

RCMW-FSP FEBRUARY 2015

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INSECT POWERED PLANES



CURTISS P40 WARHAWK AT THE USAF MUSEUM IN DAYTON, OHIO

For the Model Builder and Flyer - February 2015 Issue



Full
Size
Plans



Here's the February issue. Even more new stuff this time !! Pat Tritle has joined us as a regular columnist and the first of his bi-monthly columns appears in this issue. His column, "Talking Small" will cover the same sort of topics that appeared in his Flying Models columns. Take a look and contact Pat for any questions and contributions. Maybe we can get him to offer some of his model designs for publication too.

Also in this issue is an article by Dick Sarpolus that he calls "A Good Wing". All about a versatile way to use stock foam wings to make those quickly built RC models that look good, fly well, and don't cost a fortune. Kind of a neat idea that makes it easy to build those "stand way back - sorta scale" models. They look great in the air.

Giuseppe Fascione, historian for the Vintage RC Society (VRCS) has joined us also as an occasional contributor. His first article, "A Week With Mister Scale", about his recent visit with Dave Platt that included flying a wide variety of Platt's models gives us a lot insight into what it takes to make his world beating scale models.

Bob Aberle, our regular and long time contributor reviews the E-Flite UMX SPACEWALKER RTF model in this issue. Bob will be back with construction articles and new designs down the road.

How about a plane cradle that's easy to build and can be knocked down for portability. Alex Rillos presents his design with photos and dimensions so that you can make it yourself. And now for a trip to your local supplier of plastic plumbing tubing.

And now for a couple of classics by Earl Cayton, a long time modeler and member of the Society of Antique Modelers (SAM). First up is Earl's SLEEKSTER, a U-Control stunt ship originally published in the August 1955 issue of Flying Models magazine. We couldn't find a full size plan of the design so it was enlarged from the magazine.

The second offering by Cayton is the PYLONER, an attractive pylon Free Flight ship details of which appeared in the winter 1946 edition of Bill Winter's PLANBOOK. The full size plan was published by the Aircraft Plan Company. It's a class A model that shows a Bantam 19 ignition engine so is OK for SAM competition.

Gene Wallock designed the Nordic A-1 glider as his answer to the highly "rectangular" Nordics popular in the 1960's. It was kitted by Ace Products of Pasadena and Gene reports that it was a good flyer. Bungee launched gliders are becoming popular and scaled to the 36 inch wingspan that is used for that event it should make a good showing.

Insect Powered Planes. What, you say, that's impossible !! Well, guess again because here's how to do it along with details and plans. Also included are some notes by your editor describing his own youthful indiscretions along line that happened many years ago.

Tune in again next month for more of the same.

Roland Friestad, Editor

We Get Letters and Misc Other Stuff



Just a note about printing out full size plans.

I copied the November 2014 issue to a flash drive and took it to my local Staples Store. I asked them to print page 13. Shortly I had the full size plans for the Thermix-13 PF. All for \$3.69. For me, this was easier than trying to figure out how to TILE from PDF files.

I'm a new subscriber, and have been a builder since the '40s. I enjoy your magazine!

Bruce Harrington

PS: photo is of the TA 152-H I converted from Al Lidbergs 40" rubber powered plans. RC electric 3 channel. Too fast!

About Dick Sarpolus

Dick has been active in model aviation for many years. His early R/C gear had tubes, mechanical relays, and high voltage batteries. The large heavy transmitter sat on the ground with a 9' antenna, controlled by a push button on the end of a cord. He flew with single channel, galloping ghost, reeds, and finally proportional radios.

When flying in competition, he accumulated more than 150 trophies in almost every R/C category. In 1969 he began writing for the airplane magazines; since then, he has had published more than 500 articles and two books. Included in his writings are approximately 200 airplane design/construction articles. His projects are aimed at the average modeler/sport flier, and feature straightforward construction techniques.

In 1985 he was inducted into the AMA's Model Aviation Hall of Fame.

He considers building an important part of the overall model airplane experience, but says if you want to only fly, or only build, the main thing is to have fun with this hobby!

The Numbers in the Corner

The two numbers in the upper right corner of our plans represent the dimensions to the OUTSIDE of the border when the plan is printed at full scale.

How to scale plans by wingspan or wing area was discussed in the December 2014 issue.

Attaboys and Brickbats

We want to hear from our readers, especially if you have photos, stories and hints on building and flying that can help other modelers just getting started. Don't keep it a secret. Remember all the builders who helped you when you were learning and pass it on. That's what we're trying to do with RCMW-FSP. How about giving us a hand.

Suggestions and complaints are always welcome too, so send us an email to ---
cardinal.eng@grics.net

Good Links - Bad Links

One of the big advantages of an online magazine is that active links can be included so that readers do not have to enter complicated lists of characters manually, but just hover over the link until it appears in the little box, then click on the box to go to that location, or start an email to the address given. Quick and easy!

One of the minor inconveniences of using active links is due to the very fluid nature of the internet. All links are checked out for each issue but links may change or even disappear into a bypass on Al Gore's information superhighway (little humour there).

We check all links in each issue but cannot be responsible for changes over which we have no control. If you find a link that doesn't work properly it really isn't our fault, honest. If you find the correct link that replaces a bad one we'd like to know.

E-FLITE UMX SPACEWALKER

Product Review

by

Bob Aberle

BACKGROUND

In the October 2014 issue of RCMW-FSP I ran a detailed report on the recent NEAT Fair electric fly-in, held every year upstate New York.

www.neatfair.org

In that report I mentioned two micro products that caught my attention and really impressed me very much. As it turned out both aircraft were offered by Horizon Hobby, under their E-Flite label.

The first was their UMX RADIANT BNF which is an electric powered RC micro size RTF sailplane.

The other plane was the E-Flite UMX SPACEWALKER RTF model. Both proved excellent flyers both indoors and outdoors and are offered at very reasonable prices.

The UMX RADIANT review has already appeared in the December 2014 issue of RCMW. The subject of this review is the UMX SPACEWALKER.

You will note that the review format is identical for both planes. But the numbers are, of course, different.



SPACEWALKER at the left, RADIANT at the right



Author, Bob Aberle, holding the little UMX SPACEWALKER which weighs just 0.8 ounces with motor, battery and RC system.



Here are overall shots of the SPACEWALKER. It has a small 16.5 inch wing span. The DX-7 transmitter gives you an idea of the small size.

ABOUT THE PLANE

This micro version of the SPACEWALKER was derived from the full size aircraft developed by Warner Aircraft Inc. of Seminole, FL. If you would like to pursue the background info of this aircraft I can refer you to the company website at the following link

www.warnerair.com

The plane being reviewed is truly a ready-to-fly (RTF) model aircraft. The plane comes completely assembled ready to fly. You charge the single cell battery, with the supplied charger, bind the aircraft receiver to your transmitter and go flying. Even the wing is attached to the fuselage.



Here's a view of the kit box containing everything except the transmitter.



This photo shows the neat packaging of the ready-to-fly UMX RADIANT and the next picture shows the front of the very comprehensive instruction manual.



WHAT YOU GET !

The radio system consists of a Spektrum AR type brick with two linear servos and a built-in brushed motor ESC. The radio, control linkages and the motor are all factory installed.

A single cell 70 mAh Li-Poly battery is supplied along with a simple little charger that is powered by four AA alkaline batteries that are also supplied. Other chargers are available from Horizon Hobby that can work off DC as well as AC power sources. Extra batteries can be purchased at modest cost.



Here's the charger along with the supplied four AA batteries and the single cell battery for the aircraft. The next photo shows the aircraft battery plugged into the charger.



Unlike the RADIANT, the SPACEWALKER does not include the AS3X self stabilizing technology. Quite honestly, I didn't feel that the SPACEWALKER needs that self stabilizer.

