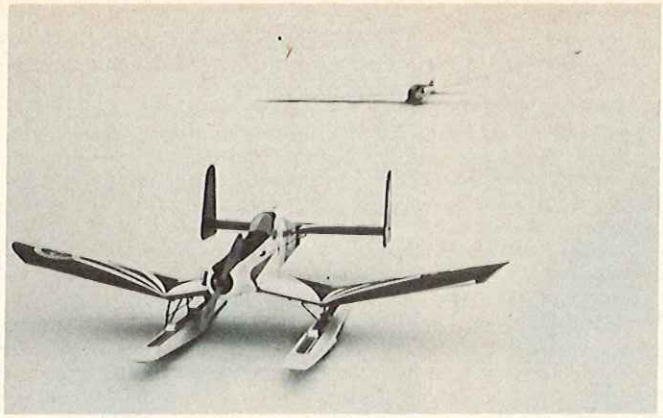
The prototype of the T_2 flies well in winds from 4 mph to over 40 mph. The design is weighted in favor of slope soaring requirements but has proved an excellent thermal machine as well. It is semi-aerobatic and can perform consecutive rolls, true spins, as well as limited inverted flight capability. Price is $28.00 from Superior Flying Models.

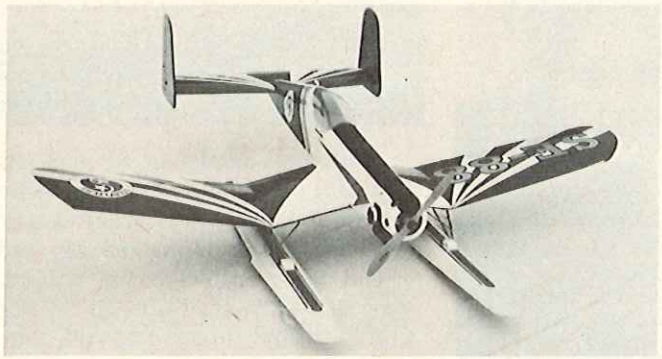
STICK-ON WEIGHTS

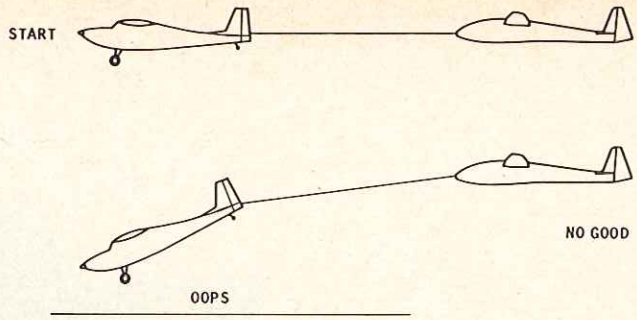
Ideal for sailplane enthusiasts are Prather Products, 1660 Ravenna Ave., Wilmington, California 90744, new Stick-On Weights that will fit into those hard-to-get areas for nose ballast. Easy to use, these Stick-On Weights will fit anywhere, as well as forming almost any contour. Priced at $1.98, the Stick-On Weight includes two 2½ oz. lead sticks per package marked in increments of ¼ oz. and ½ oz. with double stick tape on the back of the lead sticks. These have been Tested, Approved and Recommended by RCM for use in R/C sailplanes.

SOARING IN SWEDEN

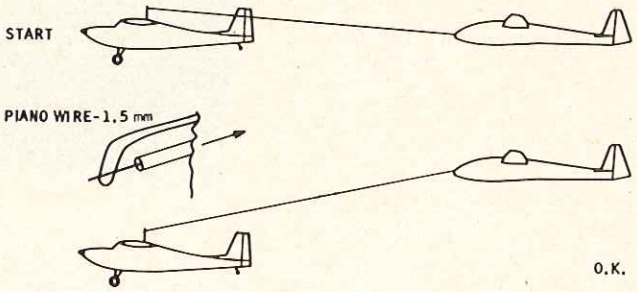
In the ever growing interest of soaring, Per-Axel Eliasson sent the following photographs and information on sailplane club







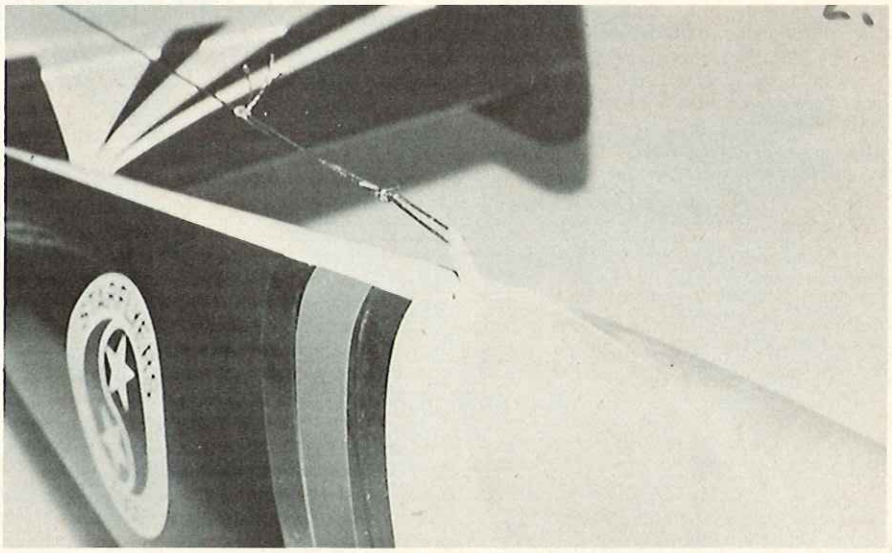
Incorrect method of power towing.

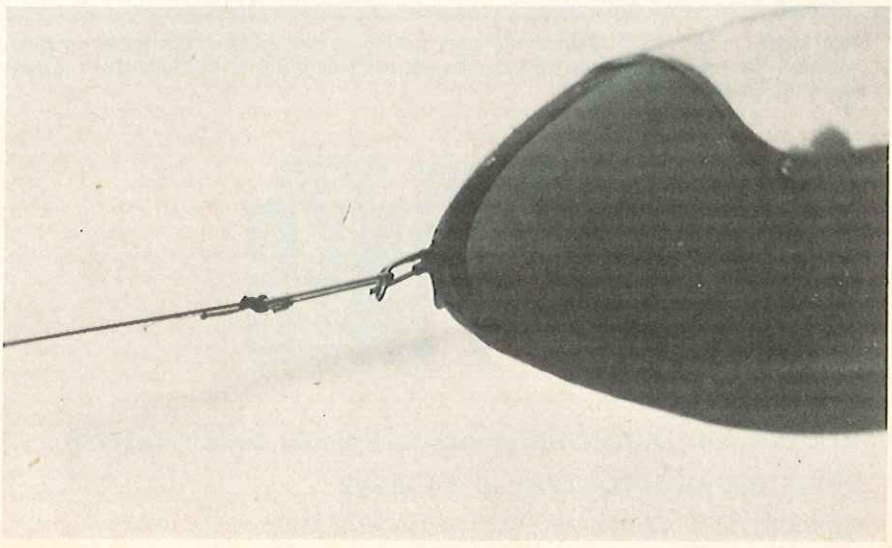


Correct power tow method.

Photos above show power ship used by Per-Axel Eliasson for towing sailplanes aloft. Close-up photos at right illustrate proper position for tow attach point on power ship and proper hook-up and release mechanism on nose of sailplane.

activities in his country. Soaring has, for some years, been a Winter activity only in the Stockholm area. In Winter, the big lakes are frozen and give many good slope soaring sites. But, with the increasing number of planes, some soaring will take place during the Summer. In his particular club, consisting of 18 active members, Per-Axel mentions that they now have some 12 sailplanes. Their experience of this past Winter has been with towing with a powered ship similar to the method used for full scale sailplanes. The key to success is the attach point of the tow line to the motor plane. As you know, full sized tow planes have the hook at the rear end which is not possible in model towing. If you try to place the tow line near the center on the top of the motor powered aircraft, it works like a charm. The release arrangement must, of course, be at the center line of the sailplane. The photographs and drawings explain the simple but foolproof release operated by separate servo or by simply giving full up-elevator. So, as Per-Axel points out, if you haven't tried it, it really is worth doing. Their experience evidences the best result with a line length of 100'. On grass, simply hold and hand release the sailplane while the motor plane makes a normal taxi start. This method is only necessary if a grass field is so rough that it causes problems with an ROG. The tow plane shown in the photographs is a German kit with modified wing dihedral to give the shortest possible legs to the floats. The latter are from an Aqua-Sonic kit and is controlled by a Skyleader radio. A Merco engine provides the power for the tow plane. □





Meet Linda . . . Miss RCM. Before you start cutting up the pages of this article to tack on your wall, see page 100 of this issue for the giant full-color poster of Linda that's meant to keep you company in the shop.

RCM GOES TO TORREY PINES

MISS RCM AND OUR INTREPID PHOTOGRAPHER, DICK TICHENOR, BRING YOU A PHOTO-STORY OF A UNIQUE ASSOCIATION AMONG SAILPLANE ENTHUSIASTS.

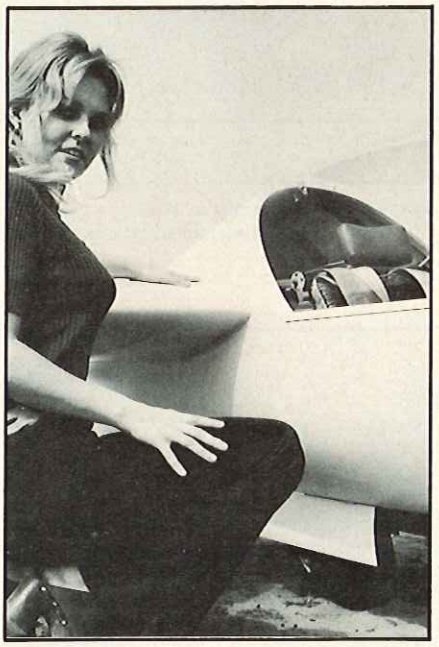
If it's any consolation, we modelers aren't the only group who occasionally run afoul of the weatherman! Coastal fog hung on all during the day and caused the cancellation and rescheduling of the Winter Nationals Soaring Championships for full scale sailplanes at Torrey Pines on February 26-27. Torrey Pines is one of the world's best slope soaring sites (January 1972 RCM cover photo) and is the home of the Associated Glider Club of Southern California. What does all of this full size glider information have to do with R/C? Co-existence is the answer!

At a time when isolated, unpleasant incidents involving R/C modeling threatens the future of model flying by governmental legislation, it is pointedly significant to recognize a compatible relationship between the AGCSC and the Torrey Pines Gulls R/C Soaring Club. As an example, stretch your imagination and visualize three or four full sized man-carrying sailplanes and seven or eight R/C sailplanes slope soaring in the same airspace at the same time! Legally, and morally, you know who has the right-of-way and the full sized sailplane pilots could easily tell the R/C flyers to find themselves another flying site.

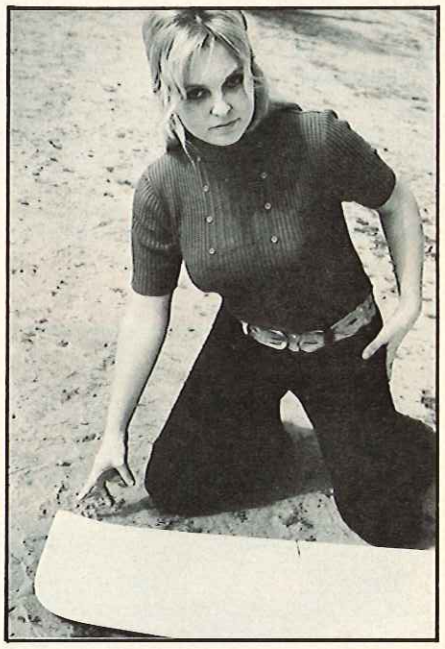
But did they? No, on the contrary, they invited the Torrey Pines Gulls to become affiliated with their association so that activities, regulations, and the like, could be coordinated and all of them can enjoy the use of this fantastic flying site. Since the Gulls are a mature and responsible group, they realize the valuable consideration extended to them and, in turn, volunteered to perform some of the unglamorous chores required in any flying contest, whether it be the full sized aircraft or our R/C models. Now you

The fantastic Caproni A-21 was on display at Torrey Pines. This unique sailplane is the subject of a special feature story in the Soaring section of the July 1972 issue of R/C Modeler Magazine. Don't miss it!

"What does THAT mean?"



"What retract gear?"



"Point to the vortex tip?"

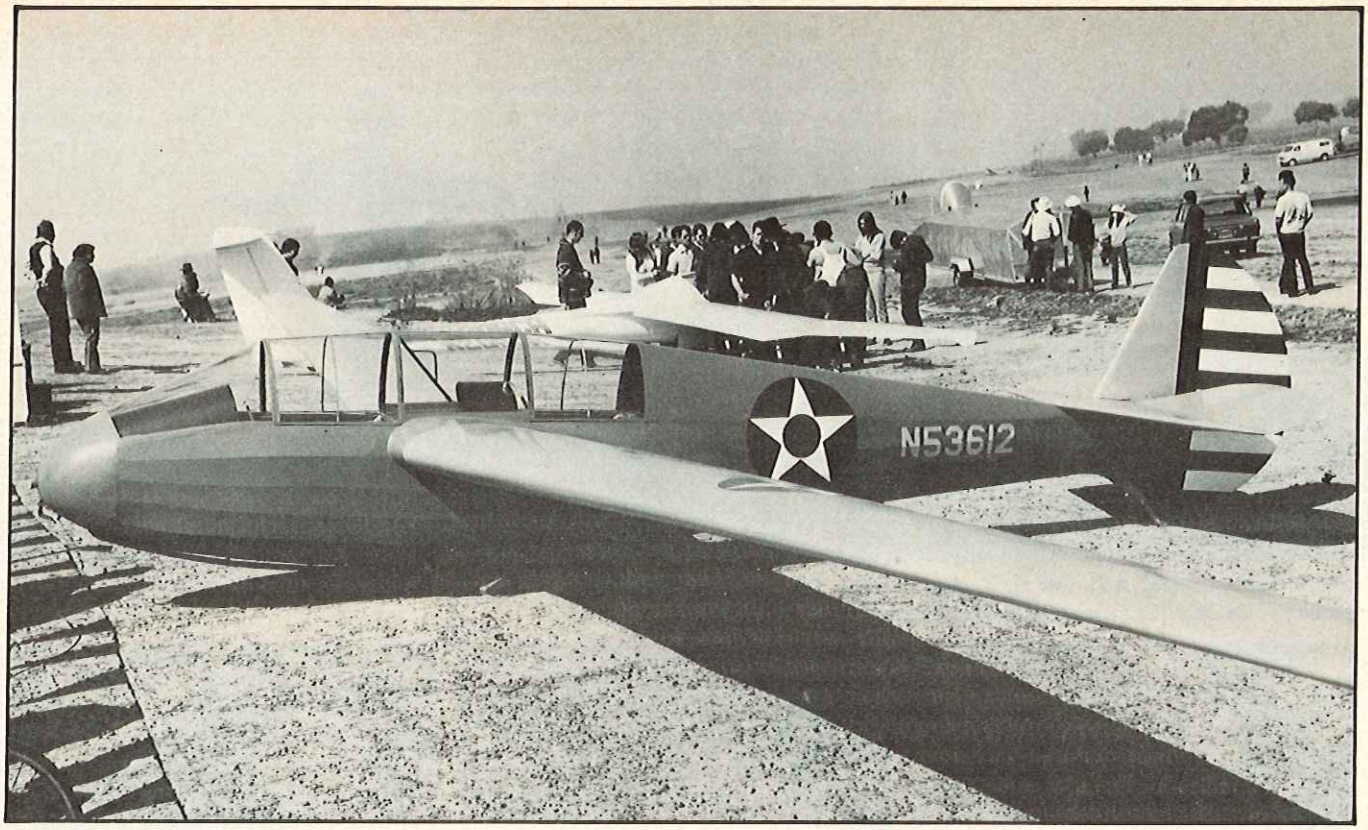
know why RCM went to Torrey Pines to see how it worked out.

The Gulls had a display area with a wide variety of sailplane types and sizes including some in construction stages. Members were on hand to answer questions and to hand out information sheets describing R/C sailplane activity. Mark Smith had his powered tow plane there (no, Clyde, the tail isn't put on upside down by mistake, it's designed to clear the tow line) and Ron Neal brought down a beautifully finished Gryphon. Visiting pilots, as well as spectators, were favorably impressed with the attractive models - - - let's face it, some of those fiberglass jobs are virtually out of sight!

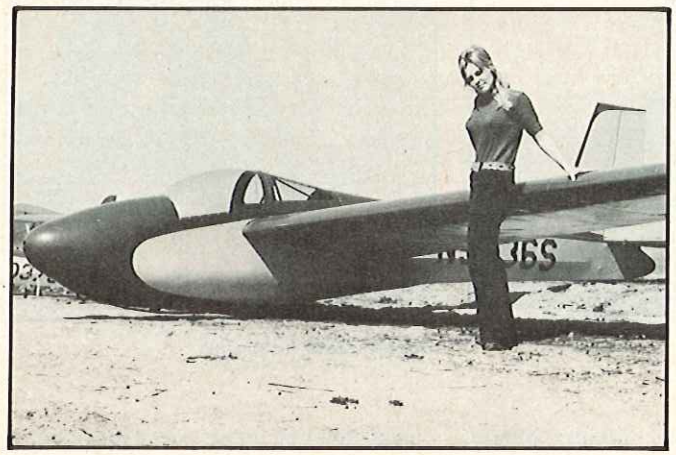
Occasionally the ocean breeze would die for a few minutes, allowing the fog to burn off, but not enough to fly the full sized sailplanes. During these breaks, the Torrey Pines Gulls flew demonstration flights using winch and Hi-Starts. Mark Smith's tow plane, with huge wing flaps, did an outstanding job of towing up some of the R/C ships. In fact, the R/C group put on a professional show and provided a welcome relief from the boredom of waiting for the full scale contest to start.

RCM took advantage of the opportunity to photograph a few of the sailplanes in response to requests from the R/C sailplane enthusiasts. Although it was disappointing that the meet did not come off as planned, it was obvious that the Torrey Pines Gulls R/C Soaring Club was there, eager to help, and did all they could to provide some interesting activities for the hundreds of spectators. In addition the SSA, the Soaring Society of America, official organization for full sized sailplanes, was on hand to provide information to the spectators as well as descriptive pamphlets on full scale soaring.

RCM tips its masthead to the Torrey Pines Gulls, the AGCSC, and to the Soaring Society of America for taking a step forward to enhance the image of R/C modeling. We hope you'll enjoy and benefit from the photographs of the full scale sailplanes.



A Laister-Kauffmann LK-10A, a two-place war surplus trainer developed in 1942 as a civilian design but produced in quantity as TG-4A's for the military. 50' span, NACA 4418, 4409 airfoil, 15:1 A/R. Approximately 50 of the 156 built are still active.