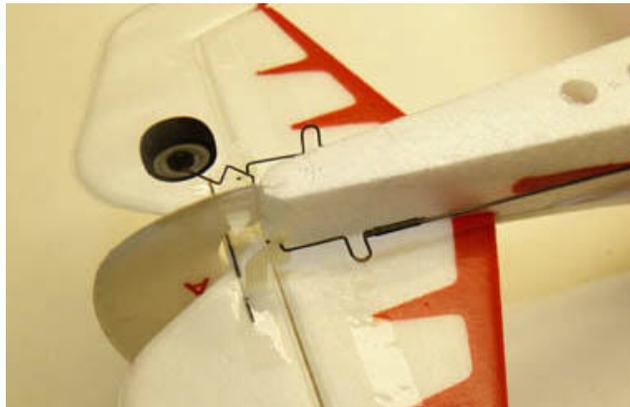
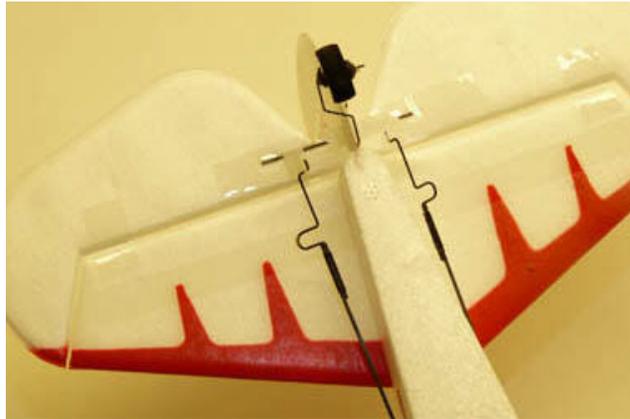
The motor is a 6 mm, brushed variety with a gear box. You won't see the motor or RC system in any of these photos because they are installed at the factory and are internal to the aircraft structure.



The battery fits into an opening on the bottom of the fuselage, roughly at the center of gravity location. The battery plugs into a cable that exits the bottom of the fuselage.



A Velcro type tape holds the battery in position. Changing to a freshly charged battery takes only seconds.



The controls come already hooked up at the factory. They consist of carbon fiber rods and tiny control horns. Mechanical adjustments can easily be made. Or you can use your transmitter travel adjustments.

WHAT YOU NEED!

The only thing you will need to buy to make this plane fly is a DSM-2 or DSMX compatible transmitter. Binding the transmitter to the Radian receiver is a simple process and is covered thoroughly in the instruction manual.

You can also purchase the SPACEWALKER with an inexpensive transmitter that comes factory bound to the receiver inside the plane.



This is the underside of the SPACEWALKER.



The SPACEWALKER ready to fly, just charge the battery.

CG & CONTROL THROW COMMENTS

The factory established CG location worked out perfectly at 18 mm (0.70 inch) back from the wing leading edge.

Control throw was as established in the factory with the elevator 5/16 inch either side of the neutral position and the rudder at 1/4 inch either side. No adjustments were made. Neither dual rate or expo rate was employed.

FLYING

Flying the UMx SPACEWALKER proved the very best. It is as good as the RADIANT sailplane, but in a different way. The RADIANT must be hand launched since it is a sailplane without a landing gear.

On the other hand the SPACEWALKER not only has a landing gear but a steerable tail wheel as well. I found that taking off from a smooth gymnasium floor, was as easy as it can be.

In flight the SPACEWALKER can be slowed down to almost a standstill and still not stall. I flew my SPACEWALKER both indoors as well as outdoors in 5 to 7 mph winds.



The 70 mAh battery will provide about 8 minute run time. You could easily go to a 150 mAh battery and double that time. The battery is close to the CG so the extra weight should not be a problem. This has to be one of the finest E-Flite UMx planes that I have flown to date.





SPECIFICATIONS

Model:

E-Flite UMX SPACEWALKER (EFLU2700)

A micro size electric powered ready to fly aircraft

Wingspan: 16.5 inches

Wing Area: 45 square inches

Length: 11.6 inches

Weight: 0.8 ounce (22.7 grams) (with a single 70 mAh battery)

Wing Loading 2.6 oz/sq.ft.

RC GEAR USED:

Horizon/Spektrum DX-7 transmitter, 2.4 GHz spread spectrum, Spektrum AR Brick which includes two linear action micro servos and a brushed motor ESC, all installed in the model.

POWER SYSTEM USED:

Horizon E-Flite 6 mm, geared brushed motor, prop 3 7/8 inch diameter and a single cell 70 mAh Li-Poly battery.

POWER SYSTEM PARAMETERS:

Prop: 3 7/8 inches diameter

Motor current: 0.5 amps

Voltage: 3.5 volts (under load)

Power Input: 1.75 watts

Battery Loading: 7C

Power Loading: 35 watts/pound

Flight Time: 8 minutes with the 70 mAh battery cell.

SOURCE REFERENCE

BP Hobbies

Horizon Hobby (Spektrum DX7 transmitter and E-Flite Spacewalker, RTF kit number EFLU 2700.

www.horizonhobby.com/

SUMMARY

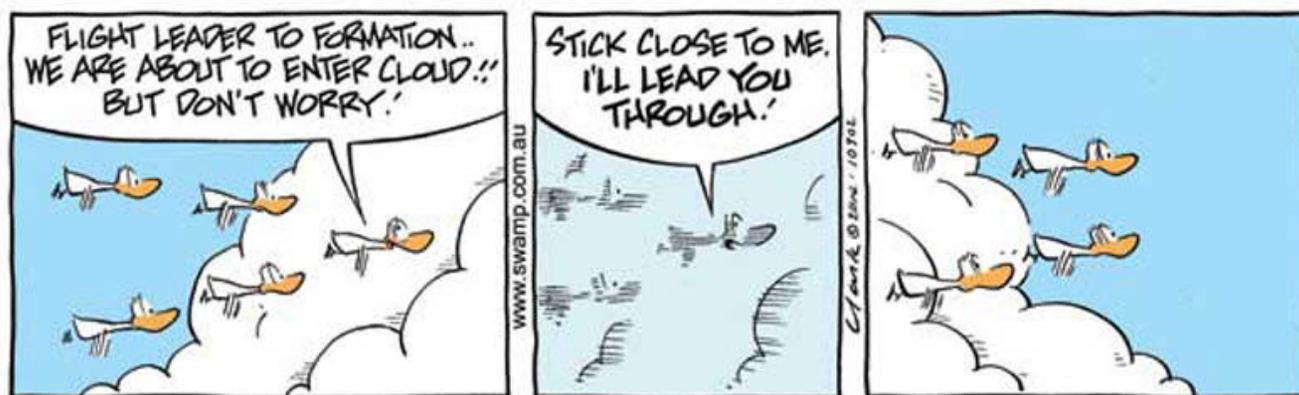
As I said last month in my RADIANT review – Impressive – YES! At a very affordable price! Buy it – charge it – and fly it!

I would suggest you learn first with the RADIANT sailplane and then move on to the SPACEWALKER which will allow you to do some of the basic aerobatic maneuvers.

When you are done with your RADIANT and SPACEWALKER, think of the other planes you could build using this power and RC system.

Write to me with your thoughts and ideas.