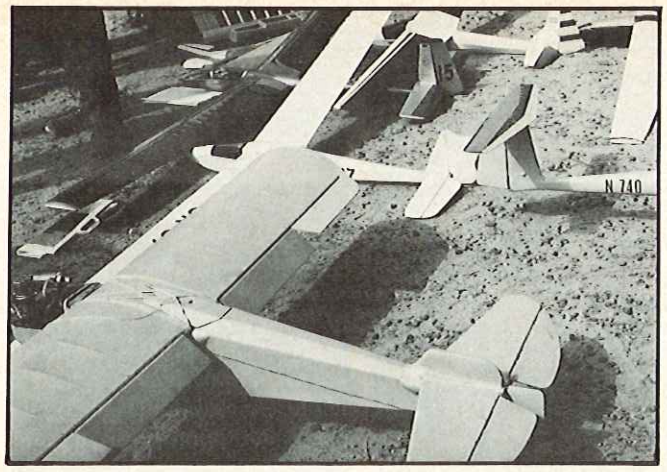


"Would I like to go for a ride?" (Schweizer 1-26D)

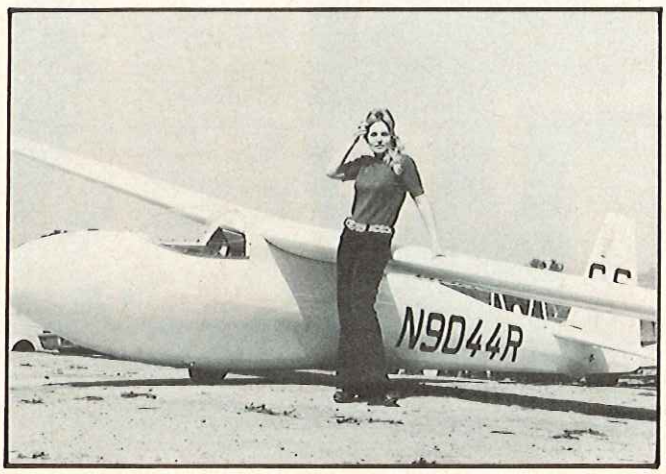
"Are you SURE they're safe?" (Schweizer -126C)

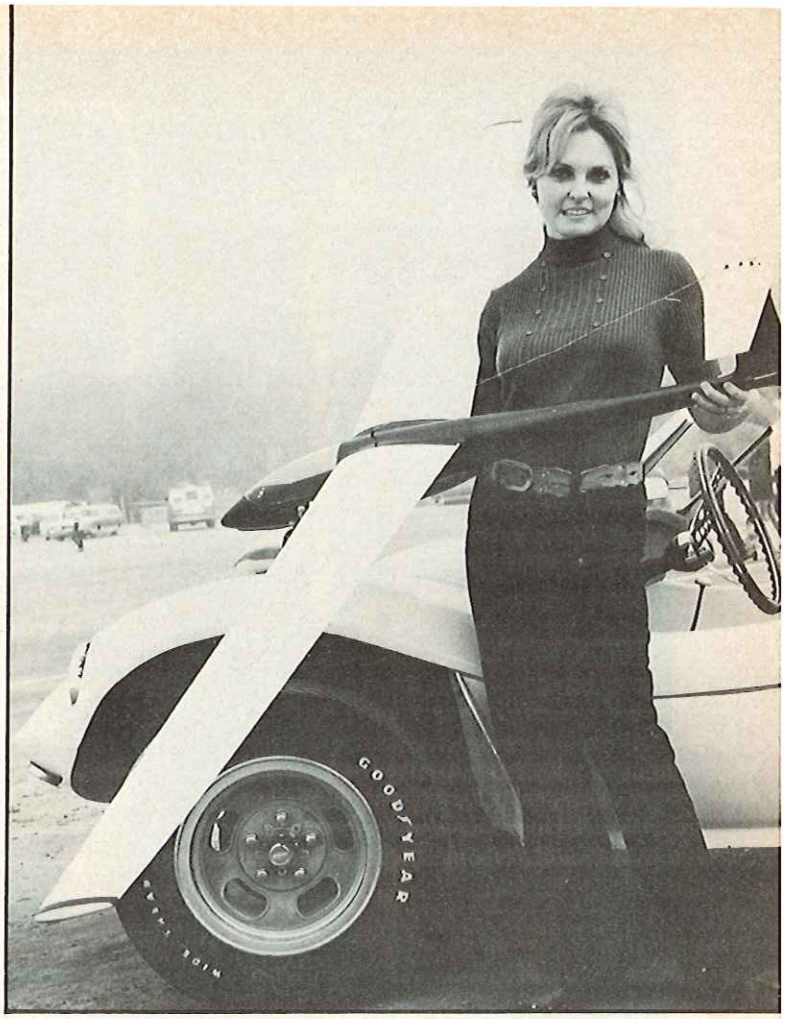
"Gee, it sure looks awfully small in there!" (Cirrus)

"Now THAT'S more like it . . . a two seater." (Schweizer 2-33)

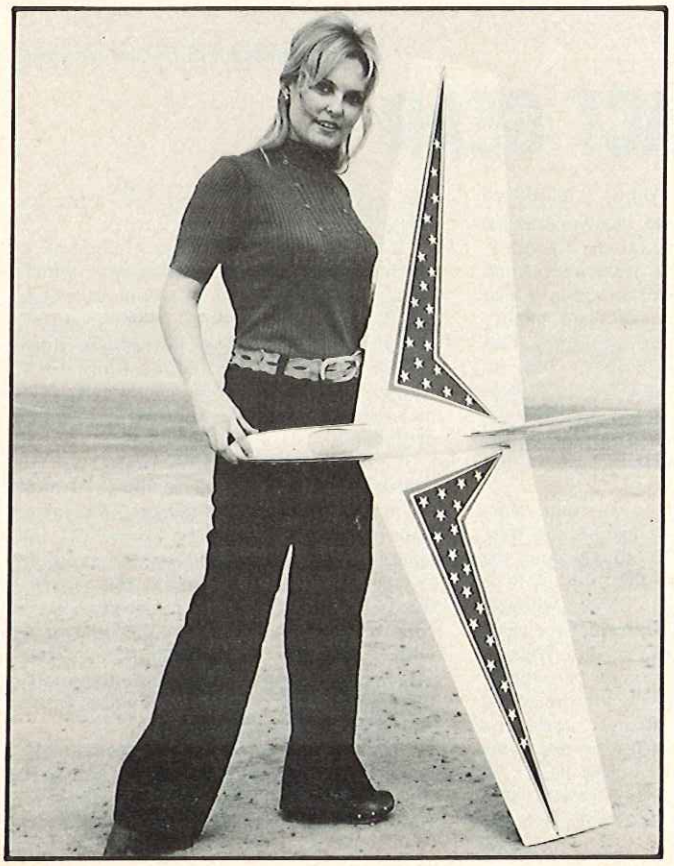


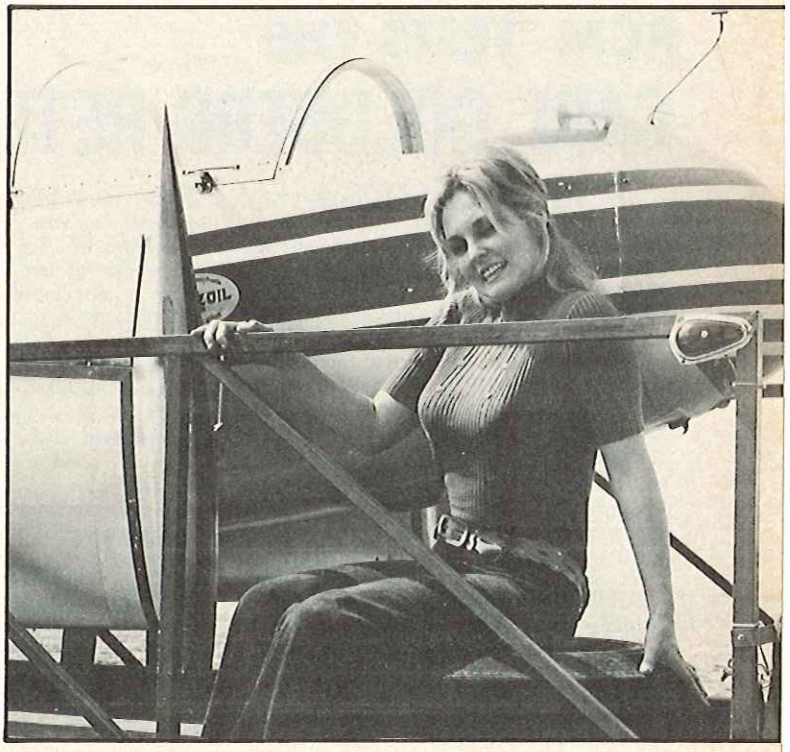
ABOVE: Corner of display area. Mark Smith's tow plane with huge flaps and "upside-down" vertical. BELOW: A Schleicher KA-6.



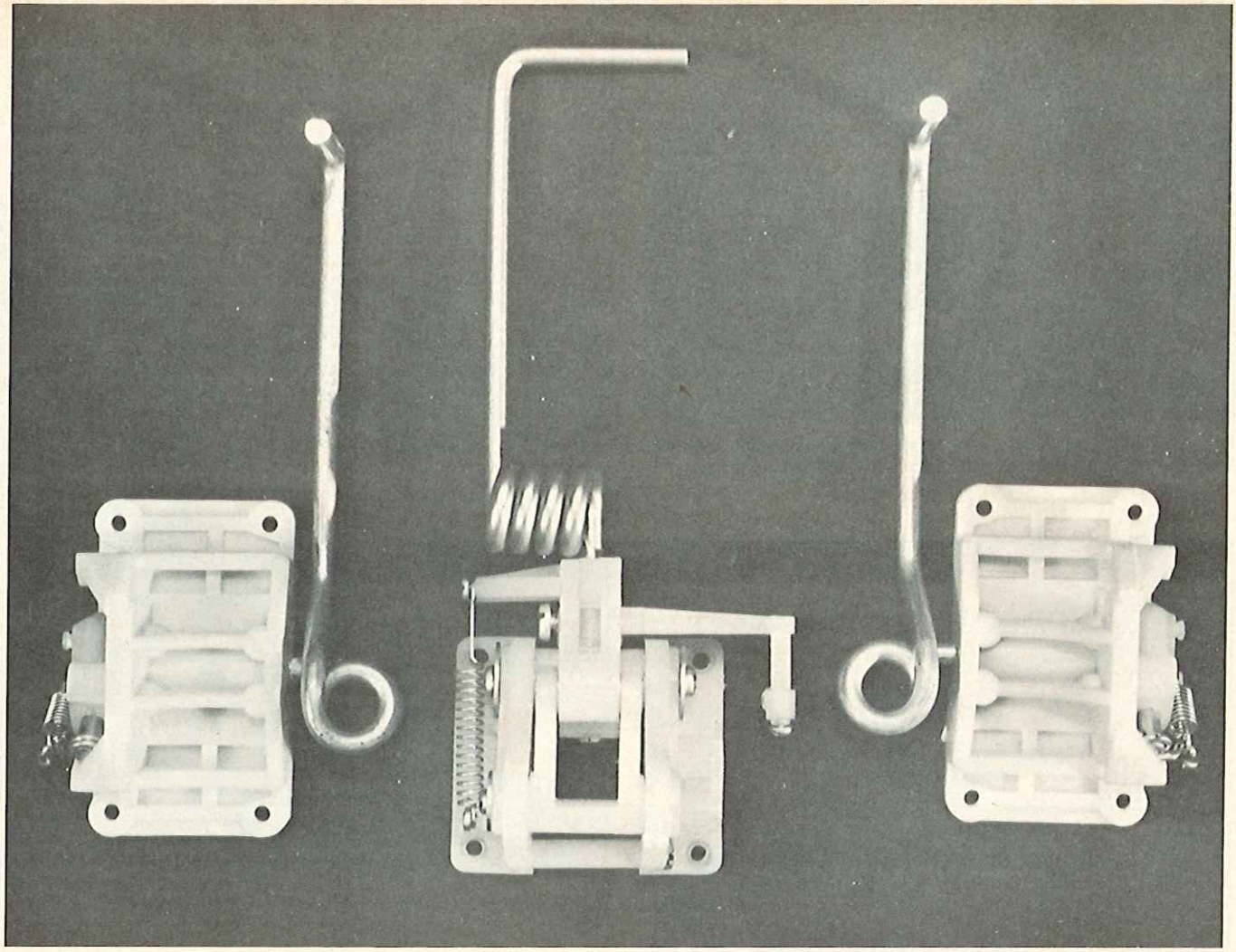


Linda poses with Torrey Pines Gulls president's Fliteglas Phoebus - - - nice!





LEFT: Miss RCM and a beautiful Gryphon from Model Dynamics. ABOVE: "So that's how you carry these things." A Blanik L-13 prior to field assembly.



The complete set of Carl Goldberg retractable landing gear.

RCM TESTS THE CARL GOLDBERG RETRACT GEAR

By Jim Simpson & Bernie Murphy

The idea of retractable landing gear is as old as airplanes themselves. All you need to do is watch ducks or geese on the wing or, perhaps, observe the eagles and the hawks soaring so gracefully, to realize that there are no ugly landing gears hanging down.

The first home-built retracts appeared more than 15 years ago on R/C models and the first commercial units soon followed. Since that time we have seen all manner of retractable units paraded before us. Unfortunately, each has apparently left something to be desired as most have not survived the ages, and the remainder have not enjoyed overwhelming popularity. Suddenly, during the last few years, there has developed a great demand for retractable gear, and now we watch the experts jump from this brand to that brand, and back again, in a frantic search for the "ultimate." Electrics, pneumatics, hydraulics, mechanical, and so forth. Which should we choose?

Take a trip to your local hobby shop and ask to see the "Goldbergs." Notice first that the gears are packaged in such a manner that you can see the entire assembly. There are no hidden complications and nothing is obscured by a century mark price tag. These retracts are identical to those wonderfully balanced, smooth, precise, well-engineered prototypes which Carl Goldberg was carrying around at last year's Nationals. Look again at the fantastic workmanship which manifests itself in the rugged and quality made fiberglass filled nylon moldings. This is true "old world craftsmanship," done by an absolute expert and, now for the biggest surprise of all - - - a price tag of only $19.95, for all three units which includes connections, rods, and accessories. It's almost too good to be true!

What's the catch, you say - - - that's only half the price of the average servo? Well, plunk down your $20.00 bill, rip open the box, and operate one of the units. A little stiff? Well turn it over, Clyde, whoever heard of rolling inverted to retract the gear? Ah - - - not balanced now, you say? Well, of course not, you've got to add the wheels. Now isn't that the smoothest and the easiest gear you've ever run? Run it again and again. Yes, all three can be run by one servo. Don't forget to thank the hobby dealer for your purchase and you might, likewise, drop Carl Goldberg a line of thanks, as well, for he can assure his people that once again they have filled a need and with a reasonable price tag, as well.

Way down in the bottom of the box is an illustrated set of instructions which contains isometric and phantom drawings, templates, measurements, nomenclatures, and all the details. These instructions show typical installations for built-up wings, foam wings, and even control line models. Also included are hookup details and adjustment procedures.

Following these instructions, we installed our retracts in a beautiful P-39 built by Dean Copeland of Omaha, Nebraska. Dean built this plane to fit Formula II and Open Pylon specifications as well as fly an excellent pattern. To actuate this system, we used Royal Products retract gear servos (one on mains and one on the nose gear) with a separate battery pack. This choice was made solely because we have the luxury of an underweight airplane and would rather haul batteries than lead ballast.

Due to the inclemate weather in the Omaha area, this system was run for hours in hobby shops and at club meetings for demonstrations before finally being re-

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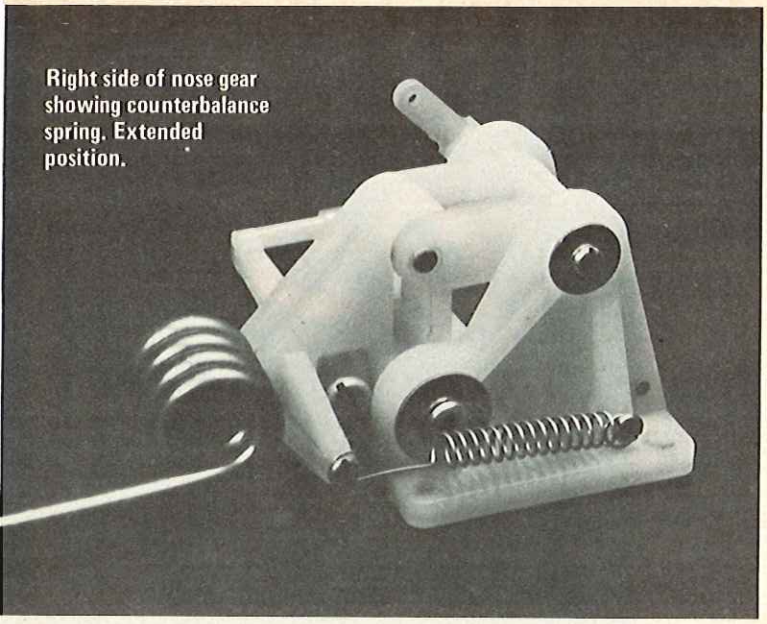
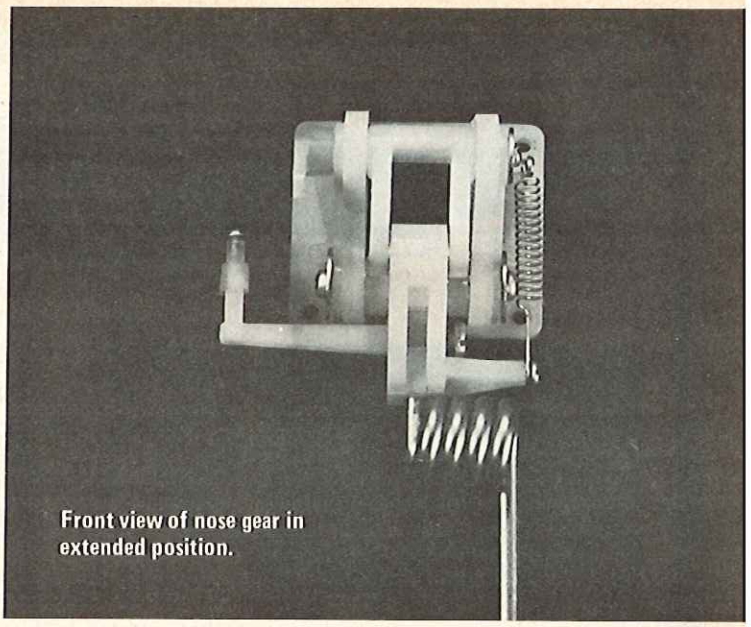
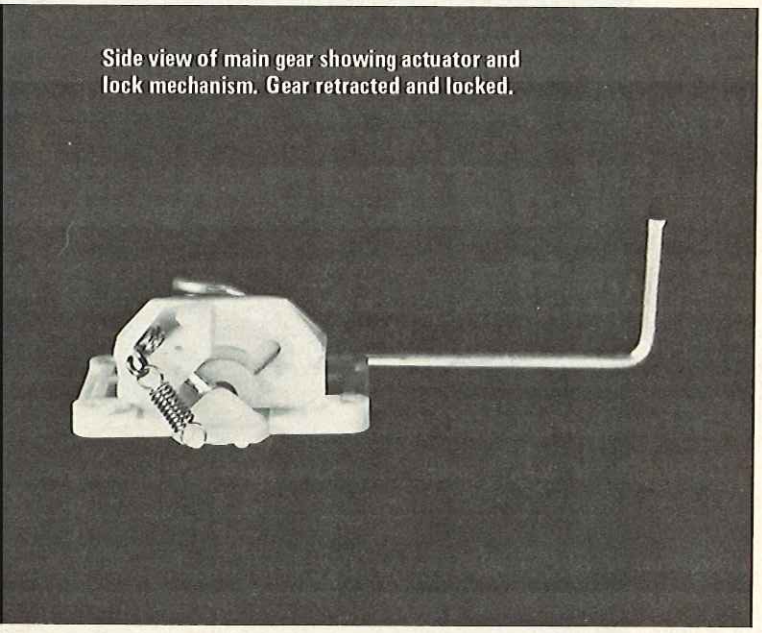


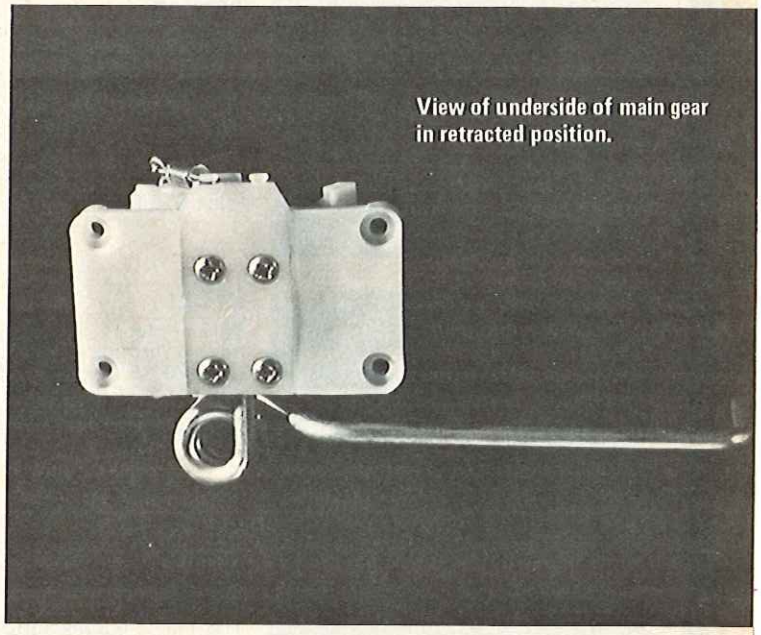
Right side of nose gear showing counterbalance spring. Extended position.



Front view of nose gear in extended position.



Side view of main gear showing actuator and lock mechanism. Gear retracted and locked.



View of underside of main gear in retracted position.