Bob Aberle, AMA 215
baberle@optonline.net

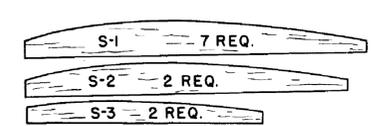
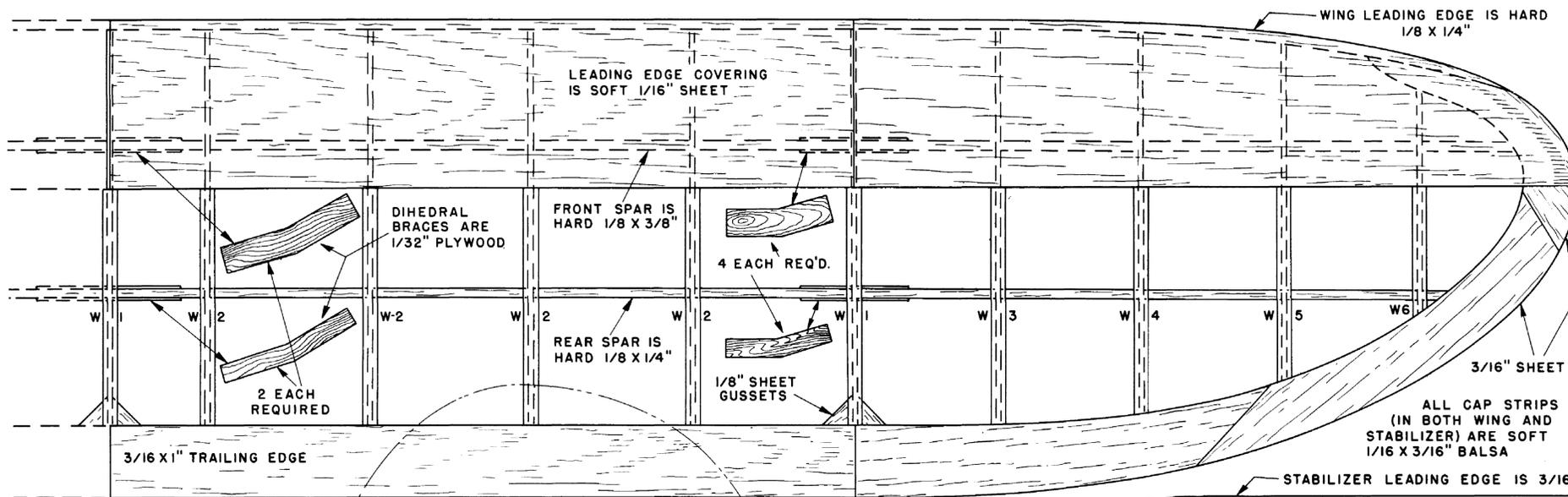
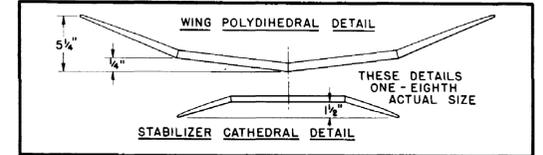


carl cayton's PLAN G-1 "PYLONER"

DETAILED IN WINTER, '46 EDITION OF BILL WINTER'S PLANBOOK
THIS FULL SIZE PLAN IS DISTRIBUTED BY AIRCRAFT PLAN CO.
P.O. BOX 143, FRANKLIN SQ., N.Y.

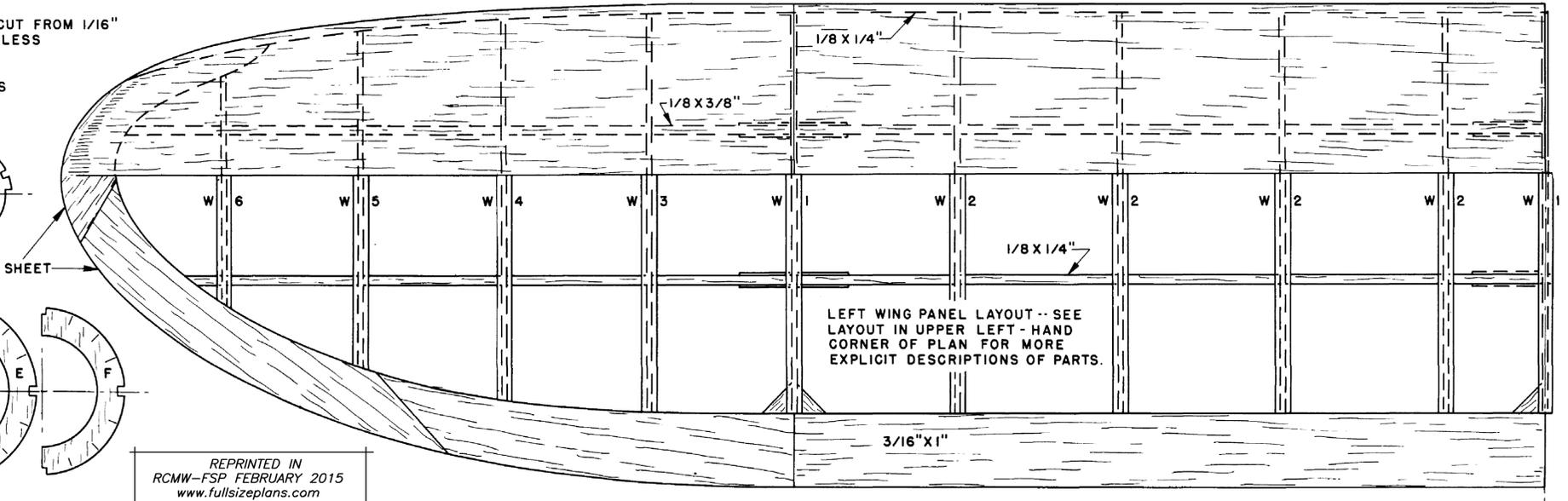
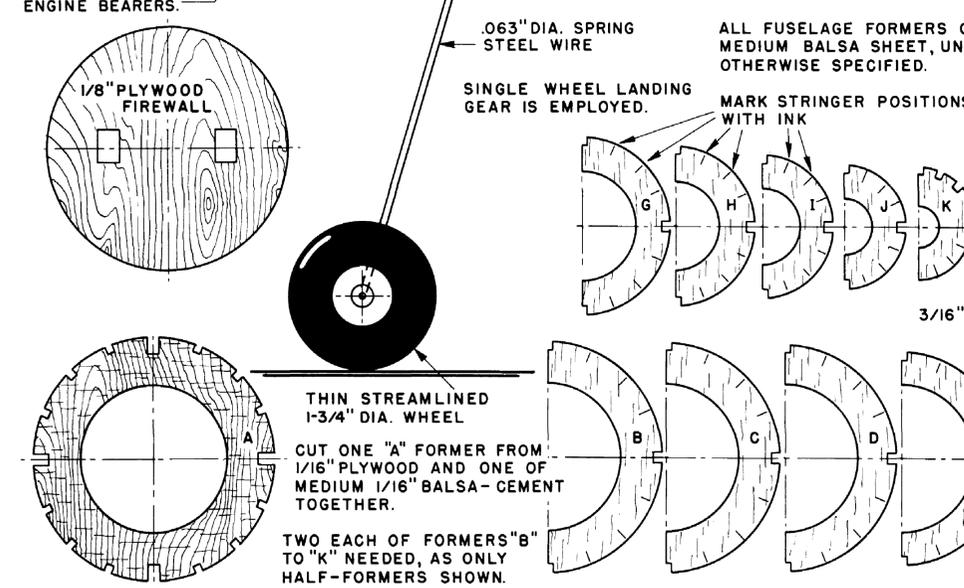
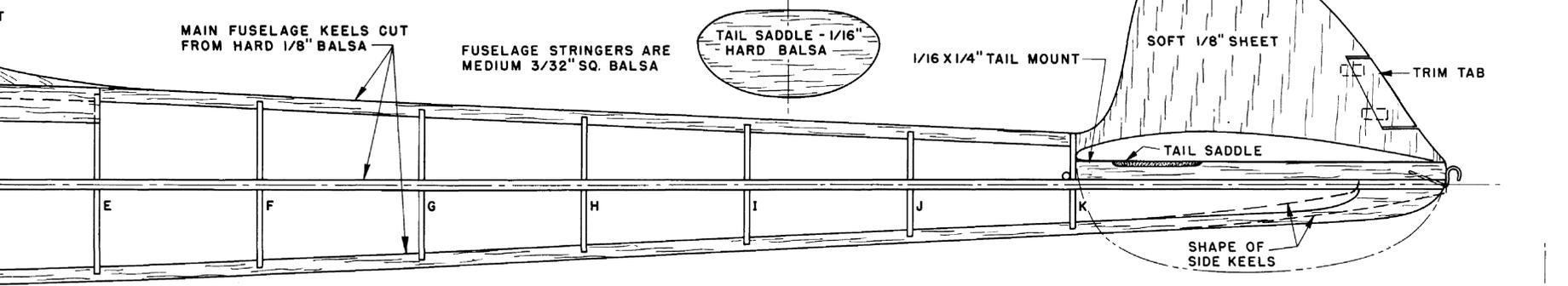
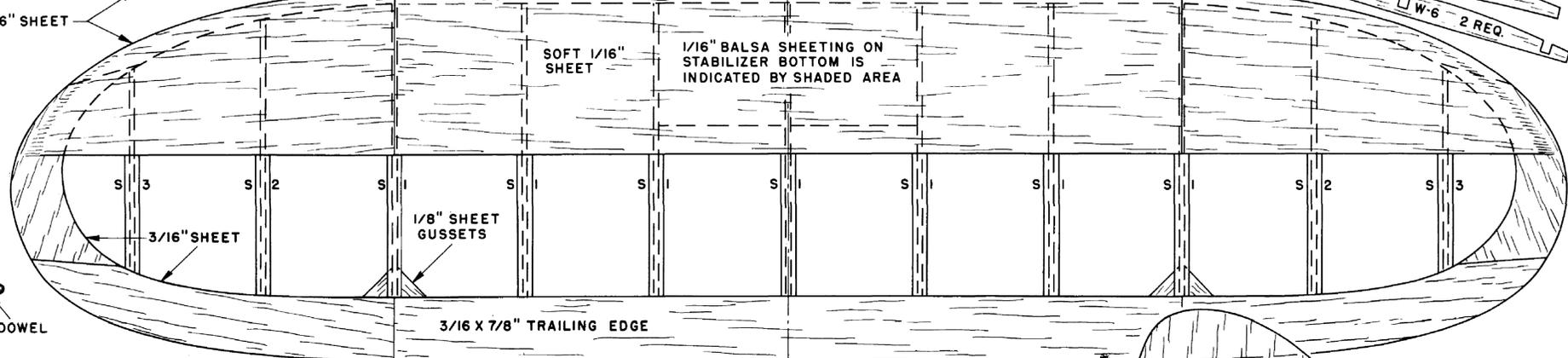
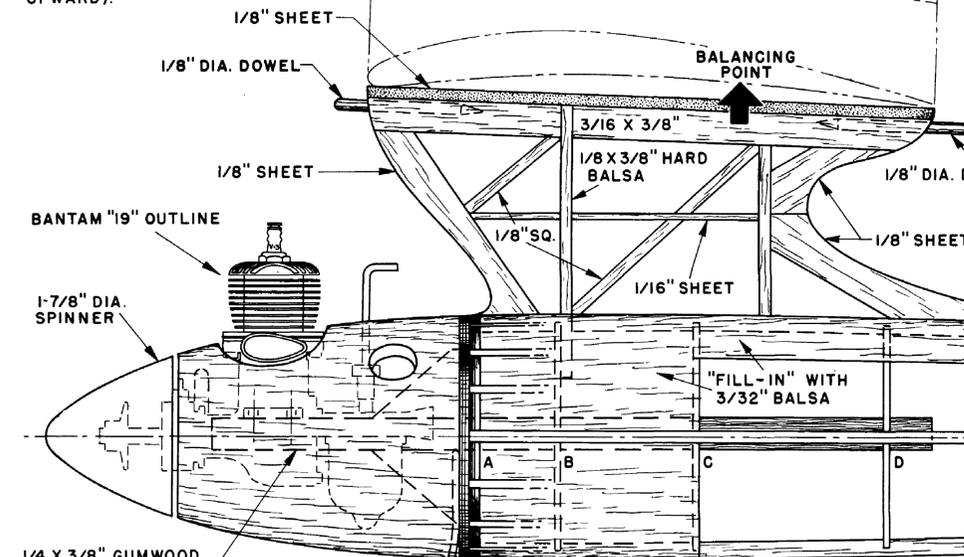
FREE - FLIGHT HIGH PERFORMANCE CLASS "A" CONTEST GAS MODEL