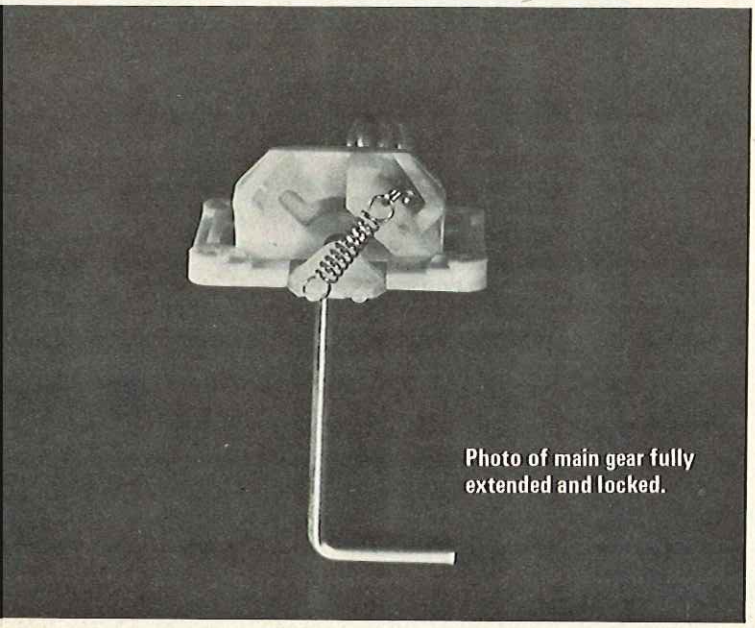
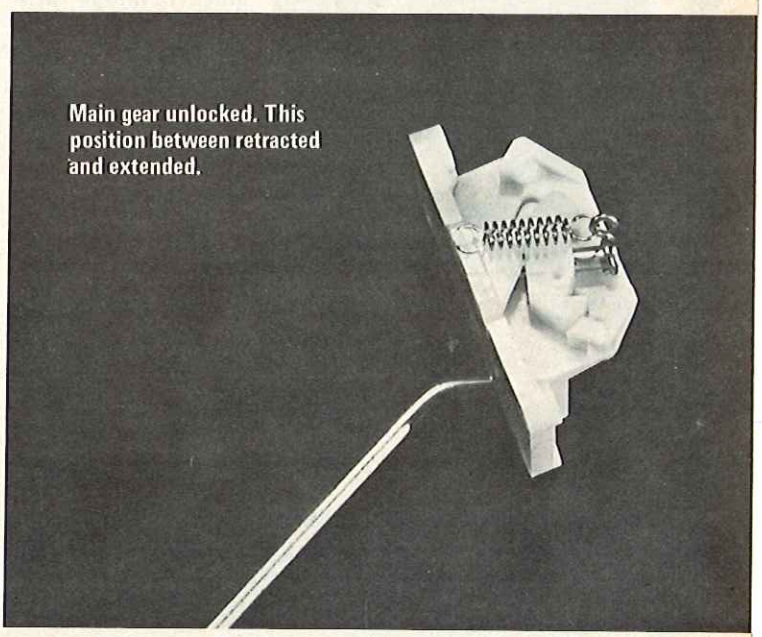
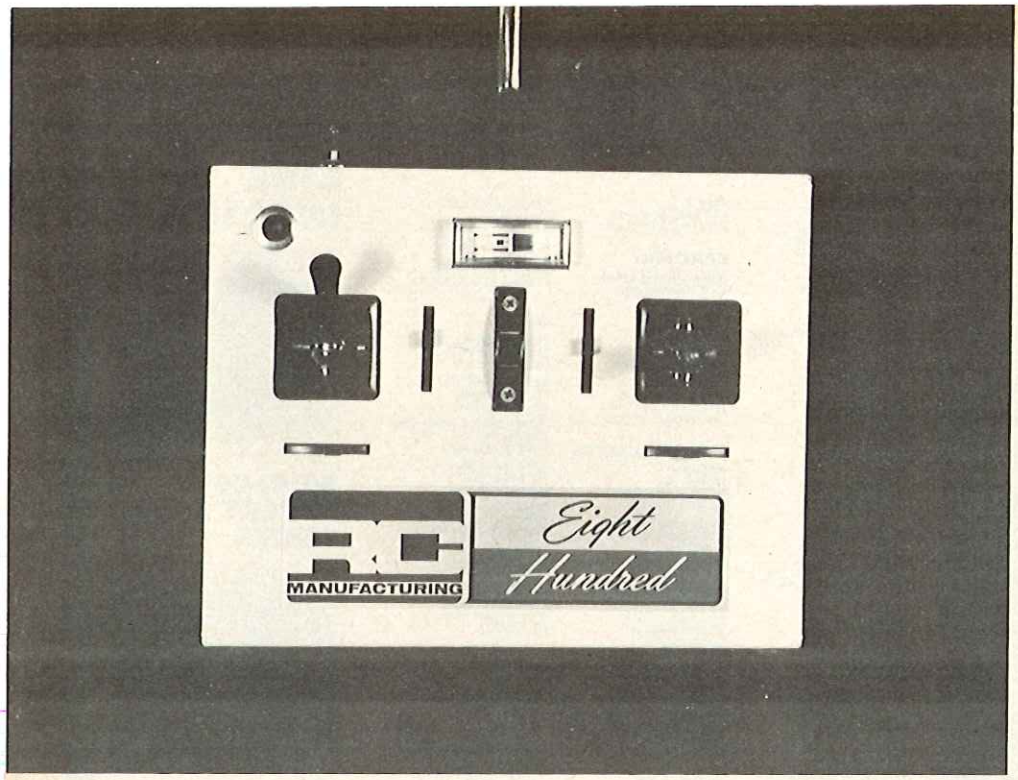


Photo of main gear fully extended and locked.



Main gear unlocked. This position between retracted and extended.



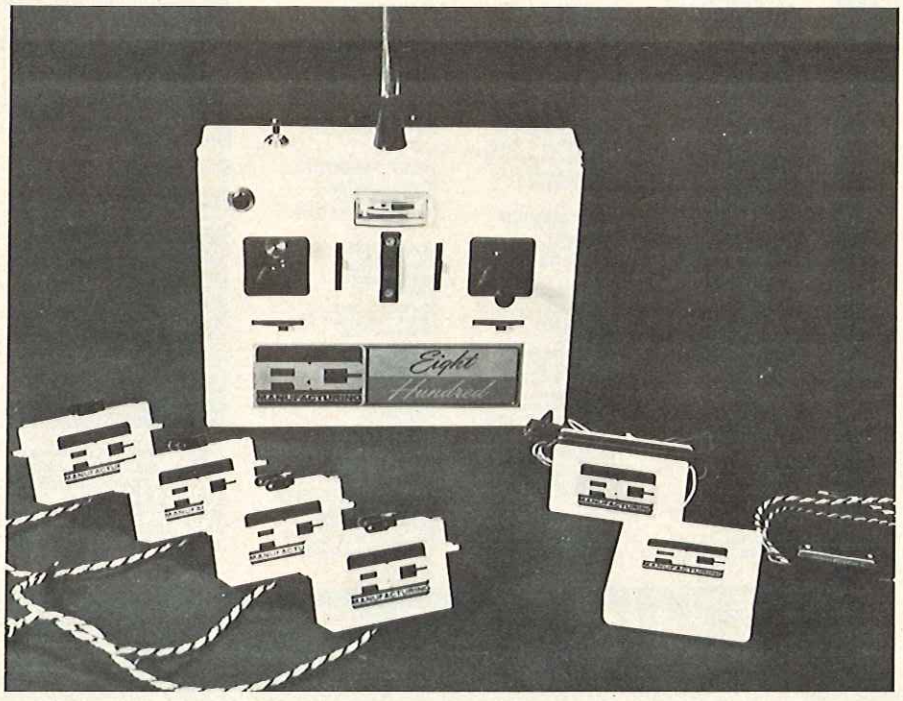
The R/C Manufacturing 800 Transmitter resplendent in off-white vinyl. It's only the beginning .

RCM PRODUCT REPORT

RC MANUFACTURING'S SERIES 800

PROPORTIONAL SYSTEM IS DESIGNED AND MANUFACTURED BY ED THOMPSON

The 800 System. Buddy box and servo service system not shown in this photo.



During the past year, R/C Modeler Magazine has tested and evaluated most of the new digital proportional systems ranging from the inexpensive two channel bricks all the way up through the higher priced digital systems. In all but one or two exceptions the proportional systems performed without any difficulties and our findings were presented to you in each report. In most cases our product reports concerning RC proportional systems sound pretty much alike - - - the manufacturers having reached a state of production where the test prototypes we have evaluated have all worked according to the manufacturers specifications for them. Some had features that others did not include, some were more expensive than others, some had better resolution, or more or less throw on the servos, etc. In virtually all of these cases, our tests and evaluations were made by extensive flight testing without going into the technical description of the system since most of them were quite similar in nature. This month, however, with the introduction of the RCManufacturing Model 8005 proportional system, designed and produced by Ed Thompson, we have a system with some unique technical features and we will go a little bit more into the technical aspects of this radio.

* * * * *

As many of you readers know Ed Thompson has been our technical editor since 1965. He has designed two complete radio control systems which have been presented as construction articles (RCM Digitrio and RCM Classic). Both of these systems were kitted and presumably thousands, including "scratchbuilts", are still flying. The Digitrio was presented at the threshold of the digital proportional era and gives evidence of Ed's pioneering efforts. Ed was flying digital proportional systems as early as 1959 while stationed with the Air Force in Germany, which were similar to todays existing systems. The Digitrio design gave Ed Thompson a chance to work directly with World Engines' digital pioneer, the late and highly regarded, Jack Port, to produce the first "full-house" digital system offered in kit form. Ed's Digitrio articles were read throughout the world on the pages of this magazine and many systems, both here and in foreign countries, bore a striking resemblance to the Digitrio for several years after the articles appeared.

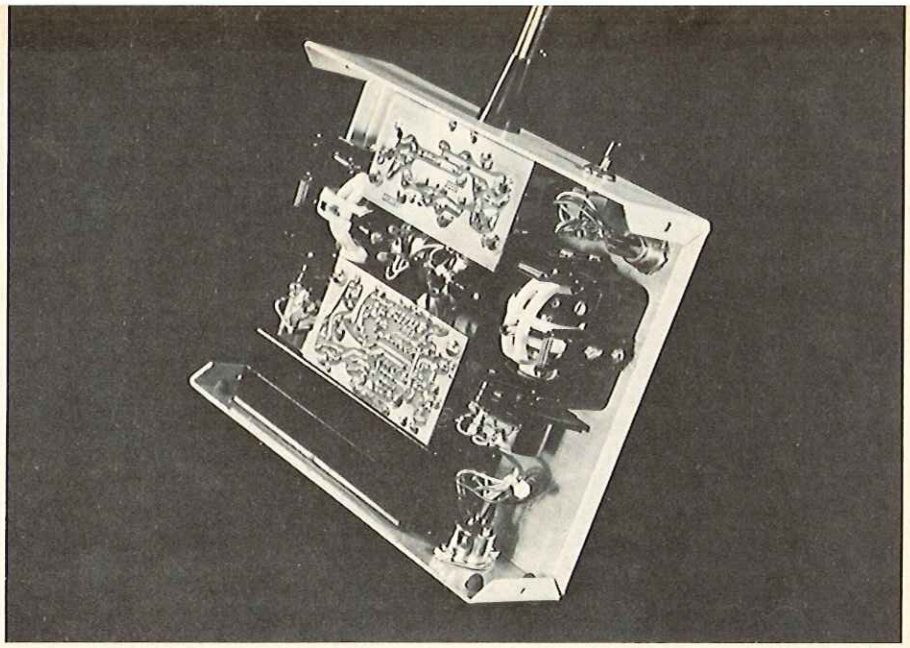
The RCM Classic proportional system was kitted by Royal Electronics and following the Classic articles came other commercial systems bearing a resemblance to Ed's design. Ed retired from the US Air Force in 1970 and was well on his way toward a new system at the time. After talking to many people in the industry he was convinced that of all the many manufacturers existing, only a few were contributing significantly to the state of the art, while others were merely copying the leaders. Since Ed has been a significant contributor to the state of the art since its inception he reasoned he would try his hand again but, this time, in a position where he could fully back his design with personal, on the spot, attention to all details. He formed a partnership with Dick Harrell and together they have worked, since Ed's retirement, at converting Ed's design into a marketable commercially produced radio control system.

Herein is our test report on RC Manu-

facturing's new Model 8005 system.

The system received for testing was RC Manufacturing's Series 800, Model 8005. It consisted of a five channel transmitter with retract switch, four Model 811 servos, four sets of rotary output adapters for the Model 811 servos, six channel receiver, transformer isolated dual battery charger, switch harness, servo extension cable, 500 ma nickel cadmium battery packs for transmitter and receiver, a hardware package containing a spare lamp for the charger and mounting hardware for the switch and charging receptacle. The system was received wired for the buddy box and "servo service" options; which included the buddy box cable, servo service cable, and mounting hardware for the "servo service" receptacle.

Top quality is apparent throughout the system. The craftsmanship is second to

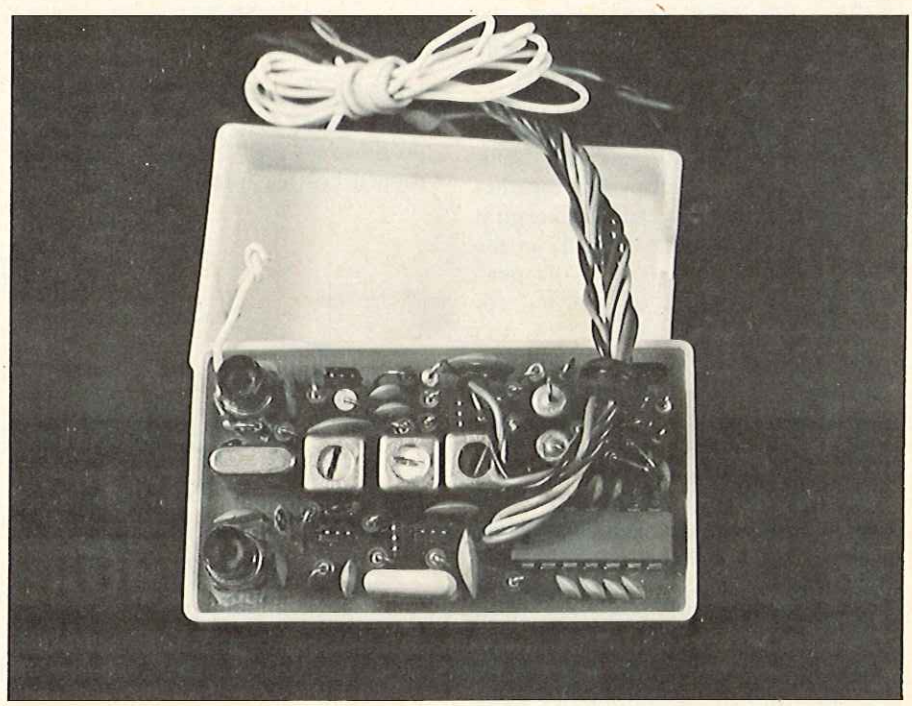


Inside the transmitter. "Closed Circuit" servo service system a most unique feature.

none. All printed circuit boards were inspected with a magnifying glass and every solder joint appeared to have been given individual attention. All components on the PC boards were installed in an orderly fashion and the assemblies did not have a "crammed look."

Nylon tie straps are used in the transmitter to hold the wires in place and nylon finishing washers are used throughout under screw heads to prevent surface damage. The transmitter case is finished with a "rich" off-white vinyl covering and the appointments, sticks, etc., are in black. The output meter is eye catching with RC Manufacturing's logo and green scale. Overall the transmitter has a solid functional look and, while extremely attractive, it also has a business like, conservative appeal.

The receiver is housed in a nylon case and appears quite modest with its attractive decal and pin stripe. Upon opening the case modesty gives way to quality appreciation similar to the feeling you get when someone



An extremely small and light receiver with a decided selectivity edge.

shows up at the flying field with a beautiful model. To start with, the nylon case is interlocking and should protect the receiver even in severe crashes with minimum damage, when installed properly. The receiver uses a solid, single 1/16" fiberglass PC board. Perhaps the most impressive thing about the receiver is the uncluttered professional look of the PC board assembly. Having observed many receiver PC assemblies in the past product reviews and building several kits, I have developed an appreciation for neatness and craftsmanship. Compared to many systems we have inspected, RC Manufacturing's receiver is a work of art. The receiver evidences engineering excellence from its military arrangement of parts to the strain relieved and ultra neat

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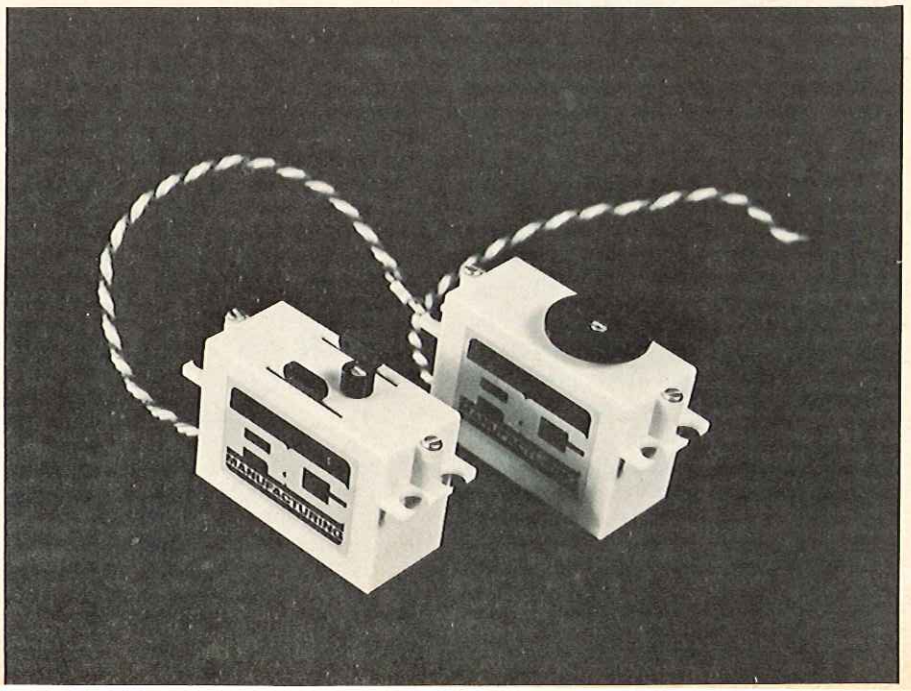
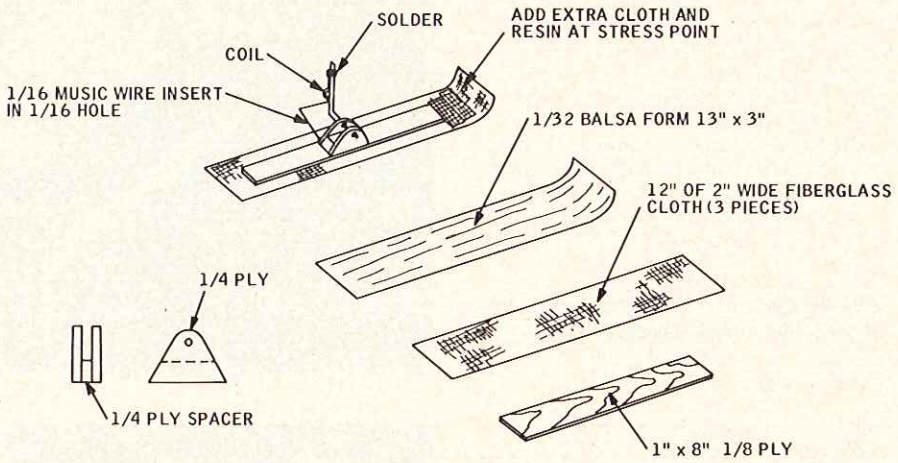


Servos use an exclusive, low-drain, IC system and both rotary and linear outputs.

FOR WHAT IT'S WORTH

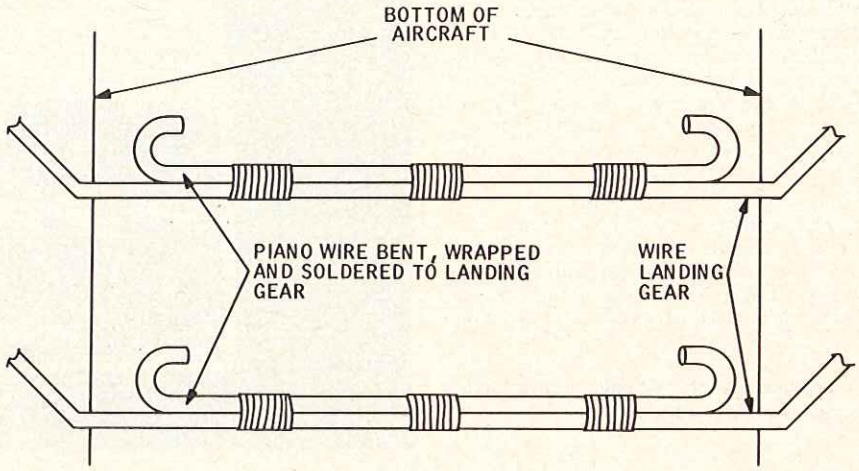
Here is a method of making fiberglass skis which are easily constructed and can be custom made to fit any aircraft. First, bend the balsa form to the desired shape and fasten down. Now, place a sheet of aluminum foil over the balsa and smooth out as much as possible. Pin it down in place. Next, mix up a batch of resin, adding color, if desired, and brush a good heavy coat onto the foil. Then put on the first layer of cloth, brush on more resin, and add the next layer, etc. You should use three layers of cloth. Before the resin cures, place the plywood on top about ¾" from the end and coat it with resin. Allow the latter to cure but, before it completely hardens, remove it from the mold and trim it up with scissors and sandpaper. Glue the ¼" plywood mount together with 5-Minute Epoxy and then resin it to the ski about 1/2 way back on the 1/8" plywood. The coil in the positioning wire should be omitted for tricycle geared craft since it is too springy to hold the skis in place on a fast model. This idea was submitted by Bob Honour, of Peterborough, Ontario, Canada.

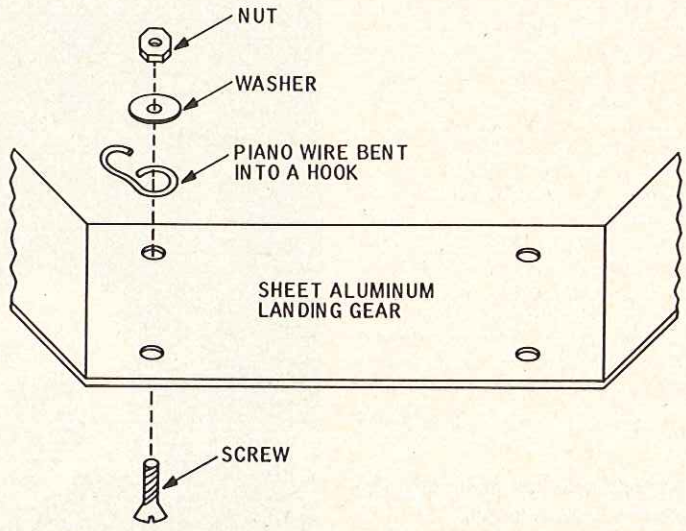


For some time now, Larry Hoffman, of Taiwan, has been using piano wire landing gear made in Japan. These are quite strong, but are difficult to keep from falling off or rotating out of position after a hard landing. The attached drawing explains Larry's cure for the problem. In addition, for those using aluminum landing gear, the drawing shows how the same principal applies. The use of four individual rubber bands gives the whole arrangement a better chance of survival.

When using epoxy to install your hinges, many times the epoxy will get inside the hinge axis and make it stiff and quite difficult to move. Mark Freifeld, of Los Angeles, California, suggests that a great way to free the epoxy from the hinge is to drop one or two drops of Liquid Wrench right on the hinge. Let it set for approximately 15-25 seconds, then blow it off. You will find that the hinge will once again move quite freely.