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PYLON IS COVERED WITH 1/16" SHEET WITH THE GRAIN AT 45° (DIAGONAL - FORWARD AND UPWARD).

1/4" INCIDENCE IN WING. STABILIZER SET AT 0° INCIDENCE. NO OFFSET OF ENGINE.
ALL WING AND STABILIZER RIBS CUT FROM MEDIUM-SOFT 1/16" SHEET BALSA.
PORTION OF FUSELAGE FORWARD OF FORMER "A" IS REMOVABLE FOR ACCESS TO IGNITION SYSTEM, WHICH IS MOUNTED ON THE ENGINE BEARERS.



LEFT WING PANEL LAYOUT -- SEE LAYOUT IN UPPER LEFT - HAND CORNER OF PLAN FOR MORE EXPLICIT DESCRIPTIONS OF PARTS.

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www.fullsizeplans.com
CLICK HERE TO GO TO WEBSITE

PLANS BY PAUL PLECAN

Talking Small

by
Pat Tritle

With the loss of Flying Models Magazine and the Tradition of Randy Randolph's column, Small Talk might have drifted off into obscurity.

However, SMALL (Small Model Airplane Lovers League) is still alive and well, and with the introduction of "Talking Small" here in RC Micro World it appears that the 20-odd year tradition of modelers gathering with all kinds of innovative designs and ideas will continue.

I also very much appreciate the opportunity to continue along with the legacy of the organization, and to be able to continue to share the work of modelers who like these small Park Flyer type models.

The whole idea behind SMALL was to fly Free Flight, U-Control and R/C models powered by .25 two stroke or .26 four stroke engines or smaller, electrics of comparable size, and of course, rubber power.

And for those who have gathered in Little Rock, Arkansas for the annual June gathering, the privilege of seeing the kinds of things that will actually fly would boggle even the most creative and inventive minds.

But that's not all that this column will cover. Though we're talking about small Park Flyer models, the goal will be to share a lifetime of knowledge that has been accumulated over the

years by passing on building and flying tips from like minded modelers, as well as to show off your building skills as well.

A little about the Author

Some of you already know who I am from RC Groups and other printed media. But for those who don't, I've been involved in modeling in one form or fashion for going on 58 years. It all started with a Carl Goldberg Cessna 180 when I was 5.

With a little (OK, a Lot of) coaching from my Dad I was able to get the kit built, and in the summer of 1958, my goal was to fly the model all the way across our front lawn. At the time I didn't know the yard was only 25 feet wide, but you have to start somewhere. And somehow, I did reach that goal.

Since then, with the exception of six weeks in Air Force basic Training, modeling has been a non stop endeavor. And during that time, I've enjoyed just about every aspect of modeling there is including plastic scale, free flight, U-Control and R/C.

And it doesn't have to be just airplanes, but also included cars, motorcycles, boats, architectural, or just about anything else that could be assembled, painted, flown, floated or just displayed.

On the print media side of things I had my first Article published in Model Airplane News magazine in 1971 with a free flight design that I had done as a drafting class project in 1970. Then after a bit of a dry spell, the next one came with a 30" Shoestring, also in MAN in the mid 90's.

From there it's been pretty well non-stop with Construction and How-To articles and kit reviews in just about all of the domestic modeling

magazines, including the 7 year run with Small Talk in Flying Models.

After the leaving the Air Force in '76 I spent 17 years in the automotive repair business, and after a 2 year stretch in building UAV's went into modeling full time with a Custom Building business that soon evolved into kit design as well.

Then in the mid 90's I began doing kit design with Dare Distributors, nearly 40 designs in all. Since that time have done a series of R/C airplanes with Dumas as well, and am still actively designing for both. Then in the spare time, I've been working on an on-going series of Short Kits as well as airplane and boat plans that I offer on my own.