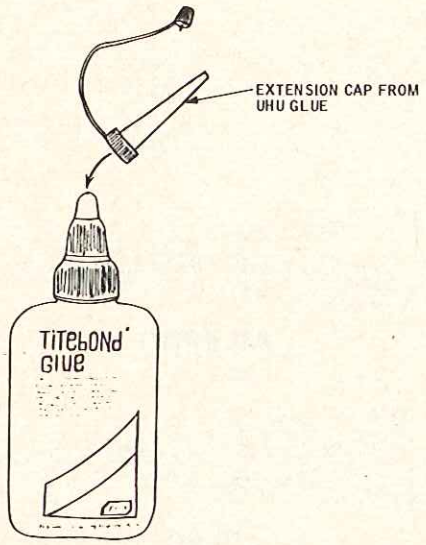
When spray painting an airplane, especially in a cold area, with Hobbypoxy paint, after letting the mixed portions set for 45 minutes, place the capped bottle containing the paint in a pan of water and bring the water to boil for about 5-10 minutes. Then immediately attach the spray cap to the bottle and spray the model. You



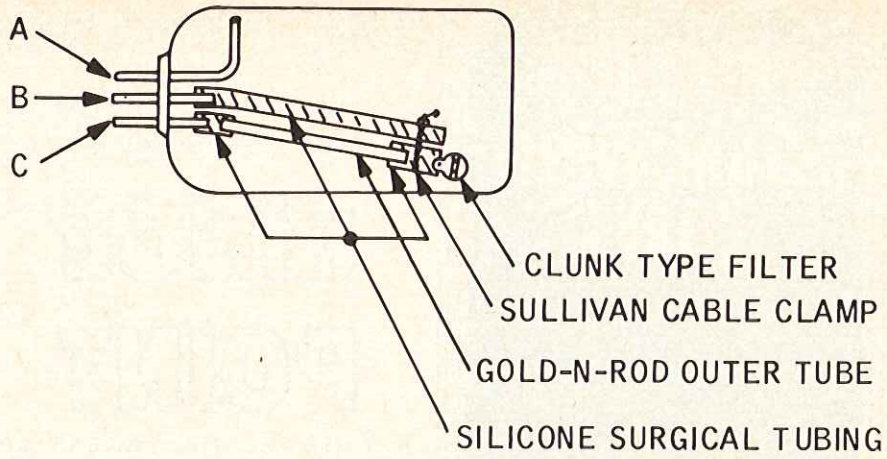


will find that the Hobbypoxy sets up dust and lint free in about 4-5 minutes. Now set or hang the model aside to cure for 24 hours before light sanding with 600 wet-or-dry sandpaper before applying the second coat. Usually, however, one coverage is sufficient. Robert Frolik, of Albany, Oregon, uses a Badger 4 oz. bottle attached to a car tire with a valve adapter and the tire pumped to about 65 lbs., and can easily spray a complete Kaos fuselage from one tire. Always have a second tire on hand just as a backup, however.

Don't throw away those plastic extension caps from UHU Hart Glue, the latter found in most German model kits. Not only is the glue excellent for bonding plastic to wood, or plastic to plastic, but the cap is the best extension that Ron McDonnell, of San Diego, California, has found to date. It fits snugly on the popular Titebond glue bottle as well as many of the other brands. When used in this manner, it becomes a most valuable extension in that you can get glue into those hard-to-get areas where it is normally impossible to reach with a normal bottle or tube. No messy syringes or glue guns to clean . . . simply leave the nozzle on the bottle and use a self-contained cap to close the bottle. Ron has been using this method for over two years and the results are excellent.



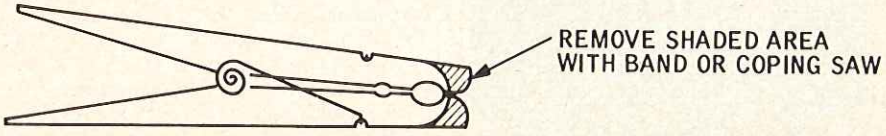
John Majikas, of Warrington, Pennsylvania, submitted this idea on the Uniflow fuel tank. This fuel tank technique was described to Jim by a fellow club member, Jim Vansant, who uses it in his U-control stunt planes. The tank hook-up scheme shown in the sketch has been successfully used by John on his Super Tigre .60 powered Dee Bee Gamma. This system gives a uniform fuel flow regardless of the fuel level, which John considers to be equal to the results obtained with a pressurized system. The following is the recommended filling and usage procedure. First, seal air tube B and open over-flow tube A. Fill through fuel feed tube C (the pump line should have a filter installed on it). When the tank is full, seal over-flow tube A, open air tube B and connect fuel feed tube C to the carburetor. The Gold-n-Rod hook-up is used to prevent the fuel feed line from going to the front of the tank whenever the rare occasion arises that you make a rough landing!



Dan Harrison, of Palmdale, California, mentions that, while finishing the woodwork in his new hangar/sewing room, he ran across a product that should be used by anyone finishing a flight box or other shop item requiring a natural wood finish. The material is called Deft and leaves a "bar top" finish and dries in 30 minutes. It is also impervious to alcohol and other chemicals. The cost is approximately $2.00 per pint and available in most hardware stores. It is easily applied with a brush and spraying is not necessary.

The merits of fast drying epoxy glues have been stated time and time again in magazine articles. However, in working with relatively large areas, such as joining wing halves, the high cost of the extremely fast drying types becomes prohibitive. $3.00 buys four times the amount of Hobbypoxy Formula II as compared with the amount of Formula IV, which you can get for $2.00. By mixing the slower drying Formula II in plastic cups and placing in a sink filled with steaming hot tap water, curing time can be shortened considerably. In addition, the heat thins out the glue, making it easier to pour into broken landing gear blocks which have only a small crack through which to apply the glue. Thinned out in this fashion, the glue is much easier to apply to foam cores in order to seal off such areas as servo compartments. Finally, pigment intended for polyester resin can be added to provide coloring when sealing off edges of MonoKote and engine compartments. It also provides a nice looking finish to wing dowels which are difficult to MonoKote. Curing time is shortened, but so is the working time, so care must be exercised to finish the job in time. If the glue begins to set up, simply place the cup back in the sink for a few minutes and it will become workable once again. This idea was submitted by Lee Goldstein, of Calabasas, California.

If you want a clamp that you will find useful in tight places, try modifying a pincher type clothespin as suggested in the sketch by Max G. Hurst, of Collinsville, Illinois. All that is required is to remove the shaded area illustrated in the sketch with a band or coping saw.



RCM TESTS THE ROBART HINGE POINT

A UNIQUE AND VERSATILE HINGE THAT VIRTUALLY ENDS CONTROL SURFACE HINGING PROBLEMS.

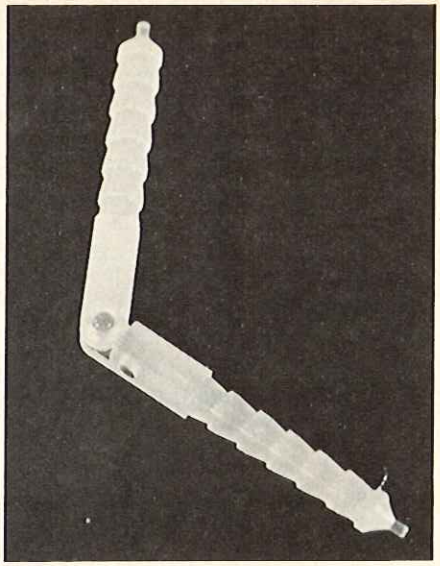
During this past month, R/C Modeler Magazine had the pleasure of testing the new Robart Hinge Point (Patent Pending), the newest hinge offered to the R/C modeler.

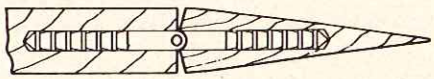
Unlike the current hinges on the market, the Robart Hinge Point has several unique features which make it the most versatile and unusual hinge yet offered for model aircraft construction. First of all, the hinge is one of the easiest to install if you are using 3/16" thick, or larger, control surfaces. All that is required is to drill a 1/8" hole in the surfaces to be hinged and insert the Robart Hinge Point with either Titebond or epoxy. The barbs on the hinge, plus glue, make a super bond even in foam wings, and the hinge has proven to be virtually pull-out proof. Due to the unique hinging action of the Robart Hinge Point, the simple installation assures permanent and perfect alignment even if the holes you drill are not perfectly aligned. In addition, the Robart Hinge Point has a fast and easy "take down," or disassembly, of the control surfaces since all that is required is to slip a screwdriver between the hinge sections and unsnap. Yet, the Robart Hinge Point cannot come apart any other way.

This new hinge is molded from super strong glass filled nylon and is ideal, as the illustrations show, for hinging sheet control surfaces, plastic "ARF's", where one surface is foam and the other is sheet wood; scale built-up control surfaces; aileron or flap hinging; or flap hinging with an external hinge point.

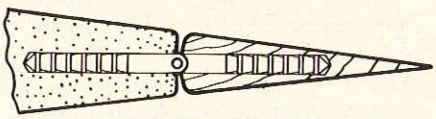
We have used the Robart Hinge Point, manufactured by the Robart Manufacturing Company, P.O. Box 122, Wheaton, Illinois 60187, and have found that it is the finest hinge we have used to date, providing a hinge that is as flexible as the old "sewn thread" hinges, yet offering an ease of installation that requires no pinning or surface drilling with a durability that is hard to believe until you try it. In addition, the built-in feature of being able to disconnect the hinges for the initial painting of the model, or for periodic maintenance, is truly outstanding. The Robart Hinge Point is priced at six hinges for 95 cents or 15 for $1.95. They are well worth it.

The Robart Hinge Point has been Tested, and is Approved and Recommended by R/C Modeler Magazine. □

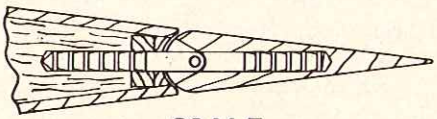




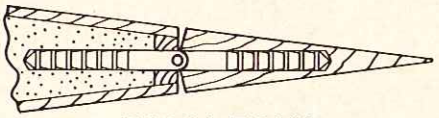
SLAB



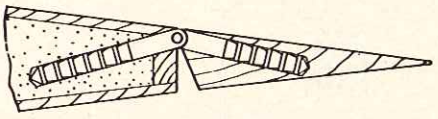
PLASTIC "ARF"



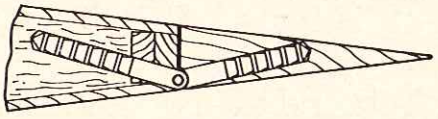
SCALE BUILT UP



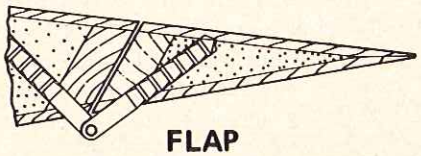
BALSA FOAM



AILERON



FLAP



FLAP EXTERNAL HINGE POINT

CONVERTING TO FLAPERONS

BY BEN STRASSER

Under most weather and landing field conditions, it would be nice to be able to significantly slow down the landing speed of your plane as well as cut down on the stretch of runway it needs to get up there in the first place. Flaps will do it. They'll also help out with some maneuvers or stunts, as well.

For the plane that's already built and flying, the job of coverting to flaps can lead to a king-sized rebuilding job. But, if you're using strip ailerons on your ship, it will only take a couple of pieces of plywood, a hardwood rail, 10" or so of 1/16" piano wire, about three inches of the inside of a piece of Gold-N-Rod, some quick drying epoxy, a miniature horn, a fifth servo, and a minimum of your time.

The job is to rig your strip ailerons so they'll work normally as ailerons, and, so that they can both be lowered – at the same time and to the same degree, on command from your transmitter – so they'll function as flaps. So, your present strip ailerons will then work both as flaps and as ailerons.

FLAPERONS!

You can experiment with the idea – to observe the effect – without doing any re-work on your plane. First, fly your plane one time out as usual. Get the plane in level flight and throttle back to half rpm. Watch what happens. Does the plane hold level flight, or does it sink or climb? Then, when you're down, pull the wing. Unhook the clevises which connect the servo to the aileron arms. Unscrew both clevises 1 to 2 full turns. This should lower the neutral position of both of the strip ailerons. Re-snap the clevises onto the aileron arms, replug the aileron servo, put the wing back in place, and take it up again. Get the plane flying straight and level again as you did before and, once again, go to half throttle. You should be able to notice the increased lift of the plane. Now, watch how it comes in on your final approach.

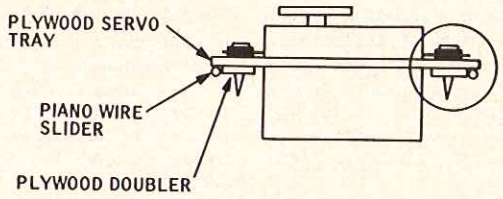
If you see no difference at all, you may want to unscrew both of the aileron arm clevises another turn or so. Don't get carried away, though, and unscrew the clevises too many turns. Experiment a little at a time and your chances of getting into a heap somewhere out on the field will be significantly reduced.

That's the idea behind the flaperons. Now the question is how to create that effect from the ground so you can get the flap effect when you want it and zero them out when you want the speed.

THE SET-UP

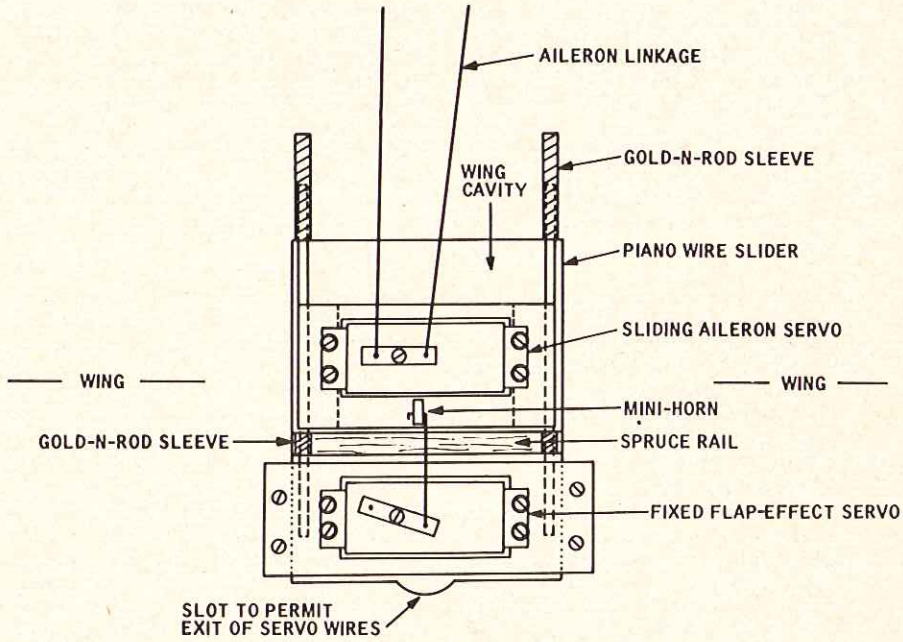
One way to accomplish this is to rig your strip ailerons as usual – but mount the aileron servo on a tray that is built to slide back and forth. A second servo, the flap-effect servo, is rigged to move the aileron servo from the neutral point – with no flap effect – toward the rear of the wing for down flaps.

The heart of this rig is the rack on which



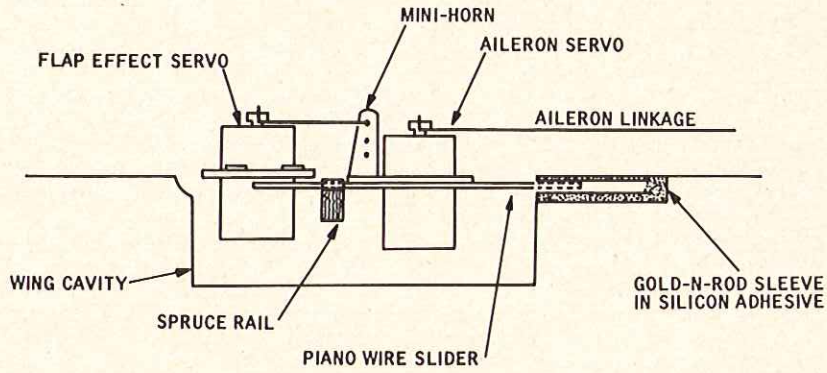
SLIDING AILERON SERVO TRAY
END VIEW

DIAGRAM #1



FLAPERONS SET-UP
TOP VIEW

DIAGRAM #2



FLAPERONS SET-UP
SIDE VIEW

DIAGRAM #3

the aileron servo is mounted. It has to be such that there is no up/down or side-to-side slop that may cause binding, or that may add to the vibrations normally experienced by the servos, or, that may make for sloppy aileron or flap control. In addition, the rack has to permit backward/forward movement with a minimum of drag.

The "sliders" for the aileron servo tray are made by epoxying a piece of piano wire to the right and left sides of the aileron servo tray. A piece of inner Gold-N-Rod tubing is placed on each piece of piano wire that extends from the front and back of the aileron servo tray. After the outside surface of the Gold-N-Rod sleeves are roughened a bit, they are epoxied to a hardwood rail in the front and back. A mini-horn is added to the leading edge of the aileron servo tray and a short piece of piano wire linkage connects the sliding tray to the flap-effect servo. And, that's it.

The words and diagrams that follow should be helpful to anyone who wants to go the flaperon route. Flaps down, open the throttle, and up it goes.

BUILDING NOTES:

The diagrams provided are not drawn to scale. Specific dimensions of the trays, lengths of 1/16" piano wire, Gold-N-Rod, etc., will all have to be adapted to your particular set-up. Both of the servos are mounted sideways to minimize the size of the wing cavity. This also makes it possible to connect the linkage from the flap-effect servo to the center of the sliding aileron servo tray to maximize a drag-free operation. The holes cut into the servo mounting trays should allow clearance all around the servo.

Measure the amount of movement you'll get out of your flap-effect servo so you'll know exactly how much room you'll need for the sliding aileron servo tray. The wing cavity should be deep enough so the servo wires (which pass under the servos) won't get pinched under the servos.

BUILDING THE SLIDING AILERON SERVO TRAY

The sliding aileron servo tray should be just slightly more narrow than the width of the wing cavity. The sides of the tray should be parallel. The sides serve as guides when the piano wire sliders are epoxied in place – to assure that the sliders are parallel.

The plywood doublers (Ref. Diagram No. 1) are added to the bottom side of the servo tray just the width of the piano wire sliders in from the edge. The doublers serve two purposes. First, they add to the thickness of the wood for the servo mounting screws. Second, they provide another surface to which the piano wire sliders are epoxied, which assures a better bond to the servo tray.

Two pieces of piano wire cut to the length of the wing cavity are to be epoxied to the bottom side of the sliding aileron tray. Roughen the center section of the piano wire where it will be epoxied to the tray so the epoxy will form a better bond to the wire.

BUILDING THE FLAP-EFFECT SERVO TRAY

A heavier piece of plywood was used for the flap-effect servo tray so no doublers were necessary. Two hardwood inserts were epoxied into the wing for the flap-effect servo tray hold down screws. During actual construction, we modified the size of this tray so it would overlap the spruce rail. (Ref. Diagram No. 2) In this way the flap-effect servo tray overlapped the Gold-N-Rod sleeves epoxied to the spruce rail to assure they wouldn't pull off under any stress conditions. Make certain that the servo mounting screws will not interfere with the back and forth movement of the piano wire sliders.

INSTALLING THE SERVO TRAYS

The piano wire sliders should be trimmed so that when the sliding aileron servo tray is held in the center of the entire wing cavity (without the flap-effect servo tray in place), the sliders should be about 1/8" short of either end of the cavity. (They may be trimmed further later.)

Hold the servo tray so that it is just level with the surface of the wing. Push the tray to the rear so the piano wire sliders mark the rear of the cavity. Then you'll know where to make the holes to receive the Gold-N-Rod sleeves. (Note that the Gold-N-Rod sleeves are made from the inside – moving piece – of Gold-N-Rod).

Because our test ship has a foam wing (the following may be adapted for a balsa wing), we found a nail that was larger in diameter than the size of the Gold-N-Rod sleeve. It was heated slightly with a torch and then pushed about 1½" into the back of the wing cavity where the piano wire sliders had made their mark earlier. Then we plugged the back end of both pieces of 1" sleeve with mini-spitballs, filled the nail holes with GE Silicon Sealent/Adhesive, and put the sleeves onto the rear (trailing edge end) piano wire sliders. We also rubbed a bit of silicon adhesive onto the outside of the sleeves as well.

When all was ready we lowered the sliding aileron tray into the wing cavity and simply pushed the sleeves and all back into the over-sized, silicon filled holes. The excess silicon adhesive was wiped away.

After the tray was lined-up even with the wing surface, and with the sleeves pushed back into the holes, we laid a piece of masking tape over the top of the wing, over the wing cavity, and over the top of the sliding servo tray to hold the tray in place as the silicon dried. The next day the rear sleeves were firmly fixed in place and the piano wire sliders slid in and out with ease. We then measured and cut a spruce rail on which the front sleeves were to be mounted.

Some epoxy (5 minute variety) was placed on the ends of the spruce rail and on the appropriate mounting spots on the walls of the cavity. (Ref. Daigrams 2 & 3). We put the rail in the approximate location, (which allowed for more than ½" movement of the sliding servo tray) and two pieces of Gold-N-Rod sleeves, cut to the width of the spruce rail, were slid onto the two front piano wire sliders. Final adjustments were made so that when the sleeves rested on the rail, the former were just even with the top of the wing cavity. (Note that the sleeves are not yet epoxied in place.) Then, the epoxy was left to set-up.