After many years working through virtually every facet of fixed wing R/C flying I found my niche in light-weight scale electric Park Flyers, which in form are really just electric free flight airplanes with built in guidance.

The designs include simple 3 channel offerings all the way to 5 channel multi-engine models. Being as my roots are in free flight, but preferring to fly R/C since free flight has become severely limited by urban sprawl and other limiting factors, building these light-weight E-flyers is definitely the best of both worlds.

About the Column

The gist of the column is of course, modeling. The plan is to offer tips on both building and flying, as well as to share the efforts of modelers active in their craft. To do that, we need input from you the readers who would like to also share your efforts, thoughts, and ideas with all of us.

Another thing I used to do was a section called "From the Attic", showing old photos from the early years in modeling.



The Hinge Slotting Tool is simple to make from stock brass sizes and wood dowel, and can be tailored to fit any specific need.

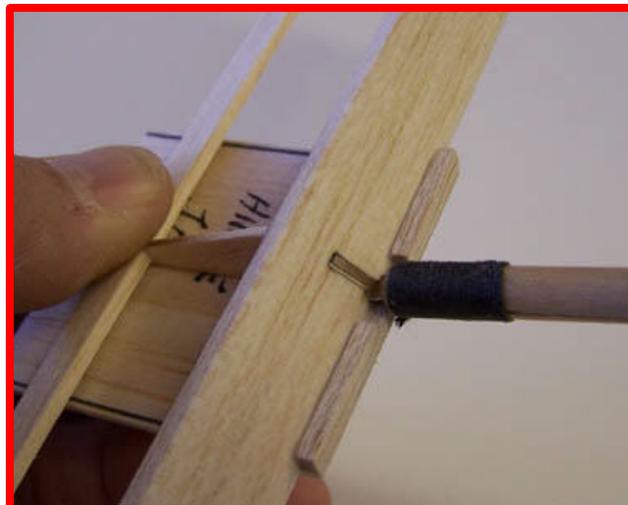
So to kick it all off, I'll begin with a simple tool that I made to cut accurate hinge notches into the smaller, more delicate frames we're working with. The cutting tool was made up from .015 x 1/4-inch brass strap sharpened on one end.

A slot was cut into the 1/4-inch dowel handle with the band saw, the blade glued into the handle and then wrapped with thread to prevent it from twisting out.

The Hinge Jig is made up from scrap balsa and notched to the depth desired for the hinge. When laid over the control surface the tool is laid against the jig and pressed into the wood to form the notch.



A simple guide plate made from scrap balsa is used to insure the hinge slots are cut in the proper location to insure a good clean alignment.



Using the Hinge Tool takes all the guess work out of slotting the control surface to fit its mating surface properly, and makes the finished fit far more uniform than the old "free hand" methods used in the past.

Using the slotting tool is a much safer bet than using a hobby knife, which more often than not required Band-Aids to complete the task.



The spirit of St. Louis was built by the author many years ago from the now very collectable Carl Goldberg kit. It's clear to see that there was much to be learned in the art of fit and finish.

And with the evolution of modeling and the process of developing the required skills, looking at the contrast between "then" and "now" is always fun. The Spirit of St. Louis is one of my very early builds, so early in fact that I'm pretty sure that paint and sand paper hadn't been invented yet.



The 54" span Aeronca Chief is typical of recent Park Flyer designs using modern equipment. Power is a brushless motor with micro servos weighing 7 grams each, and a 1300 mah Lipoly battery that will fly the 15 oz. model for nearly 20 minutes.

The Aeronca Chief is a typical Park Flyer design, well within the realm of my current design style that has been evolving over the course of the past 40-odd years. But even after all the years, hundreds of designs done and models built, there is still much to be learned. And that's where you, the readers come in. Show us your stuff, ask questions, but above all, send pictures, offer suggestions, and ask questions. I've heard some dumb answers in my time, but never a dumb

question, so come on in and join the party. Drop a line and let's get the ball rolling. It's always great fun sharing things modeling with dedicated and creative people.

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Why I Build and Fly Model Airplanes *by Karl Gies*

What endures in this hobby of building model airplanes are the feelings about your work and creations. You would not trade your models for anybody's, not even the best models ever made because they were made by someone else.

I remember the late Joe Macay entering an old time rubber stick model with a one bladed folder in the concours d'elegance at Muskogee. He showed it to me and as I looked at it he read my thoughts.

Joe was not a pretty builder but a person I will never forget. Joe let it all hang out and was a totally honest person. Joe said to me "I know that it will not win but to me it is the most beautiful model in the world because I gave it my all and I am entering it for myself."

Later on he flew it for me. It was a great performer and a Jonathan Livingston Seagull moment for both of us. As we struggled to get it out of a downwind tree Joe said "Isn't this just great."

Being a builder of intermediate skills in all respects I can stare at a model that I have built over and over. This would never happen with a model that I did not build. I will admire another's model analytically trying to learn from it and be motivated by the craftsmanship. But it will never be mine at rest or in the air and my spirit will never soar with it.

PLANE CRADLE

by
Alex Rillos

An inexpensive and easy to build accessory tool for holding your plane fuselages during construction or servicing at home, in your car or in the field.

I got the basic idea from Crescent City R/C Club newsletter in New Orleans, and I would like to share it.

Those cradles are always close to me in my workshop or when I take my planes to the club.

You will find the PVC parts at your home improvement store like Home Depot, Lowes, or Ace Hardware.

Pic. 1 – Parts with pipes already cut to length.

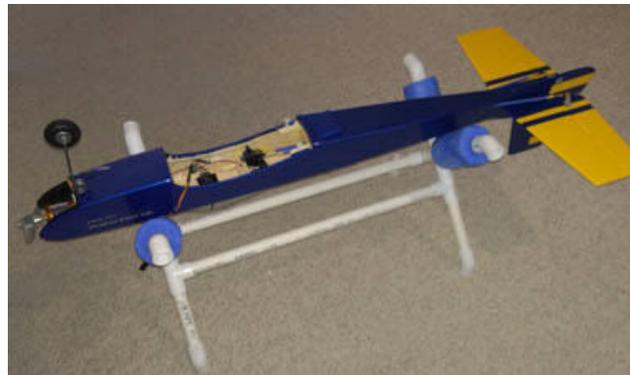
Pic. 2 – Follow the plan to cut the pipes to length and just slide them into the pipe fittings. No glue is necessary.

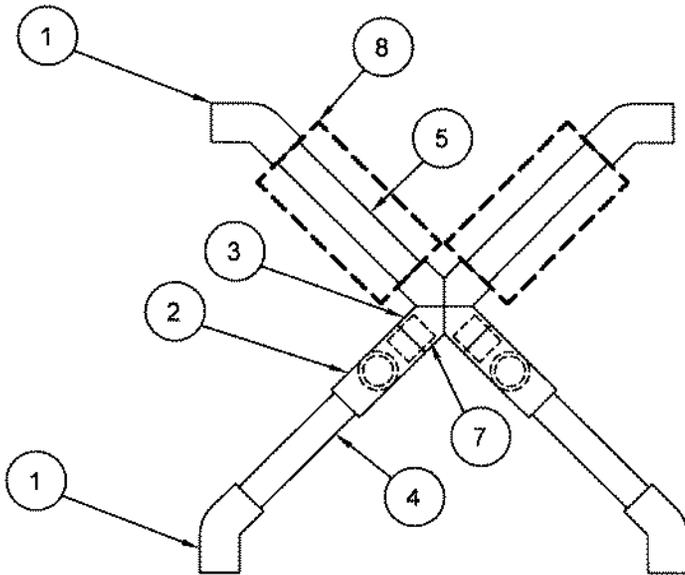
Pic. 3 – Cradle will be handy for servicing model at home, or in the field.

Pic. 4 – The same cradle can be built with 28” long pipes to hold larger airplanes.