Finally, we roughened the sleeves which were to be epoxied to the rails, slid them onto the front piano wire sliders, and epoxied them in place. Be careful not to get any epoxy on the piano wire sliders. Before the epoxy sets up, test the front-to-back movement of the sliding aileron servo tray and make any necessary last minute adjustments. When they are lined up to permit the free movement of the aileron tray, let them

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GOLDBERG RETRACTS

from page 54

warded with a decent day to fly. The test hop was flown with a 32°F temperature, off of a rough sod field (by no means suitable for retract operation), in an airplane which is 700 kinds of fast. The P-39 weighs exactly 5 lbs., and uses a K & B racing .40 for power. I shuddered as I watched the gear absorb the grass clump impacts on the takeoff roll. After it broke ground, I retracted the gear and flew the first of many exciting flights with the "clean look." Landings are a thing to behold, as well. Remember, this is a very fast plane, and the resulting fast landings on sod runways really excercised the shock coils.

It is our pleasure to report that, to date, we have experienced absolutely no malfunction whatsoever. Since the first production run, Carl Goldberg has incorporated, and will continue to refine, changes as they come up. The Carl Goldberg retractable landing gear are simple, containing only four basic parts to the main gear plus spring and hook. They are small - - - the main gear is only 1" high and will fit in even the thinnest wings. They feature a simple, positive locking in both the extended and retracted position. As for weight, the entire three gear system weighs only 5 ounces. This is undoubtedly one of the best all around retract systems currently available. The cost of $19.95 is unusually low for a product of this quality. The gears have proven to be relatively maintenance free, even when used on rough grass fields. Only a small amount of pressure is required to operate the gears, and all three can be easily operated from a single servo, although we prefer to use two servos to simplify the linkages.

In the first paragraph of the Goldberg retractable gear instructions, Carl points out that no one has all the answers - - - then asks for your comments, suggestions, and findings. Therefore, it is with complete sincerity, that we at RCM find the Carl Goldberg retracts to be of dependable quality at a reasonable price. We have thoroughly Tested, and Approve and Recommend this retractable gear system from Carl Goldberg Models, Inc., 2549 West Cermak Rd., Chicago, Illinois 60608. □

R/C MFG'S SERIES 800

from page 59

attachment of output wire cable. We showed this receiver to several of our technical friends and they were all highly and favorably impressed with the engineering, layout and construction. The fact that the receiver has an eight channel decoder was almost forgotten due to the receiver's overall look of functional simplicity.

The servos used Kraft KPS-11 mechanics, one of our favorites, with RC Manufacturing's IC amplifier providing the muscle. The PC board is held in place with two screws with fiber washers under their heads. The servo wiring is very neat and allows full access to the PC board assembly simply by removing the mounting screws. The servo amplifier is built on one PC board and as usual evidenced excellent craftsmanship.

The battery charger is housed in a bakelite case with a beige vinyl, aluminum cover. It has two indicator lamps, one for the receiver and one for the transmitter. The lamps are housed in panel mounted lamp sockets and are, therefore, replaceable without disassembling the charger. The line cord enters the box through a strain relief grommet and the box cover is protected from the mounting screw heads with nylon washers. The charger is wired to the same high standards as the rest of the equipment.

TRANSMITTER

The transmitter uses "pulse off" modulation. The frame rate is fixed at 20 milliseconds and each channel is variable, from 1-2 milliseconds in width.

The encoder is contained on its own PC board and utilizes an eight channel integrated circuit as the pulse width generator. A free running multivibrator is used to "clock" the encoder and a one shot multivibrator is used for modulation pulses. Another integrated circuit is used as an exceptionally stable voltage regulator. It's hard to imagine that the small size of the PC board could house eight channels, but it does so with ease and all components are well spaced. RC Manufacturing has "coined" a new term to describe their encoder; they call it a "shift shot," since it is an innovation departing from the usual half-shot circuitry. All channels of the encoder share a single timing circuit instead of the usual use of a separate timing stage per channel. I believe Bonner used a similar circuit with a double pulse system, but to my knowledge RC Manufacturing is the first one to use it with adjacent pulse operation. In any case, the circuitry reflects a great degree of original technical expertise. The pulse widths are uncommonly uniform in throw and the "set up" time for adjusting each channel is reduced to a simple operation during manufacture. The integrated circuit used for voltage regulation has extremely good regulation and its high quality is seldom, if ever, found in model radio control systems. We were unable to measure any pulse width drift at all from full battery voltage after charge to well below the normal discharged voltage. The system R/C Modeler tested was wired for five channels with a retract switch. Since the full eight channels are wired minus pots or switches for the remaining three channels, only they (pots or switches) must be added for additional channel operation.

Moving on to the RF assembly, we found another well-designed and constructed PC board. We might add here that access to all PC boards is quite easy as they are both mounted to the stick assemblies with two screws each and can be lifted out for inspection. The RF assembly has the modulator transistor mounted on it along with an oscillator and power amplifier. Tuning is simple with a single slug tuned coil for each function. (Of course you must have a FCC license to make adjustments to the transmitter); The relative simplicity of the RF board gave rise to speculation that average output power was to be expected. However, comparative field strength measurements indicated that it was above average and it equalled or outdid several systems advertised as high power types. The more than adequate output power was verified later by flying the system without incident with the transmitter antenna half collapsed. Even with the transmitter antenna fully collapsed

we were able to fly a reasonable pattern, but we don't recommend you try it – especially on 27 MHz!

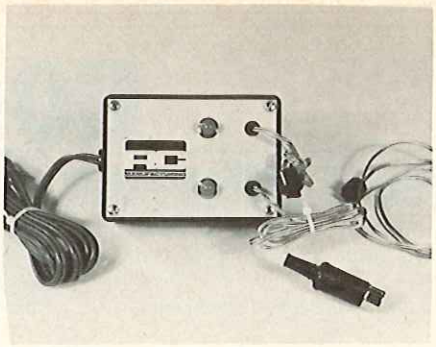
Special attention has been given to output transistor heating which is problematic with some transmitters. The transmitter was operated extensively without the antenna and no significant heat rise was detected attesting to the thoroughness of the design. Tuning test showed the transmitter to be unconditionally stable regardless of tuning slug position or RF load condition normally encountered.

The transmitter has some individually unique features. To start with, the "buddy box" system is so ingenious we had to hold up this report to obtain another transmitter to verify its operation. Buddy box operation was described as practically foolproof by RC Manufacturing. First of all, when flying normally the buddy box button can be depressed without losing or impairing control. Secondly, if you are flying with the buddy box and the trainee depresses his button, no impairment occurs. Third, there is no master slave switch to complicate matters. The buddy box cord has a black plug on one end and a grey plug on the other. The black plug is inserted in the transmitter to be used by the trainee and the grey one is inserted in the trainer's transmitter. That's all there is to it.

The "servo service" feature is one of the most original features we have seen in a long time. With it you can operate the system in a "closed circuit" manner. This means that you can go to the flying field and, while others are flying on your frequency, operate your system via "closed circuit" to check control surface trim, motor adjustments, etc., without endangering the model of the person flying on your frequency. Equally as important, the person flying will not interfere with your equipment while you are operating "closed circuit". RC Manufacturing must have anticipated that it would be hazardous to require the transmitter switch to be turned on to operate this feature, since removal of the plug would allow normal transmitter operation if you forgot to turn the transmitter off first. Regardless of the reason, they went a step further and incorporated a method of "killing" the RF section of the transmitter and turning on the encoder simultaneously when the plug is inserted. This means that there is no reason to turn on the transmitter switch until your frequency is clear and you are ready to fly.

RECEIVER

The receiver uses a Hi-Q double tuned RF bandpass filter. The coils are wound on nylon forms with hex adjusting cores. The oscillator appears conventional and is coupled to the mixer's base. The current trend seems to be to couple the oscillator to the emitter of the mixer. Theory seems to indicate that coupling both signals to the same transistor element gives the best noise figure. It's doubtful that this point will be settled or whether it's even important enough to pursue, but the excellent noise characteristics of RC Manufacturing's receiver seems to add fuel to the single element theory. The output of the mixer is coupled to the IF amplifer through another Hi-Q bandpass filter which consists of two Hi-Q IF transformers top coupled with a capacitor. All of the IF transformers used in this receiver have an unloaded Q of 110 compared to the normal Q of 70. The IF



R/C Manufacturing excellent charging system with twin indicator lamps.

amplifier is uncommon (except for Heath Kit) in that it is directly coupled and provides "lumped gain." This allows simple effective AGC that, if properly designed, is not subject to the complications of controlling multiple stages. A third Hi-Q IF transformer couples the IF amplifier to the detector. A transistor detector is used similar to state of the art with diode bias threshold stabilization. Series resistance is used in the coupling to the pulse amplifier and, in conjunction with the pulse amplifier's base emitter junction, allows only the upper portions of the waveform to pass, eliminating "trough distortion." A sync amplifier uses the first pulse in the pulse train to set up the eight channel integrated circuit decoder which is commutated by the remaining pulses in the pulse train. The eight channel decoder is housed in a single integrated circuit instead of the usual two-channel-per-IC package. This is undoubtedly a more expensive method as the IC chip is MSI (medium scale integration) whereas the dual flip-flop types normally used are common building block type circuits that have been in use for several years. Each output from the eight channel encoder is filtered to eliminate environmental radio frequency "noise." This is uncommon as it takes PC board space and increases the manufacturing cost. The results were gratifying; we conducted tests with the reciever antenna wrapped around the servo leads without appreciable range loss or system noise due to locally generated interference. We do not recommend this and, in fact, RC Manufacturing, while explaining that their design efforts were directed toward minimizing environmental noise, recommended that the antenna be routed as per commonly accepted practice (away from servos).

Another interesting and unique feature of the receiver is the use of a signal locking feedback circuit between the sync circuit and pulse amplifier input. This circuit insures that, on low level signals, each entire pulse train will be either accepted or rejected. This is not the usual Schmidt trigger type circuit, which works on each pulse, but a design innovation that uses hysterisis to examine entire pulse trains. It eliminates the catastrophic condition where, as a model enters a null or encounters locally generated noise with low signal level, the pulse train gives erroneous information to the decoder, and hence to the servos and they, in turn, become erratic and draw more than normal current. This, in turn, lowers the battery voltage which aggravates the situation by decreasing receiver sensitivity, becoming

regenerative, and control cannot be restored, resulting in a crash. A more easily understood example can be demonstrated during ground range tests. On some systems the servos will run to extremes, at the fringe of maximum distance, due to environmental noise (servo leads emittingRF, servo motors, etc.) and characteristics of the receiver (noise sensitivity, detector, pulse amplifier and sync stage, etc.). The severity of servo excursion, during range checks, from what is commanded, is a good guide to how severe the results will be in the air under similar circumstances. Some systems lose so much range, several steps back toward the model are necessary to restore operation. We hesitate to evaluate RC Manufacturing's receiver as perfect in the above respect, but we could find no trace of system noise causing servo excursion, and signal drop out is cleanly abrupt. We called Ed Thompson (the designer) about the near perfect environmental noise operation of the system and he explained that we could increase the noise sensitivity of the receiver and observe the signal locking action better. We increased the receiver sensitivity, as directed, until at fringe operation, we could detect the signal locking circuit rejecting pulse trains that were below minimum amplitude. This was evidenced by slower servo action only and at no time did any servo become erratic. All servos dropped out at exactly the same time (with some systems servos drop out individually). We found that we could turn off the receiver or transmitter, in any sequence, without the servos darting toward extremes due to system noise.

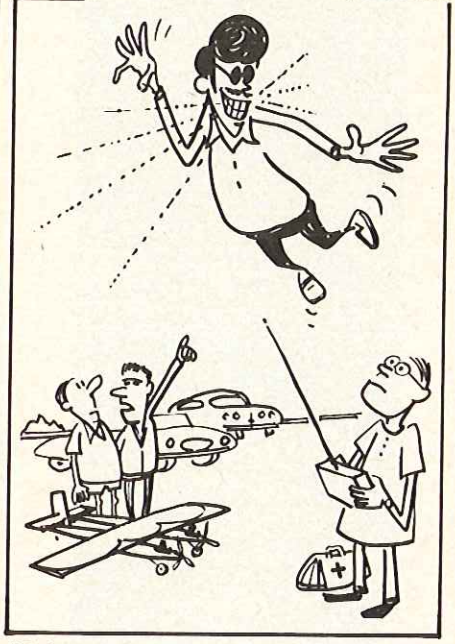
The receiver sensitivity was measured at 1.8 microvolts and the selectivity measured at -6DB at 3KHZ. The use of HiQ IF transformers by RC Manufacturing and their unique If bandpass filter gives the receiver a decided selectivity edge by improving the If curves shape factor; at ± 50 KHZ the receiver is approximately 80 DB down, which amounts to up to 25 DB better than other systems we have tested. Image rejection was above average, and far superior to single tuned RF inputs; both RF coils tune sharply. AGC was effective to the limit of the signal generator and no "overload" was evident with the receiver and transmitter antennas touching each other at the flying field. All decoder pulses were square with extremely fast rise and fall times due to the

more parts than recently announced IC servos. The servo amplifier fits comfortably on a single PC board. Servo deadband is almost non-existent and we were unable to measure it accurately (RC Manufacturing said the average was around ±.25%). We did not receive specifications on servo power or speed but they were both above average. In actuality, we would say they were noticeably stronger and faster than most others we have tested using the same mechanics and motor. Servo smoothness is exceptionally good. The Kraft-Hayes KPS-11 servo mechanics are standard and RC Manufacturing is currently developing other types for later announcement.

BATTERY PACKS AND CHARGER

Both transmitter and receiver battery packs use U.S. made 500 mah nickel cadmium batteries. According to RC Manufacturing these batteries have a re-sealable vent and will vent excess internal pressure when necessary then re-seal themselves. A 250 mah flight pack may be used and RC

Arcy by Bill Berns



"Twice a year Arcy has his dentist check out those special fillings . . . ."

Manufacturing is expecting cases for these batteries from Dick Rehling soon (D & R).

The charger supplied charged both battery packs at a nominal 40 ma. It had a slight taper which was self adjusting (constant current). One feature of the battery charger is that when one battery pack is removed the charging current on the other one doesn't rise, which is common with the dual type chargers. This was accomplished by rectifying both halves of the stepped-down AC. One battery pack uses rectified positive alternations and the other uses rectified negative alternations, so there is no loading interaction.

Subminiature connectors are used throughout for the airborne system. These connectors are gold plated and are supplied by Multicon. They have a proven record of dependability and are the same as used by Kraft systems. The receiver switch harness has a flange mounted charging receptacle wired to the off side of the switch for charging without distrubing the airborne equipment. The "servo service" receptacle is the same type used for battery charging and can be mounted through the side of the model, if desired. If the charger is connected to the "servo service" receptacle by mistake, or vice versa, no damage will occur. A separate connector is used between the battery pack and switch harness so you can replace the battery pack or move it to another model without removing the switch harness. A servo extension cable is supplied so that the aileron connection will not disturb the connector block or receiver packing.

FLIGHT TESTS

From the foregoing description you would expect good flight performance; at least we did. To make a lengthly description of RC Manufacturing's system flight evaluation short, it was excellent. From the smoothness of the control stick to the precise smoothness of the servos we could not find a fault in this system's performance. It has been flown with the transmitter antenna partially and fully collapsed; with the receiver antenna wrapped around the servo leads; and with transmitters operating on adjacent channels. We used the "servo service" feature; and we flew it on successive days without charging overnight. We found that this system was as good or better than the best we have tested with features unique to itself. We are convinced that whether it's used for sport, pattern, or pylon it will compliment the user's flying ability. The small size and low weight of the transmitter alone allowed us to concentrate more fully on the model in flight; a "plus" especially for pylon racing where total attention is needed. The transmitter is thinner than any tested and allows a fuller grasp which eases fatique when your sailplane is in a thermal or you are flying your 20 oz. fuel tank job. The transmitter balance was perfect for us and gave the impression that all we had in our hands was two control sticks.

SUMMARY

As you can tell from our test data so far we are deeply impressed with RC Manufacturing's new system. To say that we are not prejudiced would be a lie. Each part of our testing prejudged in part the succeeding parts. To start with we had no doubt in our mind that a system designed totally by Ed Thompson would be good, so we expected just that. But, we didn't fully expect the

system we received. As we proceeded with our tests we could hardly wait to advance from inspection to technical to flying parts of the test. Each phase of our tests gave us reason to expect faultless results of the next phase. To say we did not give an accurate report would be a lie also as we passed this system around to those available for their perusal and we always received agreement with our findings.

A contributing editor, Dick Sonheim, visited RC Manufacturing's factory in Carmichael, California, a few months ago and found an efficient, modern facility with full service capability, staffed by highly qualified personnel. We welcome RC Manufacturing into the radio control field and have no doubt that Ed Thompson will keep his new company in the foreground of new developments and innovation as he has in the past as our technical editor, since the dawn of digital proportional radio.

Overall we rate the Series 800 system as an outstanding system. It is one of the finest proportional systems we have ever tested. It is a top dollar buy at $360.00, and we enthusiastically approve and recommend it for your consideration. □

SHOESTRING

everything is flat against the table. The oversize holes in the fuselage sides allow the shafts to position themselves parallel to each other, which ensures a straight wing.

Temporarily remove the tip ribs and slide the remainder of the wing ribs onto the shafts and locate on the marks. Glue and pin the 1/16" x 1/4" leading edge strip and the 3/16" sq. trailing edge to the ribs and the fuselage root. Now glue the ribs to the shafts with Titebond glue and a small paint brush. Return the airplane to the flat surface and the ¼" sq. jigging strips, and add the 1/16" sheeting and the capstrips. When

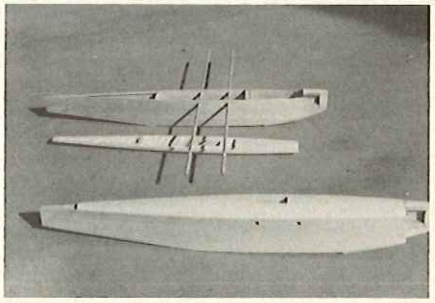
completely dry, the wing should be rigid, and you can now sheet the top of the wing and finish the cap strips. Add the ½" sq. leading edge, tip blocks, aileron linkage, trailing edge and fillets. The aileron linkage is made from 3/32" music wire in brass tubing and is first tack cemented to the 3/16" sq. T.E. strip. Next, the 1¼" x 3/8" trailing edge stock is notched to fit over the linkage and then epoxied over the tubing portion of the linkage.

The top fuselage block and front hatch is made first from one piece of 3/4" x 3" sheet and is cut apart after shaping. Tack cement into place and rough shape, then remove and hollow for lightness. A Dremel Moto Tool is really handy for this operation. On Quarter Midgets, where weight is so critical, all blocks should be hollowed. If some care is taken in wood selection and in finishing, this airplane will weigh in right at 2½ pounds, plus or minus a couple of ounces depending on the radio equipment and the engine used. Set the hollowed top block aside for now and build the motor mount.

When the motor mount unit is finished, the maple motor bearers will protrude out the back about ¼" and will plug into the two holes cut into the firewall. With the cheek cowls and the chin block this gives a very rugged front end. If you have been running .60's, it may not appear strong enough but it is more than enough for a .15. Begin by epoxying the two maple motor bearers to the ½" sheet side block. If an engine other than the O.S. Max is used, move only the lower engine bearer to clear the crankcase. Cut and epoxy the other pieces of ½" sheet to complete the block and then epoxy it to the firewall. Fit and epoxy the 3/4" sheet chin block and the top fuselage block that you prepared earlier. Rough shape the front end but leave the upper fuselage sides flat to facilitate the addition of the cheek cowls. Add the cheek cowl blocks (hollow first) and decide if you will cover the engine. The cowl can be made

from a balsa or foam block which is shaped with the rest of the front end and then covered with glass cloth and Hobbypoxy II and then hollowed to clear the engine. I can't tell any difference in speed, with or without the cowl, but it looks better in place! The same is true for the wheel pants.

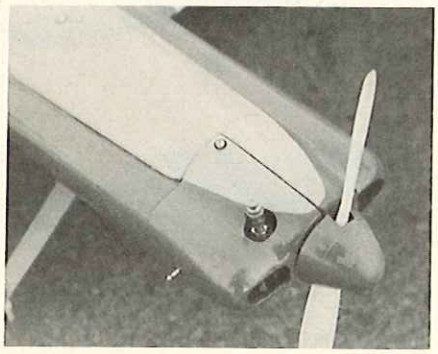
Finish shaping the fuselage and make the tail wheel bracket from 1/16" wire in brass tubing. The completed unit is then epoxied to the rear of the fuselage with a piece of glass cloth or nylon reinforcing tape for additional strength. I have tried using smaller wire and smaller tail wheels but they break and the tires come off the hubs. Make a small fillet of epoxy around the wing root and smooth with your finger.



Construction views of Shoestring fuselage. Note arrowshaft wing spars.

Epoxy the stabilizer and the rudder onto the top of the fuselage and carve the hatch for the radio compartment and you are ready to finish. I MonoKoted the wings and used the new K & B Super Poxy on the fuselage and tail group. Trim was done with paint around the cheek cowls and foreward fuselage and MonoKote trim sheets for the rest.