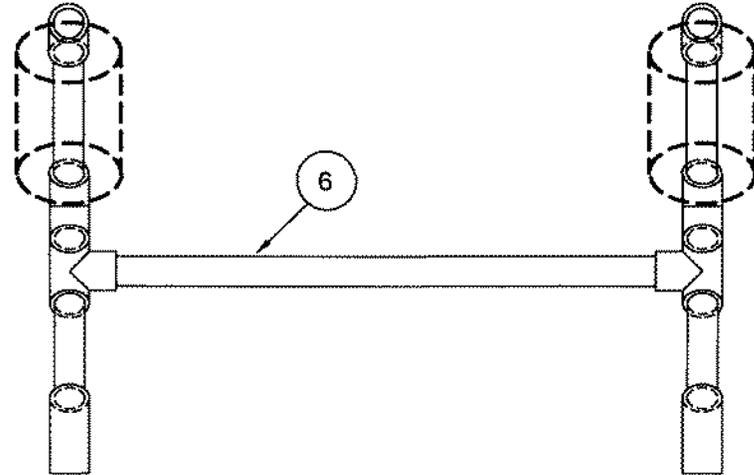
I will be glad to answer any questions.

Alex Rillos
arillos@kc.rr.com





FRONT VIEW



SIDE VIEW

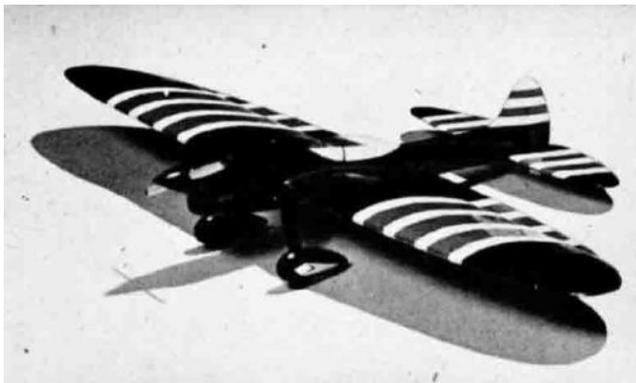
BILL OF MATERIALS

- 1 1/2" PVC 45 DEGREE ELBOW - 8x
- 2 1/2" PVC TEE - 4x
- 3 1/2" PVC CROSS - 2x
- 4 1/2" PVC TUBE - 5" LONG - 4x
- 5 1/2" PVC TUBE - 6" LONG - 4x
- 6 1/2" PVC TUBE - 18" LONG - 2x (28" LONG FOR LARGE AIRPLANES)
- 7 1/2" PVC TUBE - 1 1/2" LONG - 4x
- 8 2 1/2" DIA. POOL NOODLE - 4 1/2" LONG - 4x

PLANE CRADLE
 CAD DRAWING BY ALEX RILLOS
 NOT TO SCALE

SLEEKSTER

by Earl Cayton



"Sleekster" is an advanced stunt model, designed to perform with the best of them at contests, and yet appeal to builders who take pride in the appearance of their planes. The design and finish of the "Sleekster" is by the writer, the construction by Don Bolger.

Large area, thick airfoil, and just the right amount of flap area gives the "Sleekster" the ability to perform tight maneuvers with ease and smoothness. Yet, the design is clean enough so that ample speed is maintained with .29 to .35 displacement engines.

Ready to start construction ?

First, get a piece of wrapping paper and enlarge the quarter-scale plans to full size. **(Editor's note - The plan in this issue of RC-MW-FSP has been enlarged to full size)** This really isn't very hard, even without mechanical drawing experience.

All ribs are shown full size. To get the complete templates for the ribs and for bulkheads #1 through #5, the "fold and trace" method is used: Fold some tracing paper and place the fold on the center-line on the plan. Then, trace the outline of the ribs, cut out the traced outline, and unfold the paper.

Fuselage

First, lay out two sides, using 3/16" square hard balsa. Fill in the sides with 3/16" sheet balsa, to Former #3. Then, connect the sides together with 3/16" square crosspieces, cement all bulkheads into position, and add the planking.

Five 1/4" square stringers are used on the turtleback and two 3/16" stringers fair the bottom of the fuselage.

Cut the team-racer type gear from 24-ST aluminum, and bolt it to the 1/4" plywood anchor. Both the gear anchor and the 1/4" x 1/4" x 6" maple engine mounts are fixed in place with Weld-wood glue or fuel-proof cement.

The bottom of the cowling is carved and hollowed from a 2-3/4" x 2-3/4" x 2-1/4" balsa block. The top of the cowl is carved from a 1-1/8" x 2-1/4" x 7" block. Since the cowl top must be taken off for refueling, it is keyed with little blocks or dowels, and held in place with a small bolt.

Solder the nut to 1/32" brass shim stock, bolted to the back of the engine. The cowl is faired into a 2" aluminum or plastic spinner a la team racing.

The plastic canopy is cemented on top after covering. Rubber tired wheels are attached to the gear, with 6-40 bolts serving as axles. Use

two 6-40 nuts as spacers between the aluminum gear and the wheels, so that the wheel pants can be slipped over the wheels.

The wheel pants are optional and can be removed and replaced with ease. Two 2-56 bolts through the gear hold the wheel pants in place. Solder the nuts to brass shim stock, and hold the shim stock in place with cement and silk.

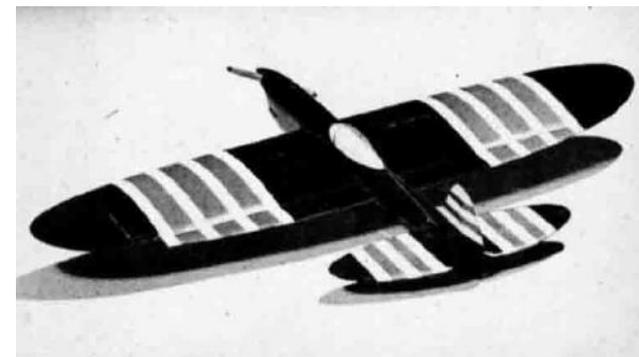
The wheel pants look very sharp for display, and work fine when flying from a smooth field. However, they should be removed when taking off from rough, grassy fields.

TAIL

The stab is cut from 3/16" medium quarter-grain stock. Hinges are formed from 3/32" O.D. tubing and 1/32" piano wire, which is held in place with cloth.

The Veco control-horn is fastened on the outside, for convenient adjustment, to the pushrod. Pushrods are made from 1/16" piano wire. Double the wire where it runs inside the fuselage, for stiffness.

The rudder is built up from 3/16" square and 3/16" sheet balsa. Don't forget the 1" rudder-offset adjustment—it's very important!



WING

First, cut the ribs from 3/32" sheet. For strength, do not hollow the ribs, except for leads and spars. Cement the ribs to the 3/16" x 3/4" center spar and pin them into place. Then, cement the 3/8" x 3/4" trailing edge and the 1/4" sheet tips into place. The hard 1/4" square leading edge and 3/16" hard spars are attached next.

The flaps are cut from 3/16" quarter-grained balsa, and are hinged the same as the stab. Bolt a large Veco or similar bellcrank to the 1/8" plywood floor. Then, attach the plywood floor to the center ribs and the main spar, using balsa fillets and lots of cement.

The center-section and the tips are planked with 1/16" sheet. Build a 2-ounce lead sinker into the outside wing tip, to keep the model tight on the control lines.

One pushrod connects the inside bellcrank hole to the outside hole on the flap-control horn. The other pushrod connects the outside stab control-horn hole to the outside bellcrank hole.

The pushrod is moved to the center or inside stab control horn hole after initial flight-testing, for greater control.