The servos, in their tray, are mounted on 3/8" x 1" pine molding. This is the molding that is used around the bottom of most indoor walls. This molding provides enough surface area for trouble free glue joints to the fuselage sides. Set up the aileron and elevator so as to get minimum movement. The ailerons should move about 3/16" in each direction and the elevator ¼". The rudder travel can be greater for easier



Close-up view of Fred Reese's Quarter Midget Shoestring with cowl in place. Note air intake, easy access to glow plug and needle valve.

control responses seem agonizingly slow. I did not feel comfortable with the airplane until I had put in about five flights. Then, the more I flew it, the more I came to like and appreciate its gentle responses. Now I prefer it to my other previous designs. The airplane does not over react to my over reactions and I can fly the pylon course smoothly even in a tense racing situation. The airplane will respond and do what you want it to do, it just takes more stick movement. These flying characteristics will allow you to take advantage of the speed and the Shoestring does offer a speed advantage.

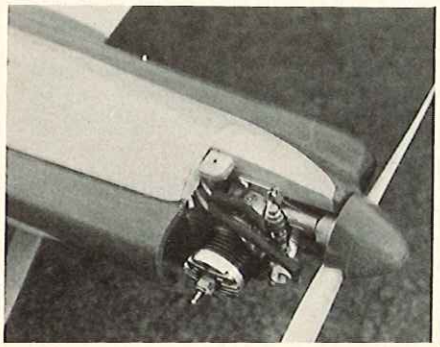
If you haven't tried Quarter Midget racing yet, start now. By the way, wing kits for the "Shoestring" are available from your local hobby shop or from "House of Balsa", 2814 E. 56th Way, Long Beach, California 90805, for $10.95.

ground handling.

Before flying, recheck all control surfaces for alignment and free movement. Use an engine that is sufficiently broken in to give a reliable idle. I say this because many of you will be starting with a new engine.

The first flight will probably be a surprise to you, and you may not like it. I didn't! The airplane goes very fast and the

With the Shoestring's cowl removed, there is complete access to all parts of the O.S. Max .15 engine.



WINDFREE

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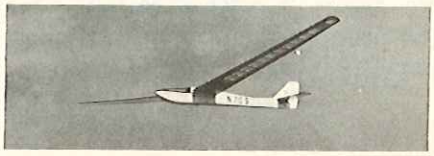


(15) Trim the spars, leading edge and trailing edge off flush with the root and the tip rib.

(16) Drill the holes in ribs R2-1 and R2-2 for the 3/16 O.D. brass tubes. File a sharp edge on a piece of ¼" diameter brass tube and use this for a cutter. Guide the cutter with your fingers and the top spars. Keep the tube tight against the spar as you

drill the holes. Don't epoxy the brass tubes in place, yet. Take some time with this step. If the holes are accurate, and the tube touches the spar, then the installation of the wing wires in the fuselage will be much easier.

(17) At this point the right wing panel should lack the 3/16" root rib (W2-0), the 1/16" sheet planking at the root from ribs 1 to rib 4, the tip block, the cap strips and the rear shear web on both spars and the brass tubes.

(18) Repeat the above steps and construct the left wing panel.

(19) When both panels are at the stage of completion as described above, the brass tubes are installed. Plug the end of each tube with 1/16" balsa using the tube itself as the plug cutter. Epoxy the plugs in place with 5 minute epoxy from the outside. Remove any tarnish from the outer surface of the tube with sandpaper and wipe the surface clean with a cloth and acetone. When the tubes are clean, slip them into the wing with the plugged ends toward the tip. Be sure there are no burrs on the inside diameter of the tubes or the ends of the 5/32" diameter wires. Press the short 5/32" diameter tooling wires through the holes in the 1/16" plywood jig. Use this jig to position the tubes in both wing panels. Pin one panel to the work surface and insert the wires of the jig into the tubes. If the jig does not slip into place easily, elongate the holes in the rib R1-1 and R1-2 until the tubes can align with the jig. Slide the other wing panel over the jig wires. The wing panels should now be butted against the 1/16" plywood sheet and flap on the work surface. All four tubes should be resting against the top spars. Clamp the tubes in place with clothespins. Be sure that the wing panels will still slip over the jig wires. When the brass tubes are aligned with the jig, put a couple of spots of 5 minute epoxy on each tube to secure it to the top spar.

(20) When the epoxy has cured, remove the wings from the work surface and set aside until the fuselage and stabilizer are built.

FUSELAGE

(1) Cut out and lightly sand the fuselage sides.

(2) Pin the right fuselage side over the plan and draw light pencil lines across the sides. Use the marks on the plan above the station letters (B through K) and the marks located between the top and side views of

League of Silent Flight

LEAGUE OF
SILENT FLIGHT
P.O. Box 2606
Mission Station
Santa Clara,
California 95051

By Le Gray

Perhaps you are curious about the LSF . . . the League of Silent Flight. Many people are these days, because the LSF is attracting the attention of R/C sailplane fliers throughout the world. Recent press coverage has given many details, but other points may also be of interest.

The LSF is an association of people who have a common interest . . . R/C soaring. It is designed for the individual . . . it is a "program" . . . it is not a club. Participation in the LSF neither conflicts with nor requires club membership. In fact, many clubs find that group participation in the LSF program can excite new areas of interest and be the basis of new growth.

The League of Silent Flight Soaring Accomplishments Program provides a realistic challenge to the serious R/C soaring enthusiast through a series of meaningful standards of flying proficiency . . . goals that can be attained at most local flying sites. Membership in the League can only be earned . . . by personal, documented performance. Membership cannot be "bought". . . there are no membership dues or fees.

To become a member, an R/C sportsman must fulfill the requirements of Level I of the LSF Soaring Accomplishments Program; a 5 minute thermal soaring flight; a 15 minute slope soaring flight or a second 5 minute thermal flight, and five spot landings within 3 meters (9.84 feet) of a target point.

Advanced levels in the Soaring Accomplishment Program are progressively more difficult. Level V, for example, requires a 2 hour thermal flight, an 8 hour slope flight, a 10 km (6.21 miles) goal and return flight, as well as considerable contest success.

Only members . . . sportsmen who have achieved Level I or higher . . . are privileged to display the LSF insignia. The LSF emblem on a jacket or sailplane is a symbol of proven performance . . . it has been earned . . . and is displayed with pride anywhere in the R/C soaring world.

The LSF is growing – fast – but the "grass roots" concept, the personal challenge for the independent sportsman, will be maintained, because that is the League of Silent Flight.

Serious sportsmen are invited to associate with the LSF by submitting the following to the Executive Board: (a) name; (b) mailing address; (c) FAI organization affiliate and license or membership number; (d) radio operator's license number; and (e) a statement similar to the following:

> "I, (the undersigned), support the philosophies, concepts and criteria set forth in the Bylaws of THE LEAGUE OF SILENT FLIGHT and give notice herewith of intention to attain Level I of the LSF Soaring Accomplishments Program, and by so doing, earn full recognition and privilege of membership."

All correspondence to the LSF should include at least **16** cents in stamps for return postage. Correspondence should be addressed to The League of Silent Flight, P.O. Box 2606, Mission Station, Santa Clara, California 95052, USA.

the fuselage. These lines will locate the fuselage vertical braces. Mark the edges of the fuselage sides to show where the line is located. Mark the position of the front of the 1/8" plywood fin base (F2-8).

(3) Remove the right fuselage side and pin both sides together so that the lines you drew are between the two sides. Mark the position of the lines on to the edges of the left side.

(4) Remove the pins and draw the lines on the left side. Be sure you have a left and right fuselage side.

(5) Pin both fuselage sides to the work surface so that the lines drawn on the sides are facing up. Do not pin the sides over the drawing.

(6) Cement and pin F2-1 and both the bottom longeron and the top rear longeron in place. Saw cuts will permit the 3/16" sq. top longeron to bend in the area of fuselage station E.

(7) Glue the 1/8" square vertical brace at station G in place.

(8) Glue the 3/16" square canopy rest to the top edge of the fuselage side. Be sure it extends to the front edge of the fuselage.

(9) Glue the 1/8" square vertical brace at B in place.

(10' Glue the 3/32" x 1/4" spruce longeron in place.

(11) Glue the 1/16" plywood doubler (F2-5) in place. Be sure the holes for the wing wires are aligned with the 5/32" holes in the fuselage sides.

(12) Glue the 3/16" square vertical braces in place. Note how the braces are notched to fit over the 3/32" x 1/4" spruce longeron. A 1/16" scrap shim is placed under the 3/16" square brace at station E and F between the bottom longeron and the 3/32" x 1/4" spruce longeron. (See section E on the drawing.) Use the plywood bulkheads F2-3 and F2-4 to position the 3/16" square braces in respect to the wing wire holes.

(13) Glue the remainder of the vertical braces in place except at station K.

(14) After the glue has dried, cut the fuselage lightening holes out of the plan and use them for templates to mark the holes on the fuselage sides. Cut out the holes in the sides and sand them smooth.

(15) Glue in the vertical brace at station K.

(16) Bevel the longerons to fit the fin. See the top view of the fuselage for the angle.

(17) Pin the canopy base (C2-2) in place on the fuselage. Be sure you have cut the base slightly undersize. This is done so that when the canopy frame is covered with the clear plastic, the plastic will be flush with the fuselage sides. Allow a ledge the thickness of the plastic on both sides, when you pin the canopy base in place.

(18) Glue all of the fuselage cross braces in place. Do not install any bulkheads at this time. Cement and pin the 1/16" sheet balsa, rear top fuselage covering in place from fuselage station I to the front of the 1/8" plywood fin base (F2-8). Use a 90° triangle to check the fuselage to be sure the fuselage cross section is square.

(19) Sand the 1/8" sheet balsa fin parts so that the edges to be cemented are straight and the corners are sharp. Laminate the lower rudder hinge between two sheets of 1/16" balsa scrap and epoxy in place in the plywood fin base. Sand the balsa flush with

the 1/8" plywood after the epoxy has cured. Pin and cement the fin parts together over the plan (F2-6, 7, 8, and 9). When the cement is dry, glue the assembly in place in the fuselage.

(20) A 3/32" O.D., 1" long, brass tube is epoxied into F2-8. Use 5 minute epoxy and align the tube by sliding the 1/16" diameter wire through the tube so the wire projects out each side. Use the wire as an indicator to show mis-alignment. Be sure the tube is 90° to the fin when looking from both the top and rear of the fuselage.

(21) This step is one of the most difficult, so take your time. You can make or break the airplane at this point. The object of this step is to have both wing panels aligned to the fuselage so that each panel will be at the same incidence and dihedral angle. Both panels should project from the fuselage at the same angle when viewed from the top. Slip the plywood bulkheads (F2-3- & F2-4) into place at fuselage stations E and F. Check the wing wires with the drawing. Bend as required so that they both form the same angle. Sand the wing wires to remove any corrosion and wipe clean with acetone. Slide the wing wires through the fuselage sides. Install the "J" bolts and nuts. Center the wires with the center "J" bolt and tighten the center "J" bolt on each bulkhead. Slip the wing panels over the wires and place the entire assembly on two 2 x 8 boards, on edge, so that the fuselage is suspended between the boards. If the fuselage is aligned with the wing as described above, then the brass tube installation in the wing and the fuselage assembly are accurate. Remove the wing panels and the wing wires and glue in the two fuselage bulkheads. Before the glue can dry, slide the wing wires in place and install the J-bolts. Slide the wings in place and repeat the alignment. When the wing and fuselage are aligned, let the assembly set until the glue has dried. Epoxy the wires in place as described at the end of this paragraph.

If the wings do not align with the fuselage, then the fuselage structure is misaligned or the brass tubes in the wing are not installed properly. Elongate the holes in the fuselage as required. If the wings do not rest flat on the 2 x 8 support boards, slide the wires through the fuselage as required. The wing panels must both be at the same angle of attack. The holes in the 1/8" plywood bulkhead will have to be enlarged before the wire can be moved. When the wing/fuselage assembly is aligned, put a couple of drops of 5 minute epoxy on the join between the bulkheads and the fuselage sides to fix their location in the fuselage. Put a few more spots of epoxy on the wire/bulkhead joint. When the epoxy has cured, remove the wings and glue the bulkhead in place. Force the glue in the joint between the fuselage and the bulkhead. To prevent the epoxy from flowing all over the place, build a masking tape dam on the bulkhead so the fluid epoxy is retained around the wire and J-bolt until it can cure.

(22) Check the shape of the tow hook by laying it over the plan, correct any variations. After the assembly is cured and dry, install the 3/32" diameter wire tow hook. Solder the tow hook fuselage retaining washer in place. Use acid core solder. Be sure the tow hook is tight against F2-3.

(23) Glue the 1/8" balsa die cut

bulkhead (F2-2) in place.

(24) Glue the 3/8" nose fairing block in place. Use the canopy base to locate the position of the block. Allow clearance so the canopy can be removed.

(25) Slip the 1/16" plywood doubler (F2-12) over the tow hook. Cover the bottom of the fuselage. The 3/16" sheet grain runs crosswise while the 1/16" sheet grain runs lengthwise. Do not cover the top of the fuselage until the controls are installed.

(26) Sand the front of the fuselage flush and glue on the nose block.

(27) Slot the fin (F2-9) for the rudder hinge. This is as far as the construction of the fuselage can progress at this time. The canopy must be in place before the nose is shaped.

CANOPY

(1) Notch C2-1 and C2-3 for the 1/8" diameter dowels. Place wax paper over the fuselage in the area of F2-2 and the 3/8" nose fairing block so the canopy will not be glued to the fuselage.

(2) Glue and pin C2-1 and C2-3 to the canopy base. Pin C2-1 to the 3/8" fairing block and C2-3 to fuselage bulkhead F2-2. The wax paper will provide clearance.

(3) When the glue has dried, remove the canopy and glue the 1/8" diameter dowels in place. Check the fit of the canopy assembly with the fuselage.

(4) After the glue has dried, trim off the 1/8" dowel flush with C2-1 and C2-3.

(5) Glue the 3/16" square canopy cross brace in place.

(6) Drill a 1/16" diameter hole in each side of the fuselage. Locate the hole about 1/32" of an inch lower than the lower surface of the 3/16" square canopy cross brace. Use a piece of 3/16" square scrap to assist in locating the holes from outside the fuselage. Press short lengths of 3/32" diameter tube into the holes and epoxy in place. Cut a piece of 3/32" diameter tube to the length of the 3/16" square canopy cross brace. Slide a length of 1/16" diameter wire through the tubes in the fuselage sides. Have the 3/32" diameter tube on the wire and between the fuselage sides. Coat the bottom of the 3/16" square canopy cross brace with 5 minute epoxy and pin the canopy in place on the fuselage. When the epoxy has cured pull the 1/16" diameter wire and remove the canopy. Do not complete the canopy at this time. Set it aside and proceed with the stabilizer and rudder.

TAIL SURFACES

(1) Place wax paper over the stabilizer drawing.

(2) Pin the 3/16" x 1/4" leading and trailing edge pieces in place.

(3) Cut the 3/32" x 1/4" balsa strips to fit between the leading and trailing edges. Cement and pin the strips in place. We will call these strips "ribs."

(4) Glue and pin the 3/32" x 1/4" spruce spar in place over the ribs.

(5) When the cement has dried remove the pins from the leading and trailing edges and shim them above the work surface with 1/16" sheet scrap. Be sure the shim supports each rib where it contacts the leading or trailing edge.

(6) Cement and pin 3/32" x 1/4" ribs in place over the spar.

(7) When the stabilizer assembly has dried, remove it from the plan and sand the tips and root flush with the ribs.

(8) Cement the 1/16" sheet stabilizer root ribs and tips in place.

(9) When the cement has dried, sand the 1/16" sheet root ribs to the contour of the 3/32" x 1/4" ribs.

(10) Cut the 3/32" diameter brass tube to the lengths shown on the plan. Clean the tubes with sandpaper and then wipe off with a cloth and acetone.

(11) Sharpen the end of the tubes and push them through the root rib of the right half of the stabilizer.

(12) Cut two lengths of 1/16" diameter wire to the lengths shown on the plan. Clean the wires with sandpaper and acetone.

(13) Slide the wires into place in the left hand half of the stabilizer. Bring both halves of the stab together so the root ribs butt together. Pin the assembly to the work surface. Place a couple of drops of 5 minute epoxy on the wires and tubes to attach them to the stabilizer structure.

(14) When the epoxy has cured, remove the assembly from the work surface and tie the tube and wire to the spar with thread. Be neat! Everyone will be able to see your work through the MonoKote or Solarfilm. Coat the wires, tubes, and spars where they attach to each other, with epoxy.

(15) Sand the end of the forward stabilizer fairing (S2-3) until the 1/16" diameter hole is exposed. Cement the fairing in place on each half of the stabilizer. Use the 1/16" diameter tie wire to locate these fairing blocks on the stabilizer.

(16) Slide the 1/16" plywood control horn over the pivot wire of the left stabilizer half. Use the horn as a pattern to show where to cut away the 1/16" root rib. When the horn will fit flush into the root rib, glue it in place.

(17) Some builders will object to running the control rod clevis through a bare hole in the 1/16" plywood control horns. The holes in both the rudder and stabilizer control horns may be bushed with a 3/32" O.D. brass tube. Epoxy a short length of tube in the hole. When the epoxy has cured, file the brass tube flush with the surface of the control horn and remove any burrs from the inside of the tube.

(18) Sand the stabilizer tips, fairings, root ribs, leading and trailing edges until the assembly is smooth and streamlined. Put large fillets of glue inside each rib where they contact the leading and trailing edges. Refer to the plan for the cross section of the stabilizer tip and the fairing.

(19) Sand the front of the rear stabilizer fairing (F2- 10) so it clears the forward fairing. Sand the fairing to the airfoil shape of the stabilizer. Be sure the 3/32" diameter brass pivot tube in the fin projects about 1/16" out from each side of the fairing. When the fairing is completed, cement in place on the fin. Use a pattern, cut from the plan, to position the fairing at the proper angle of attack with respect to the fuselage.

(20) Cement a piece of 1/8" scrap balsa in the hole in the plywood fin base (F2-8) as shown on the plan. This will provide a surface to attach the covering material to the fin.

RUDDER

(1) Place wax paper over the plan.

(2) Sand the 1/8" sheet parts R2-1 and R2-2 so the edges to be glued are straight and the corners are sharp.

(3) Pin the 1/8" x 3/8" strip together over the plan.

(4) When the assembly is dry, sand it to a streamline shape.

(5) Slot the rudder in the location shown on the plan, for the rudder horn.

(6) Slot the rudder for the hinges. Trim the hinges as shown on the plan so the slots do not have to be so deep. If there is difficulty making slots in the "thin" 1/8" sheet use the lamination technique as explained in the fuselage section of this article. Do not install the rudder on the airplane at this time.

(7) Cover the rudder. Cut through the covering material and epoxy the control horn in place.

FINISH

In this section all of the components of the airplane are brought together for final fit, sanding and covering.

(1) Fit short wood shims between the brass tubes and the lower spars.

(2) Rest the wing panels on their leading edge. Use something to support the panels in this position. Mix a volume of Hobbypoxy II, sufficient to fill the voids between the brass tubes and the spar. Pour the epoxy into the spar cavity and around the brass tube. Be sure the ends of the tubes are plugged.

(3) When the spar cavity is full of epoxy, pin the rear shear webs in place. There should be enough epoxy in the spar so that when you pin on the rear shear web, the epoxy is squeezed out of the joints. Let the wings remain resting on their leading edges until the epoxy has cured.

(4) Cap strip all ribs except W2-1, W2-2 and W2-3. Sand off the shear web that projects above or below the spars.

(5) Cover the wing root top and bottom from ribs W2-1 to W2-4 with 1/16" sheet balsa as shown on the plan.

(6) Sand the sheet covering flush with the root rib. (W2-1)

(7) Use the tube alignment jig to mark the hole positions on the mating rib blank (W2-0). This is done by sliding the wires into the wing tubes so they project out about 1/16". Align the mating rib blank and press lightly to mark the position of the holes. Remove the rods from the wing and drill two 3/16" diameter holes in W2-0. Cement the blanks onto the wing so that the holes align with the tubes.

(8) Cement the wing tips in place.

(9) After the glue has dried, the wing panels are now ready for final sanding. Sand the rear of the top trailing edge sheet until the rear edge of the trailing edge is about 1/16" thick. Sand the bottom of the leading edge to the radius shown on the plan. Sand the top leading edge sheet to complete the airfoil. Take your time with this step and check the work as it progresses. Cut out the center section planking sheet between rib R2-3 and R2-4 as shown on the plan. Sand the sheet covering to a smooth curve. Sand the tip block to the cross section shown on the plan. Sand the 3/16" root rib (W2-0) to the contour of the airfoil.

(10) Slide the wings in place and note how the root ribs do not fair into the fuselge. Remove the panels and sand the root rib at the proper angle and curve so that when the wing panels are in place the root rib lays flush on the fuselage side. This will take several trial fittings before the fit will be satisfactory.

(11) The wing panels are now complete except for covering. MonoKote or Solarfilm

are good covering materials. Transparent yellow or orange gives excellent visibility during high thermal flights.

(12) Attach the rudder to the fin, temporarily, by slipping the hinges into the slots.

(13) Install the stabilizer.

(14) Build a battery support in the nose of the airplane. Use 1/16" plywood scrap. The batteries must rest against the nose block. The receiver is located behind the battery and the servos are behind the receiver.

(15) We prefer stranded steel control cables. Pylon Brand .030" diameter is available at your hobby shop.

(16) Mount the radio control system so that the inertia loads during hard landings are not concentrated on one small area of the structure. Be sure the clevis or Kwik-Link to the rudder horn rotates easily on the threaded portion of the control cable. It must rotate or the push-pull cable will twist and cause the system to bind. The rudder horn is mounted at an angle to the hinge line so that as the rudder moves the horn will impart a twisting motion to the clevis. If the horn is located 90° to the hinge line, then this rotary motion is eliminated but a small amount of air drag will result. Use double sided tape to mount the components of the radio system. The switch can be taped to the receiver case and a push-pull wire to the switch can be extended through the fuselage side.