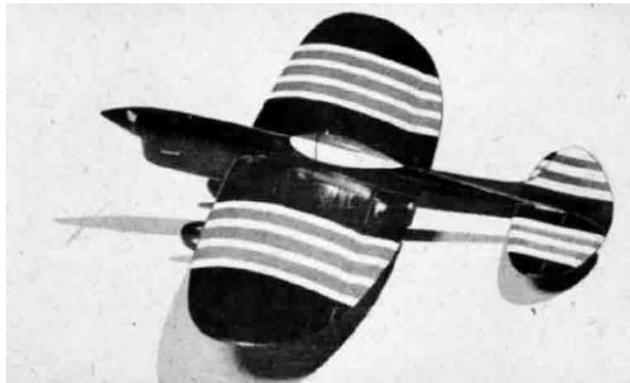
FINISHING & TESTING

The original model was covered with silk for greater durability. For good, but cheap silk, you can purchase silk head scarves at your local dime store at about 65c per square yard, in white or colors.

The original "Sleekster" was painted with six light coats of thin, clear Aero Gloss—then colored dope was painted on with an Aero Gloss spray gun.

A Walker pressure tank was used on the original "Sleekster", but any really dependable tank will do.

Select a good calm day for initial test hops. From there on out, your success with the model will depend on the amount of flying you do in all kinds of weather.



BILL OF MATERIALS

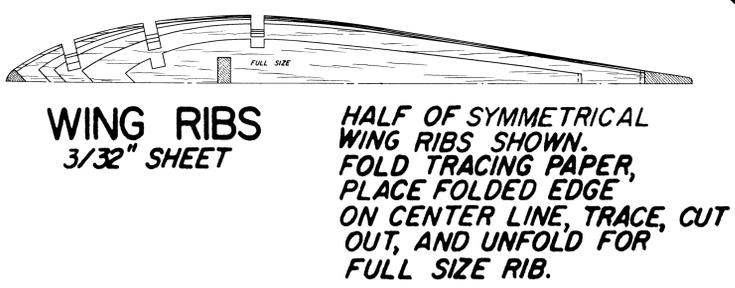
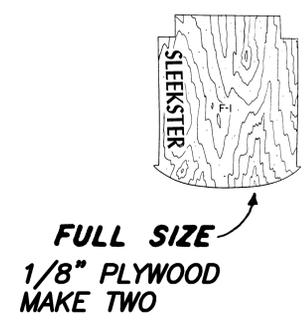
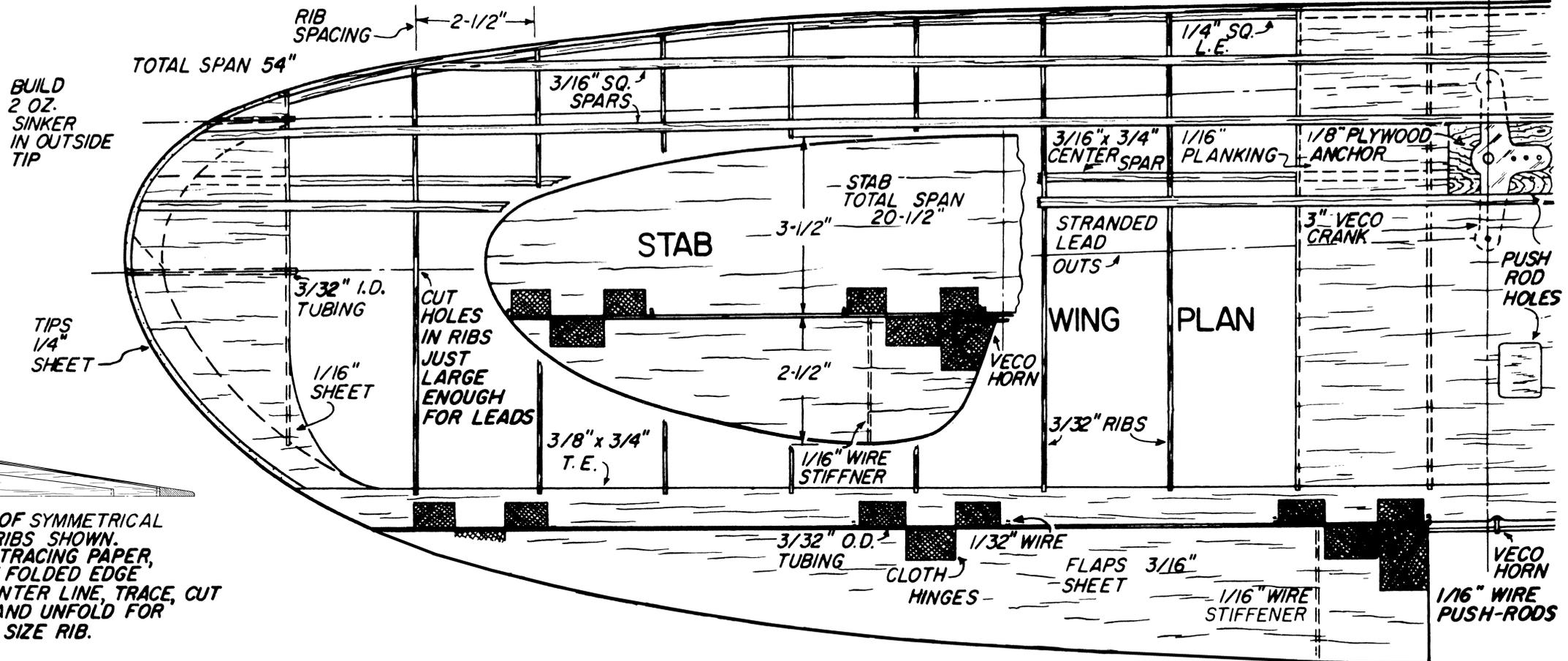
(Balsa unless otherwise specified)

4 - 1/8" x 1/8" x 36" Fuselage stringers
20 - 3/16" x 3/16" x 36" (hard) Wing spars, fuselage longerons, bottom stringers, cross-pieces, rudder

2 - 1/4" x 1/4" X 36" (hard) Wing leading edge
2 - 1/4" x 1/2" x 12" (maple) Engine mount
2 - 3/16" x 3/4" x 36" Wing center spar
2 - 1/16" x 3" x 36" Wing planking
5 - 3/32" x 3" x 36" Wing ribs, fuselage bulkheads
1 - 1/8" x 3" x 36" (fairly soft) Fuselage planking, fill-in
3 - 3/16" x 3" x 36" (quarter-grain) Stabilizer, elevator, wing flaps, wheel pants, fuselage fill-in
1 - 1/4" x 2" x 36" (medium) Wing tips
1/8" plywood; 3" x 3" balsa blocks; 2" spinner; eight 4-40 bolts and nuts; four 2-56 bolts and nuts; three 6-40 bolts and six 6-40 nuts; .062" 24-ST aluminum sheet; one pair 2-1/4" diameter rubber-tired wheels; metal or Walker pressure tank; large Veco or similar bellcrank; two Veco or similar control-horns; two 36" lengths 1/16" piano wire; 1/32" brass shim stock; Berkeley or similar plastic canopy; 3/32" O.D. metal tubing; stranded lead-out wire; 2-1/2 yards of silk or Silkspan; cement; clear fuelproof dope; colored fuelproof dope, if desired; .29 to .35 Fox or similar engine; propeller.