(17) After the control system is installed, cover the top of the fuselage with 1/16" sheet balsa.

(18) Round off the external corners of the fuselage as shown in sections B-B, E, and H. Fair the rear of the fuselage into the fin.

(19) Install the canopy frame and sand the fuselage and canopy as an assembly. Leave the fuselage slightly larger than the canopy so that when the celluloid is installed the fuselage and canopy will be flush. Sand the nose block to fair into the fuselage.

(20) Remove the canopy frame from the fuselage and paint the frame black or zinc chromate. Cement the plastic over the frame. Pin the plastic in place while the cement dries. Push the pins through a strip of scrap balsa so the balsa presses the plastic flat against the canopy structure. When the cement has dried, remove the pins and wood and trim the plastic flush with the canopy structure.

(21) Trim the canopy with 1/8" wide trim tape.

(22) Sand any bumps or rough spots on the surface of the fuselage, fin and stabilizer structure. Cover these parts with MonoKote or Solarfilm and trim.

(23) Epoxy the rudder hinges into the rudder.

FLYING

(1) Windfree will fly "right off of the building board." If the wings are aligned properly the airplane should not require any ballast.

(2) Warp about 1/8" to 3/16" of washout into each wing panel. This will cause the airplane to have a smooth stall without one wing tip or the other stalling early.

(3) If the wings slip on and off the fuselage wires too easily, bend the forward wire downward very slightly. Make the bend about 3" out from the fuselage. This "kink" will provide enough drag to retain the wing panels on the wires. □

SUNDAY FLIER

from page 16

the other theoretical aspects of soaring keep churning on. Meanwhile, the practical aspects of the sport, which is the area that you and I have to deal with, continue to give us moments of great satisfaction, interspersed with periods of sheer panic.

No matter what airfoil section you're using, or aspect ratio or any of the other various refinements that keep coming up in the discussions, there's one thing that's fairly certain. At least it is as far as I can determine. And that is, if you have any – and I mean any – reasonably good sailplane and you fly it often enough in various weather conditions, sooner or later you're going to get caught in what I some time ago described as "killer" thermals. They're the ones that have so much lift in them that unless you know in advance what to do – and that will depend upon the sailplane that you're flying – the surprise of finding yourself in one of these terrific updrafts will result in either the loss of your plane, or its destruction as you try to escape from the current. Some time ago, when I first talked about these currents, I got a lot of knowing looks and, "Yea, yea, we know." But, as time goes on, I hear of more instances of what I described last August as "thermal narcosis" – a fascination with watching your sailplane go up until you suddenly realize, too late, that you've let it get away from you.

Just this past month I heard of two instances. If the victim of one wishes to insert his experience here, he has my permission. But let me pass on to you the lesson learned by the other flyer.

Dear Ken:

"It" could never happen to me – I'm too careful, I had said. But as I sit here the next morning, mourning the sudden and untimely demise of my Diamant (March, 1972 Sunday Flyer) and trying to sort out what happened, I realize that "it" can happen and sooner or later may happen to anyone. The horrible "it" that brought all this on was getting lost in the clouds. The important thing is not how to stay out of the clouds, but what to do about it when it does happen. Anyone can stay out of clouds, just stay home when they are around or fly low and settle for short flights. However, most of us are greedy when it comes to flying time and/or are always trying for some specific duration goal. In my case it was another one hour flight to finish LSF Level IV.

Several model sailplanes have been lost in the clouds by South Bay Soaring Society members (two were never found). I've even watched it happen, but still I was unprepared to cope successfully with the problem. Since I don't recall seeing anything published on this subject, I thought you might like to give your readers a few tear-stained words of warning.

Here, briefly, is the story. It had been rainy for several days but was breaking up yesterday. Since I had just finished some repairs on my Diamant from a minor fracas the week before and Jeff had a new Nimbus II to test, we were eager to go. As we drove to the schoolyard where we fly, I noticed a lot of very low clouds, maybe about 1,000 feet high and thought of the difficulty in

staying below them. By the time I was ready to fly though, only the broken clouds at a much higher level, probably over 2,000 feet, were in the area. Suddenly the lift turned great and there I was, near cloud base with one hour fever. I was way up and out taking all I could get and beginning to worry about entering the high clouds. I decided that if I did, full left rudder trim and full down trim would probably bring it back down at a reasonable speed, although I hadn't tried it. After about 40 minutes some lower level clouds drifted in and the Diamant started to disappear - - - put plan A into effect and wait - - - several brief glimpses, it's working - - - no it isn't, what next - - - more down elevator - - - there it is, in a steep dive, ease off - - - gone again, now what - - - try full up and left - - - never saw it again. Two men brought back the many pieces from approximately ½ mile away and to the right of where it disappeared. What I hadn't realized was how far the plane had to descend from the high clouds through the low ones, that takes time at a reasonable rate of descent.

The tendency is to panic and try one thing after another which moves the plane all over the sky and it comes out where you're not expecting it. By the way, while all this was happening, I realized that my name and address weren't on the plane anywhere. I had recently installed my new Larson 5RS and had neglected to put my label on the receiver. Fortunately the finders knew where we fly.

What are the lessons to be learned from this story – first, experiment with your plane and know what it will do with various control combinations. Figure out how to get the fastest safe tight circling descent without visual contact. Some planes will come down nicely with full up and rudder, some won't. Some definite full control function, like full trim or full stick, is desirable otherwise you don't know what the plane is doing. Second, as soon as you see that you're in trouble take action and HOLD it until you're in the clear – don't panic. *If you take immediate action and your pre-rehearsed descent includes a tight spiral, the plane is bound to reappear nearly below the last visual contact. As a hedge though, try to have some people watching to the left and right of the assumed location. Third, put your name and address on the plane and radio, just in case.*

I obviously can't vouch for the complete effectiveness of these recommendations, but they sure should help. Others may have additional ideas. If so, I'd sure like to hear them. I don't want this to happen again with disasterous results. But, I'm also sure that I will tempt fate many times more by trying to outlast the stop watch.

Marshall Watson

So, like Marshall says, experiment with your model, determine what you would do in advance, because one of these days, it will be you. Actually, Marshall wasn't really in a "killer" thermal, but the result was the same – out of sight flight.

I'd like to close this month by again thanking all of you who write in to tell me about your experiences. When they are of general interest, I like to publish them. But

many of them come with photos which are essential to the story you tell, yet the photos aren't suitable for publication. For example, I got a real nice letter from Dennis Sumner over in Dearborn Heights, Michigan, telling me about his BT-70. You never saw a prouder modeler than this 17 year old enthusiast with his model — but the picture just won't print well.

What we need is good, contrasty black and white prints about 5" x 7" with a gloss finish. No color.

The other reminder is that due to the volume, if you want a personal reply, enclose a stamped, self-addressed envelope. Otherwise, I'll use it sometime in the column if it is of general interest to all R/C enthusiasts.

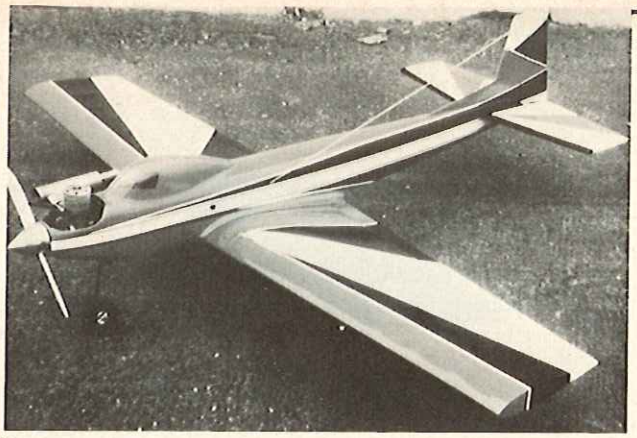
But, whatever you do, keep writing. Your letters are the guiding influence, and the lifeblood, of the Sunday Flier column. We may not be hep to all the advanced technical gobblegook — but I'll bet we have the most fun.

Any takers? □

TAKE A LOOK AT THIS

from page 14

An expanded 48-page catalog which includes 185 new, unusual and extremely useful hard-to-find tools has been published by the Brookstone Company. Brookstone tools are rarely found in stores or other catalogs and many have never been offered for sale before in this country. Among the several new items included in this unique collection are: wire strippers, tungsten carbide grit files, files and drills for plastics, side-action funnels, garnish awls, eight way scrapers, handsaws, and tenon saws. Also included are pruning saws, portable sand blast guns, range finders, fire detector alarms and nylon vise jaws. Plus hundreds of other versatile hand tools and small power



El Camino

The EL CAMINO is capable of all A.M.A. and F.A.I. maneuvers. It features a tapered progressive airfoiled wing. The kit is of highest quality, all parts are accurately machined. An outstanding feature is the indexed construction which makes it easy, fast and accurate to assemble. Kit includes all necessary hardware.

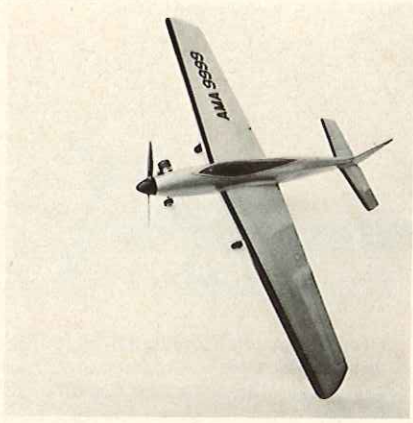
Wing Span: 58"
Wing Area: 625 sq. in.
Weight 6¼ lbs.

KITTED BY J & E ENTERPRISES
1110-D Claudina Place
Anaheim, California 92805

tools. All are highly professional quality tools and sold with a full moneyback guarantee. Available only by mail. Send 50 cents for a 1 year subscription (3 issues) to: Brookstone Company, 2834R Brookstone Building, Peterborough, New Hampshire 03458.

* * * *

J & J Industries, Inc., Model Aircraft Division, P.O. Box 202, Oakhurst, New Jersey 07755, introduces the Banshee, the hottest, most spectacular design yet for highest caliber precision aerobatic competition. Designed by Jersey Jim Martin, one of the country's top pattern fliers, the airfoil, moment arms, and areas of the Banshee are all proven by a long string of contest wins. All this, combined with J & J kit engineering gives you the winner you need for competition flying. The Banshee has a 62" wing span with 630 square inches of wing area and a fuselage length overall of 49¾". The flying weight with conventional tricycle gear is 6½ lbs. with an all-up flying weight of 7½ lbs. with retractable gear. .60 cubic inch engine is recommended. The J & J kit features full length, pre-cut sides; all plywood parts pre-cut from aircraft grade plywood; all balsa formers pre-cut; fin and rudder pre-cut; wing ribs pre-cut; highest grade balsa used throughout; wing tips pre-cut; aluminum engine mount; complete hardware package; pre-bent landing gear wire; pre-formed canopy; and diamond airfoil stabilizer. Available at your dealer or direct from J & J Industries, the price is $54.95.



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Joy Products Company, P.O. Box 374, Menominee, Michigan 49858, has produced a kit of Don Coleman's Cutlass Supreme, the second place pattern winner at the 1971 Nationals. This is the only all-balsa Cutlass Supreme kit approved by Don Coleman. The complete kit includes grade A sanded balsa; pinned hinges; links and rods; aileron linkage; nose gear assembly; aluminum motor mounts; canopy; and rolled plans. Span is 64" and the recommended engine size is .60. Price of the kit is $54.95.

* * * *

Kenneth R. Maunz of 659 Skinnerville, Williamsville, New York 14221, announces the formation of Kerma Sales Co. This firm was established in order to supply club members throughout the country with sportswear and accessories. Among the

SEE PAGE 100 FOR COMPLETE DETAILS!

many items which Kerma will supply are badges, emblems, flags, jackets, jewelry, trophies, uniforms and fund raising programs. It is the aim of this firm to be able to completely supply any club with all its needs. Kerma will be pleased to send catalogs to any interested club member. Requests should be directed to department P1.

The tires pictured are Jerobee Industries, 120702A N.E. 124th St., Kirkland, Washington 98033, latest custom race tire set, now available from your favorite dealer. The rear tires are ground sponge and are glued and trued on Jerobee's new chrome custom wheels. Two long wearing front tires are also mounted on custom wheels. Retails for $9.00 – Part #610. These wheels are also available by themselves for the do-it-yourselver. They are made of durable long lasting cycolac, and have a chrome finish. Selling Price, $3.50 – Part #611. For those who just want the rear tires try part #612. Sponge rear tires, trued on a mandrel for maximum concentricity and absolute traction on all surfaces. Get road hugging performance. $3.50 – part #612.

Royal Products Corporation, 6190 East Evans Avenue, Denver, Colorado 80222, has added a scale Corsair to their line of quality scale kits. The Corsair has always been a favorite among modelers and we feel quite strongly that this particular version should become one of Royal's best selling kits. The kit is all balsa and will come equipped with all necessary hardware. Scale is 1½" = 1' for a total wing span of 61½" and a total wing area of 669 square inches. Fuselage length is 50". Recommended engine size is .60. Retail price for the F4U4 Corsair will be $69.95.

Sterling Models, Inc., Belfield Avenue and Wister Street, Philadelphia, Pennsylvania 19144, manufacturer of wood model kits for the past quarter century, announces that the Kyosho Corporation of Tokoyo, Japan, has been licensed to produce the Sterling line of model boat and plane kits and allied accessories, for the Far Eastern Market.

Mr. Ed Manulkin, President of Sterling Models, Inc., announced that agreement was reached in January of this year, with the final visit of Mr. Hisashi Suzuki, President of

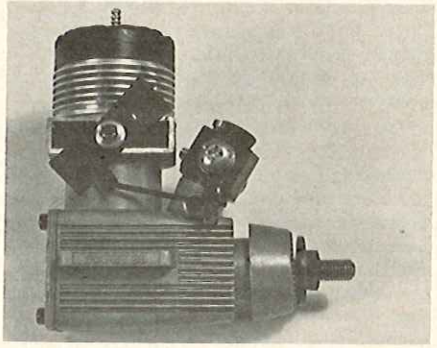
Kyosho Corporation, accompanied by two members of his staff, at the Sterling offices in Philadelphia.

Mr. Manulkin hailed the event as a great step forward, not only in helping to promote better relations between the two countries, but also, "For the first time, it will permit the model builders of the Far East to purchase American designed and manufactured type kits at a price they can afford." He also added that now, for the first time, the vast potential market of the entire Far East is being opened to the products of an American model manufacturer.

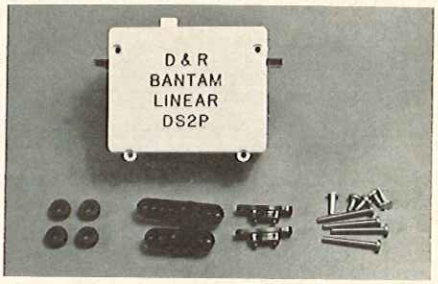
R.E.S. Products, Inc., 6652 Indiana Avenue, Riverside, California 92506, is producing personalized frequency color-coded plaques for transmitter and receiver. Both your name and frequency are engraved on the transmitter plaque. The frequency only is engraved on the receiver plaque. These are adhesive backed and a matched set for your transmitter and receiver is priced at $3.00 including postage and handling. Additional receiver plaques are available for 75 cents each. Frequency and name badges are also available for your shirt or jacket at $2.50 each. California residents add 5% sales tax. Modelers are advised to order direct only from R.E.S. Products.

* * * *

Universal Model Engineering Company, Box 252, Naperville, Illinois 60540, announces that they, the new owners of Universal Model Engineering Co., are now producing the Universal Wheel. Through the application of modern engineering thermoplastic technique and materials, Universal has achieved a more economical means of manufacturing their line of wheels and tires for R/C models and are able to pass on a lower retail price to the modeler. The Universal scale wheels, available in sizes from 2½" to 3¾" in a price range of $4.79 per pair to $5.79 per pair feature a scale hub and tread detail; hubs molded of high strength Lexan®, low rebound thermoplastic rubber tires that remain pliable in all temperatures; fully assembled tires and wheels in six sizes; spoked and smooth hub cap options available; compatible with popular mechanical brakes; featuring variable inflation to suit weight of aircraft; and an overall light weight. The Universal wheels should end scale wheel problems on almost all subjects from 1930 onward and will be at home on any contest or sport ship. Tested, Approved and Recommended by RCM.

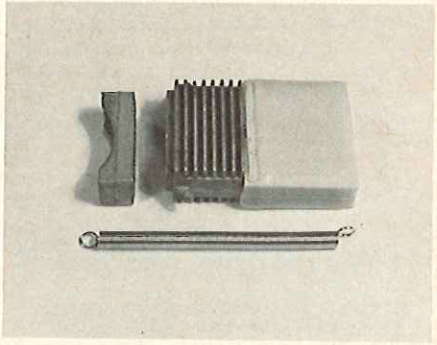


The Testor Corporation, 11500 Tennessee Ave., Los Angeles, California 90064, has produced their Series 21 McCoy .35 R/C engine. Priced at $24.95 the new McCoy 35 Series 21 R/C engine features a Perry Carburetor and an all-new exterior design. This is a fine sport flying power plant which will provide the sport flyer with an easy starting, dependable, and reliable engine for those middle sized models. Tested, Approved and Recommended by RCM.



D & R Products, 27635 Forbes Road, Laguna Niguel, California 92677, has produced the D & R Bantam Linear DS2P servo kit for converting your existing Kraft servos. The use of this servo will permit you to convert a Kraft KPS10 to a linear or rotary output servo without unsoldering any wires while making the conversion. All that is necessary is to remove the motor, pot and amplifier from your servo by pulling out the motor and removing two screws from the potentiometer. Next, press the motor into the D & R servo. Make sure the motor gear is meshed with the number one gear when you press. The motor should fit tight and should never be loose. Install the pot element with two No. 2 self-tapping screws provided in the kit. Use the two fiber washers from your old pot screws. The arrow on the pot should point to the motor. Turn your transmitter and receiver on and plug the servo into your receiver, adjusting neutral by loosening the two pot screws and rotating the potentiometer until the output wheel holes are centered. Re-tighten the pot screws carefully since overtightening may cause the ceramic to crack. Be careful not to short the amplifier with the screwdriver while centering the servo. When the servo has been centered, install in the case using four No. 1-72 x 5/8" screws provided in the D & R kit. Be sure the grommet for the plug wires is in its proper position in the case halves when tightening the case screws. Also make certain that no wires are pinched when the servo is installed in the case. Make certain that the amplifier does not touch the pot element when the servo is assembled. Place a piece of cardboard, paper, or foam between them when installing the amplifier in the case. Complete servo mechanics with the motor and potentiometer is priced at $12.95 per servo. Tested, Approved and Recommended by RCM.

Fibre Foam Products, 6370 E. 22nd Street, Tucson, Arizona 85710, has announced the release of two new products to their line of R/C items. The first is a scale model of the famous WW II Japanese Zero with a 62" span designed for .50 to .60 size engines. This is a high grade balsa kit which includes almost all needed accessories and hardware. Price of the kit is $69.95. The second item is a polyester resin plastic filler for use with wood, fiberglass and plastic. It is ideal for repairing fiberglass fuselages or for constructing fillets on your model. It is easy to sand and extremely flexible. Drying time is approximately 10-15 minutes and the Fibre Foam Plastic Filler will accept any type of finish. Price of the Filler is $2.99 a pint or $1.99 a half pint. Tested, Approved and Recommended by RCM.

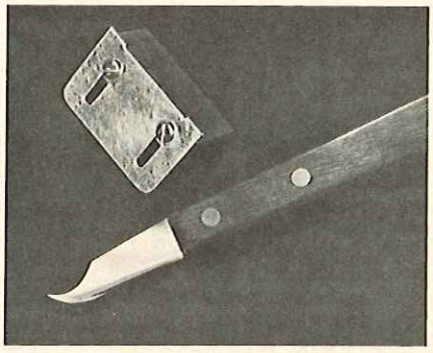


The Murphy Muffler, produced by the Murphy Muffler Company, Inc., 5312 E. Beverly Blvd., Los Angeles, California 90022, will change that high pitched whine of your engine into a snarl of power with instant "quiet" performance. Designed by the use of adapter plates for any size and make engine currently in use, the Murphy Muffler can be simply slipped on your

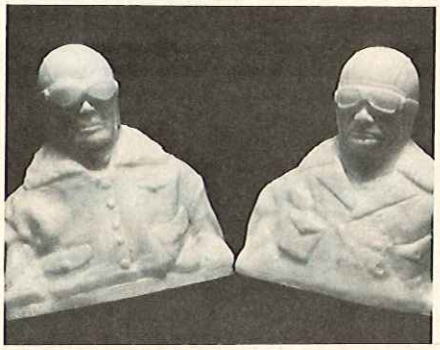
engine for quiet operation without loss of power. The Murphy Muffler reduces sound by 75% at 50' by actual California Highway Patrol Engineering Department Tests using a K & B .40 RR engine for their test report. Instant installation is possible by a coil spring that holds the Murphy Muffler firmly in place and yet will allow the muffler to separate from the engine under high stress conditions. This method of attachment eliminates danger to the engine. Your engine is easy to prime when you use the Murphy Muffler since you simply pull the muffler down against the spring tension and prime and, when released, your muffler will automatically snap back into position. The Murphy Muffler is so light, your model will hardly know it's there, but your neighbors will – changing flying from "call the cops," to "fun to watch." An infinitely variable exhaust orifice provides just the right amount of back pressure for best idling characteristics. Top end power is still superior to any other muffling device. It is not necessary to buy a muffler for each different engine you own. Murphy Muffler has adapters available to make each Murphy Muffler adapt to many types of engines. A specially formulated silicon rubber sleeve used on the Murphy Muffler has been specially formulated by Dow Corning and is unaffected by heat, fuel or weather. The Murphy Muffler is available at your local dealer and has been thoroughly Tested and is Approved and Recommended by RCM.

* * * *

Metalphoto is an item being produced by Kurt Savegnago, 363 Roosevelt Road, Glen Ellyn, Illinois. These Metalphotos are metal nameplates on which Kurt Savegnago can reproduce your artwork or hand drawings such as club name, name, club emblem, frequency numbers, AMA numbers, etc. Available in thicknesses of .008", .005", or .003", Metalphoto can reproduce black letters on silver or matte background; silver or matte letters on black background; black letters on a colored background; black background with colored letters; colored letters on a silver or matte background; or silver or matte letters on a colored background. If you or your club are interested in these nameplates, send a rough drawing of the plate that you want made stating how many plates, what colors are to be used, the thickness of the plates, the regular or permanent type adhesive, and the size of the plates. Metalphoto will then quote a price and, if acceptable, they will reproduce your art work on an adhesive backed metal plate. Tested, Approved and Recommended by RCM.



"Hinge It" from Tatone Products, 4719 Mission Street, San Francisco, California 94122, is priced at $2.95 and makes cutting accurate and clean slots for hinges a snap! The guide is adjustable, and will accurately center hinge slots from 1/16" to 5/8". The grooving knife has been designed to follow the guide, not the wood grain. Once the groove has been positioned, the hook side of the blade is used to remove the wood from the slot, leaving a fitted opening for the hinge. No more bulged surfaces from forcing hinges into a narrow slot. Tested, Approved and Recommended by RCM.



New from VK Model Aircraft, 12072 Main Rd., Akron, N.Y. 14001, is their "Captain" and "Rittmeister" WW I pilots. These "Aces" are scaled 2" = 1', and are perfect for that WW I ship. Molded of light styrofoam, with excellent detail, they are available at $3.50 each, unpainted! Tested, Approved and Recommended by RCM. □

ENGINE CLINIC

from page 12

tight. I next tried a very wide bore tubing but it did not seem to make much difference.

With both the normal bore tubing and the wider bore tubing, the engine performed quite well, but I encountered a new problem and that is the one which prompts this letter. In straight out flight and in maneuvers such as rolls, the engine frequently acted like it was starving out, i.e. it would seem to quit temporarily. This was worse with the wider bore tubing and had not occurred with the very narrow bore tubing.

To complete the story, I should say that I had no trouble in high speed when I used the original O.S. carburetor; I went to the Perry carburetor because I could not get a reliable idle with the original carburetor which was the old type that O.S. has been using for years. The idle with the Perry carburetor was good regardless of the tubing I used, but the idle-adjustment disc had to be adjusted for richer settings as I progressed towards leaner needle valve settings in high.

I think that the explanation for the first problem I had, i.e. the cutting in inverted position, was that with the needle valve opened as wide as it was, the fuel simply poured through and flooded the engine when the plane was inverted. I assume that the reason the needle valve had to be opened so wide was that the Perry carburetor does not have a strong draw even in high, and the narrow tubing simply caused the engine to run too lean. What I do not understand is why, having overcome this difficulty by using a medium bore tubing (Tufline), I am getting this faltering in high which occurs even when the tank is full – I would not be surprised if this happend at the end of the tank run since it happens with many motors and carburetors when there is only a little fuel left in the tank.

Please answer the following questions:

1) Is the Perry carburetor which I have defective? I can get nowhere near the one turn opening suggested.

2) Why am I getting the faltering with what seems to be otherwise an entirely satisfactory adjustment?

3) Is my theory of why the engine quit inverted with the needle valve very wide open correct?

4) What do you suggest to avoid the faltering problem? I am thinking of using a larger tank or raising the present tank up higher so its center line is a lesser distance below the needle valve.

I have not observed any foaming or bubbles in the fuel line when running this engine-tank combination on the ground, so I do not believe that foaming is the problem although I suppose it is possible that there is foaming in the air. Certainly, I did not get

the problem with the O.S. carburetor being used with the identical tank. In fact, the O.S. carburetor worked fine in high speed even with the very narrow bore tubing which caused so much trouble with the Perry.

Very truly yours,
David B. Kirschstein
Chappaqua, N.Y.

Dave, you have gone to a lot of trouble experimenting, changing fuel lines, etc., without ever getting to the source of your problem. First of all you say the center line of your tank is approximately 3/8" below the needle valve. How approximate? An inch or so? You say the engine floods out inverted. This can only be caused by a low tank position which, in turn, becomes a high tank position inverted. Check the position of that tank again. I would be willing to bet it is a lot lower than 3/8". This would also account for the needle having to be open so far. A low tank position means the engine starves for fuel.

As for the Perry carburetor not running one turn open . . . don't be concerned with the number of turns open. This can vary between a half and four turns. Tank position, propeller size, fuel, etc., are all variables that, in turn, affect how far open the needle runs. So don't be concerned with how "open" the needle runs as long as it is not so far open that it falls out, as in your case. I am sure raising your tank will solve all of your problems.

As for this problem occuring with the Perry carburetor and not the stock O.S. – the O.S. carburetor has a fairly small venturi resulting in probably a little more fuel draw ability than the Perry. You should have noticed a slight increase in power with the Perry due to the larger venturi area which is closer to the needs of the engine. With your tank positioned correctly you should have no problems with your Perry.

Dear Clarence:

Okay, another dumb question:

Even the new Tatone manifold won't handily go under the cowl of my PT19. As the Enya .60 runs perfectly under there now, inverted, with a muffler, I feel that it will probably also run perfectly with the manifold, instead of the muffler, even though I don't use the exhaust baffle. So, as I don't use the baffle, I'm wondering if it would be okay to cut the exhaust stack off inboard of the holes formerly used for the baffle, and then fly with the manifold or muffler. I will come up with a stack about 3/8" shorter than originally, and I wonder if this will have any adverse effect on breathing, etc.

By pulling the manifold in this much closer to the cylinder, I'll have plenty of room and will also be able to get at the mounting bolts better. Sure would appreciate your advice.

Sincerely
Daniel deG. Strong
Midland, Texas

Shortening the exhaust will not hurt the performance of the engine in any way as long as you are using the Tatone manifold. When an exhaust baffle itself is used, a longer stack seems to improve the idle, probably because there is less pulsation at the exhaust port. I have also noticed, when using mufflers, that those with longer mani-

folds connecting the muffler to the engine seem to create less of a power loss. However, in your situation it shouldn't make any difference.

Dear Mr. Lee:

I have a few questions and I hope you have some time for me.

First, can you explain how to balance an 11 x 6 prop. I need to know where to sand, cut, to balance with a prop balance.

Also, I understand that the throttle is a log function of movement. Can you explain the best way to connect them to a disc output wheel, on a servo KPS-10.

Yours Truly,
Bob Latham

What is it with the Log function, man — let's not complicate this business anymore than we have to. It is true that a wheel output has more throw through the center of its travel than at the ends but this isn't going to bother the operation of the throttle enough for you to detect any difference. The throttle operation itself is not that linear. With the servo at low speed, and the throttle at idle, connect them up. Then check for high speed. If you need more or less servo travel bend the carburetor throttle arm to increase or decrease its throw. You never want to stall the servo at high speed. This results in extreme battery drain and you suddenly find one side of your battery pack dead (usually after the crash). You have to load the servo slightly at idle so as to have a positive stop and also allow for minute adjustment of the carburetor idle speed. However, it is best to use lighter wire than that used for pushrods. I prefer .045 wire and put a 'Z' bend in the wire to absorb any overtravel.

Balance any wooden propeller by sanding material off of the face of the blade at the tips. Never touch the back of the blade as this determines the pitch of the prop.

Dear Mr. Lee:

I have a Max .50 R/C engine. It runs lean, and the needle valve has very little effect. It quits on me when I hold the plane at a 90° angle. I've moved the insert, or needle valve assembly forward once or twice and it doesn't do anything.

The needle valve in every case is out at least 7 turns or more and almost out of the insert. So what is my problem?

I cannot run this engine rich.

John Rimshans
Boston, Mass.

One or all of three things are happening, John. You have a restriction in your fuel system somewhere — you have an air leak in the fuel system somewhere — your tank is too low or too far from the engine. Get the tank as close to the engine as you can with the center line even to 3/8" below the needle valve. Check for any foreign matter in the spray bar and gas lines and no kinks or burrs on the ends of tubing, etc. If you are using a filter be sure it does not leak. Test it under pressure. If you are using one of the sintered bronze tank filters, get rid of it. These load up with varnish, sediment, etc., after a while and no longer pass fuel. Also check the head and back cover screws on the engine for tightness. Follow these things through and you should find your problem. □

FEEDBACK

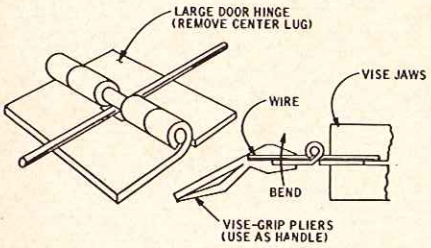
from page 8

This year there will be 3 classes – A, B, and C, and a Pylon race for those who'd like to race their Old Timers which have flown in one of the 3 classes. This is to prevent special models being built just for the Pylon event.

A minimum of rules will be in effect, including one that states all models must retain their original outline although beefing up is recommended for durability. Engine runs will be limited to 20 seconds and models must ROG. There will be no limit on control functions since rudder only to full house proportional may be used. Planes must weigh 12 oz. for each .10 cubic inch displacement of engine. As an example, a plane with a .40 engine must weigh a minimum of 48 oz. or 3 lbs. The maximum time will be decided at the meet by the Contest Director. Thirty trophies will be awarded plus 55 merchandise awards. Entry fee is only $6.00 for the two days plus $1.00 for each additional class entered. One entry class is included in the $6.00 initial fee. For additional information contact Everett Woodman, 389 Floral Lane, Saddlebrook, New Jersey 07662.

Wire Bending Made Easy

A large hinge with one section removed can be used to bend heavy piano wire such as 5/32" and 3/16". The bend produced is very clean with no deformation beyond the bend radius. Try this idea from the Chicago Scalemasters Newsletter – it works!



More On Hinging

Here is an idea from Gary Acord writing in the Ventura County Comet, "Comets Tale." Gary uses small pieces of cardboard in place of hinges in the hinge slots to hold the control surfaces rigid during spraying but about ¼" away from the model. The paint then does not collect in the hinge slots, and the surfaces are easy to remove for sanding between coats. After painting, the hinges are reinstalled permanently with epoxy.

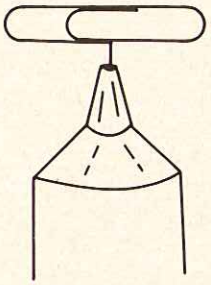
Thinning Epoxy

Did you know that heating is the best way to thin epoxy? According to the makers of Hobbypoxy, heating your epoxy mixture by placing its container in a pan of hot water, is a far superior method of thinning it for paint type application rather than the addition of an excessive amount of thinner. The heating will also contribute to quick curing. The same applies to epoxy paints as well as glues. Heat to about 130 degrees, but be sure not to get any water in

the mixture. This idea was from the Palm Beach Aeronauts "News."

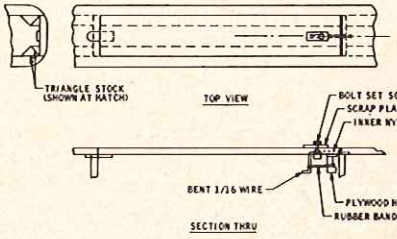
Things 'N Stuff

When the Cement tube oozes out on the bench between squeezings, don't plug it with a nail or pin, but try bending a paper clip as shown in this sketch. This key is larger and easier to use than a pin. This idea reprinted from the Eastern Indiana Radio Control Association Newsletter.



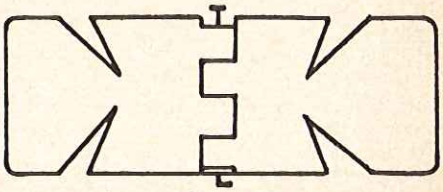
Hatch Lock

Phil Catanzaro, writing in the Greater Pittsburgh Aero R/C Society "Fly Paper," has been working on a different kind of hatch locking arrangement that you may be interested in. It works like this: First of all, instead of a dowel, Phil used a piece of plywood as a tongue. He put the tongue in the front of the hatch and the latch in the back. The latch consists of a piece of 1/16" wire bent as shown in the sketch with a collar on it. In place of the set screw, Phil used a bolt to go through the top. The bolt goes through a piece of scrap plastic that he tapped to fit the bolt. When the latch is in either position you can lock it there by simply tightening down the plastic, making it "rub" on the surface. The pin goes through a piece of inner NyRod that is epoxied to the underside of the hatch. On the underside of the hatch Phil used a rubber band doubled up to keep pressure on the pin in order to keep it extended.



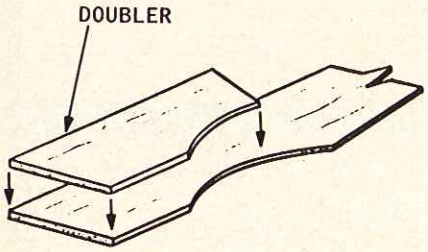
To Pin Or Not To Pin

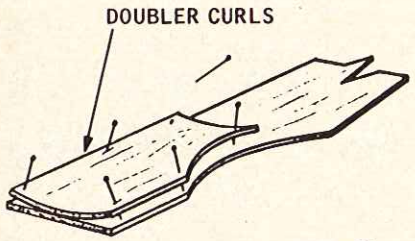
According to the Bucks County R/C Club, Inc., there has been a lot of debate on whether or not to pin hinges. The BCRCC has found that pinning is not necessary if you make four "V" cuts in the hinges and insert with glue. Ambroid is recommended when gluing into wood and the club feels that this is ample since they haven't had a surface pull loose as yet.

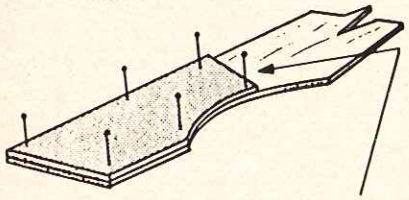


Laminating Doublers

Many of us use Titebond glue a good deal on our models, and a good glue it is, too. But, like any water base glue, it has an inherent tendency to curl up on the wood due to the water expanding on the side on which you put the glue. Here is a tip from the Chicago Scalemasters "Newsletter" to save you some frustration and poor joints: Before spreading the glue on the part, wet the other side with a damp flannel sponge. The expansion is thus equalled and curling is eliminated.







DAMPENED OUTSIDE, DOUBLER STAYS FLAT AND MAKES A GOOD JOINT

So There!

The Northern Virginia Radio Control "Feedback" pointed out that a recent Air Progress Magazine issue had an item about the minimum hours of flight instruction to solo a student. He averages about 12 hours; a good student does it in 8; and one fellow had only 2½ hours before solo. They explained that he was a national champion model aircraft flyer!

CONVERTING TO FLAPERONS

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set-up. And, don't forget to install the hardwood inserts for the flap-effect servo tray hold down screws.

Double check the movement of the sliding aileron servo tray. Make certain that the piano wire sliders do not bind against the inside of the cavity or on the flap effect servo mounting screws as they move back and forth.

As we made a final check of our installation, we noted that the aileron servo wires rubbed against the inside of the cavity as the servo tray moved back and forth. It was necessary to round out the side wall of the wing cavity at this point. We also used plastic tape to line the side and bottom of the cavity in the area of the sliding aileron servo in order to minimize the possibility of long term abrasion of the aileron servo wires.

SETTING UP AND CHECKING THE SERVO LINKAGE

Make certain all of the servo linkage piano wire fits snugly into the servo arm holes. If you get a snug fit you should have no play whatsoever in your ailerons.

Before you rig your flap servo to the sliding aileron tray, be certain your flap servo is in the full forward position (toward the leading edge of the wing). This is your neutral flap position. Slide your aileron servo tray full forward, then back about 1/8" or so. Measure, bend, cut, and install the flap-to-aileron servo tray linkage. (Ref. Diagram No. 3).

Plug the flap servo into one of the auxiliary outputs on your receiver, and try it out. Make certain you have a bit of clearance at either end of the movement of the aileron servo tray. This will insure that you won't run into any binding problems. Note where your auxiliary control is on your transmitter when you have your flaps in the neutral position.

Return the flap servo to the neutral flap position (full up or full down on your transmitter auxiliary control). Rig your aileron linkage for the aileron-servo to the strip-aileron arms as usual.

When you're ready, plug in the servos and check the operation. When you operate the aileron stick on the transmitter, the ailerons should operate as usual. When you operate your auxiliary control (to operate the flaps) you should get from neutral to full-down flaps.

Check to make certain that your ailerons don't jam if they are operated while the flaps are in the full down position. If they do, you can either drill a new hole in the flap servo arm closer to the pivot point, or, shave the bottom side of the leading edge of the ailerons to permit more movement. Or, you could make adjustments in your aileron linkage to decrease the throw of your ailerons – though this is perhaps the least desirable adjustment to make.

GENERAL

In doing some reading about flaps, those who have messed with 'em seem to agree that about 30° down flaps is maximum. But each plane may react somewhat differently to different flap settings. It seems sensible, therefore, to run through a careful check-out of the plane once flaps are added.

My technique is to set the flaps in neutral – so the ailerons are in the position I've been used to flying, and get the plane up high. Then, once the plane is in level flight, add a bit of down flaps. Then throttle back so the plane flies level and fly it around a bit in some figure eights, loops, inverted flight, and so on. Next, add more flaps – while at a safe altitude – and throttle back for level flight. And experiment some more.

And so on, until full-down flaps is achieved. In that way, if the plane shows any tendency to do some unusual things, you can find out about it at a safe altitude and use the flaps accordingly when you're close to the ground. □

WANTED: Dead or Alive

Glitchus splinteratum, commonly known as "glitch." This creature preys upon that segment of the species Homo Sapiens known as the "R/C Nuts," normally found in open fields where grown-ups play with toy airplanes. A "glitch" is extremely dangerous when in full plumage, and the adult male should only be approached by experienced glitch hunters wielding loaded signal strength meters. Its bite produces immediate violent reactions, beginning with a nervous pallor and frantic twitching of the thumbs. This is followed rapidly by hoarse cries of, "I ain't got it!" and splintering, and/or "thudding" noises. At this point, the victim usually lapses into uncontrolled sobbing and may become militant if approached within 5 or 10 minutes after being bitten. The glitch is, as a rule, usually invisible, and any sightings should be immediately reported to the Glitch Control Officer of the R/C Nuts of Broward County of Plantation, Florida. □

FROM THE SHOP

from page 4

11. Three turn spin
12. Optional (any WW II maneuver; Touch & Go, Snap Roll, Figure 8, Victory Roll)
13. Overall realistic appearance of flight
14. Scale speed of aircraft
15. Landing perfection
16. Spot landing

4. MISSION: (Scale judging not required.) The object of this event is to drop a bomb accurately on a target, strafe the "Atlantis" battleship, and finally to land on a carrier deck (spot landing).
The total "Mission" score is based upon accuracy in bombing and landing, and the ability to hit (strafe) the battleship.
The time per flight (attempt) will be limited to three minutes to start the engine, and ten minutes overall.
(a) Bomb Drop:
(1) The bomb may be any non-

hazardous object which satisfies the following requirements: (a) Maximum weight of 2 oz.; (b) Minimum cross-section of 1 in.^{2} (2) Bomb may be released in any manner from an altitude of at least 10 feet. (3) The target will consist of a circle with a diameter of 50 feet. (4) The maximum score is 50 points for dropping the bomb in the circle.

(b) Straffing Run:
(1) The "Atlantis" will be 2 soft balsa flag staffs, 4 feet apart – 10 feet high. (2) A maximum of two passes will be allowed per flight; the flyer must call each attempt. (3) 100 points for breaking both staffs on first pass; 50 points for breaking either staff on first pass; and 25 points for breaking either staff on second pass. (4) Maximum score – 100 points.

(c) Landing On the Carrier Deck (Spot landing – no arresting gear):
(1) Landing area will consist of a 90' x 30' simulated carrier deck. (2) The actual landing spot is defined as that point where, in the opinion of the judges, the aircraft is no longer airborne (last bounce). (3) The score for landing is 50 points for the first third of deck, 25 points for the second third, and 10 points for last third. (4) Two attempts may be made providing the aircraft does not stop during the first attempt (i.e., it must "Touch & Go", or fly by); last attempt only will receive score. (5) Maximum score: 50 points.

Modelers interested in this event should contact Contest Director Chuck Gill, 835 Gilbridge Road, Martinsville, N.J. 08336, or Hank Hall, 921 Newsman's Lane, Somerville, N.J. 08876. Any World War II subject will be accepted with a special prize for the most different aircraft as well as the most realistic Kamikaze.

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We received a letter from Jerry Greaves of Newtown, Connecticut, regarding the new Hot-Melt glue guns. As Jerry points out, they are very useful and a welcome addition to our bag of tricks. But (and this is a terrible word) they should not be used everywhere. These Hot-Melt glue gun adhesives are mixtures of thermoplastics and waxes, a careful compromise between strength, melt temperature, flow, setting time, and even color stability. A claim that they are "strong as epoxy" is misleading. At room temperature they could be – but (that word again) inside a black plastic-covered airplane in the desert summer sun, they are nowhere near that strong! Joints and compression - - - fine, but joints under constant tension - - - be careful!

One must get the joint together very quickly. A 1/32" layer of glue has little strength and this goes for most other glues as well. In addition, the Hot-Melt adhesive is quite heavy. Big globs of stuff don't help and they are hard to remove because they are so rubbery.

Again, as Jerry points out, a fine tool - - - in the right place.

See you at the field. □