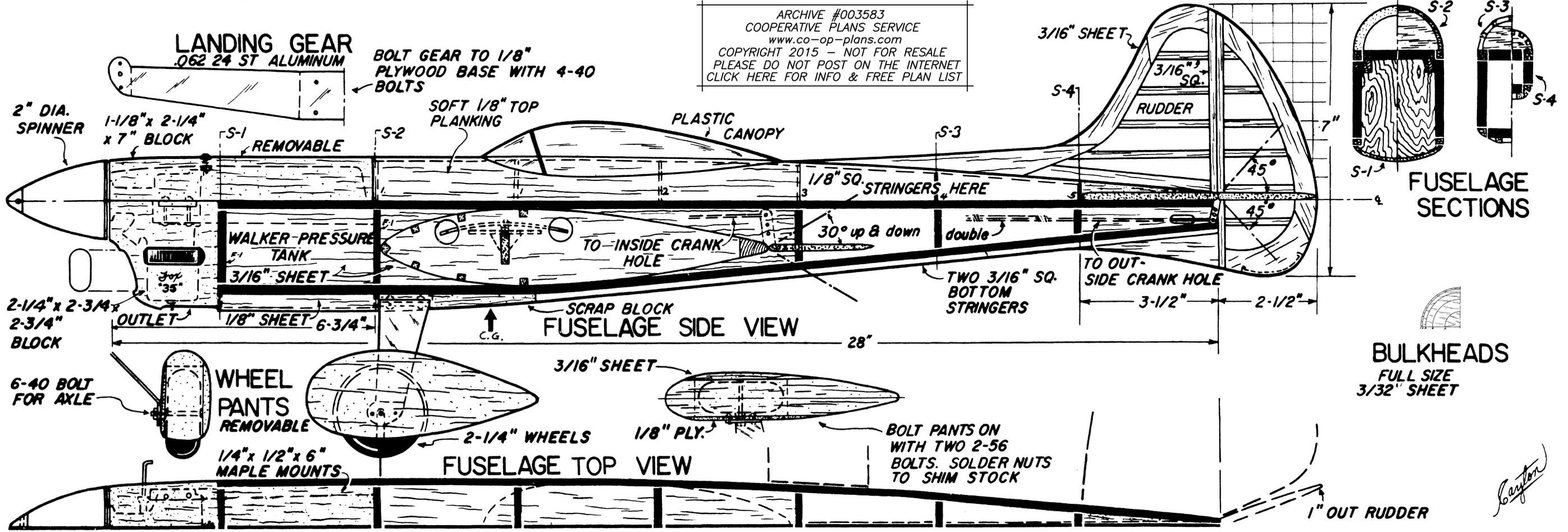


CONSTRUCTION ARTICLE IN RCMW-FSP FEBRUARY 2015 www.fullsizeplans.com CLICK HERE TO GO TO WEBSITE



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A WEEK WITH MISTER SCALE

by
Giuseppe Fascione

Q.: “Dave, did you see this movie?”

A.: “No, I rarely go to a movie.”.

Q.: “Dave, did you watch this TV show?”

A.: “No, I rarely watch TV.”

“And why is that?”

“Because neither allows me to work on my models!!!”

The Dave in this story is none other than Dave Platt, the famous Mister Scale, now 80 years young. It is quite clear he is still “fully dedicated” to the thing he likes and does the best: building airplane models!



I was lucky to have the chance to spend almost a week with him as a guest in his house in Palm Bay, central Florida. I met Dave in person for the first time in 2004, when I drove down from Washington, DC, to meet another modeler, Hal deBolt.

As it turned out Hal was sick with cancer and didn't show up, but I was able to meet many people I knew: Art Schroeder, Pete Waters, Frank Tiano and yes, Mister Scale himself, Dave Platt.



Dave Platt's FW-190 had retract gear and simulated worn look. Navy photo.

I'm sure everyone has heard about the sensation that Platt made when he showed up for the first time at the Nationals with a “worn out” Scale Model. Until then, all Scale models were shining, just as they were when released from the factory. He was the first to reproduce a truly real, operational airplane with the black stains around the exhaust stacks, chipped paint, and scuffed propellers!

After all, he is “Mister Scale” for a reason! If you need more details about his achievements, you can find his biography on the following web-sites:

<https://www.modelaircraft.org/files/PlattDavidR Dave.pdf>

or
http://www.airfieldmodels.com/masters/interviews/dave_platt/bio.htm

Among other things, Platt showed me a new transmitter designed by Ron Ellis, which simulates the Reed effect with a modern proportional radio. I was hooked!

Since then we have been corresponding by e-mail and I looked forward since our first meeting to seeing him again. One subject we have touched on more than once has been that in our hobby, while the number of “pilots” seems to always increase, the number of “modelers” is definitely shrinking. We have talked a lot about this subject, but we have not found a solution, yet... (Anyone have any suggestions?)

Dave doesn't like to drive long distances any more. Nevertheless, he decided to go to Muncie, this year, and compete in Control Line Scale, even though he was on a waiting list for a hip replacement!

He had already been National Champion in Free Flight Scale and Radio Control Scale, but not in Control Line Scale. So, why not try one more time? He went, and he won! I think this was a very unique way to celebrate one's 80th anniversary!

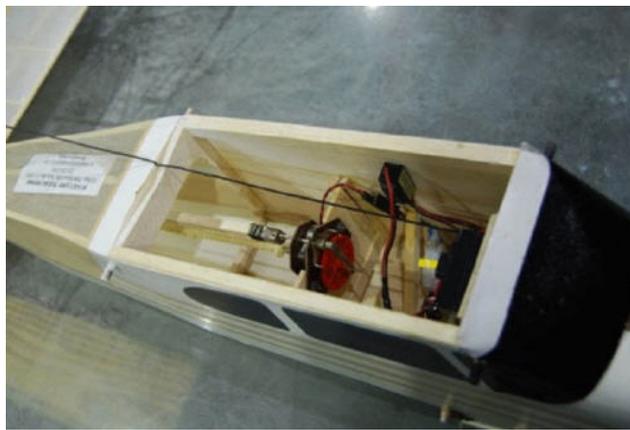


The model he took to Muncie was really incredible! The Mohawk has unbelievable details. The “windscreen”, for instance, where the wipers would have reached, it is clean, where the wipers cannot reach, it is dirty!!!

Dave is a bright Brit who still talks with a British accent and drinks his beer at room temperature. I was intrigued and decided to pay him a visit, after first stopping in Asheville, NC, to enter an SPA competition with my Sun Fli IV.



I then headed further South and Palm Bay. I knew we were going to fly Rudder Only, so I took my ZUE with me.



Dave really meant Single Channel, not just Rudder Only, and he had prepared a Rebel (a Hal deBolt design) and a Half Tone (his design) with rubber escapement in them!!!

Every single day we went out flying something different. We flew Full House Proportional, Full House Reed, Rudder Only with a big engine, Single Channel with a small engine and rubber escapement.

First, he tested his planes, and then he gave me the transmitter for any planes, any systems. I was extremely honored! On top of that, the “music” of a rubber escapement in action when the planes comes in, gliding close to you, is something really exotic, something that reminded me how I felt 50 years ago as a kid!



Once we had covered all the possible R/C control systems, we decided to take out some gliders and flew Free Flight! Dave has many gliders available, as well as rubber powered and glow powered aircraft. (By the way, did you know that he also was very popular in England for his Team Racing activity?) He also has a plane ready for every possible event you want to enter.

Dave likes to compete, I’m sure of that, but he is not obsessed with victory. I think he likes the challenge. He likes the opportunity to try something new, something he has never done before in order to see how he can cope with the situation.

Platt likes the challenge, and he likes to test himself over and over again. This might be why he considers movies and TV as a waste of time that could be more profitably used, and not only to build model airplanes.



I’m saying this because 7 years ago (if I’m not wrong; he was 73 years young at that time), he decided to learn to play guitar. And he did! He did it so well, that now he plays in a band, every Thursday night, with a vast repertoire, ranging from Country music to the Beatles (Dave is British, after all)!

So modeling is not his only hobby. His learning to play guitar is living proof that it is never too late to learn new things, if you are active and determined!



While the “Maestro” was exercising, I spent some time in his shop. I was told that some metalworking machines had been recently removed, the ones he used to build his own Glow and Diesel engines! In this picture, behind the Irvine and the Dooling, you can see an original Platt production!

In the shop you can find a lot of balsa wood, plywood, any kind of raw material you may need to build a model airplane. What you will NOT see is MonoKote or the like. Dave does not consider this a “proper” covering material. Its only use could be to protect the wing when he works on the wing fillets!!!

He has a big working bench where he draws his own creations, for his Scale and non-Scale models. The construction is actually done on a thick piece of glass, the truest building board you can have. Many working tools are handy around the room, including an unlimited number of Dremels, each one with a different tool on tap. Dave thinks that everything is easier and faster, this way.

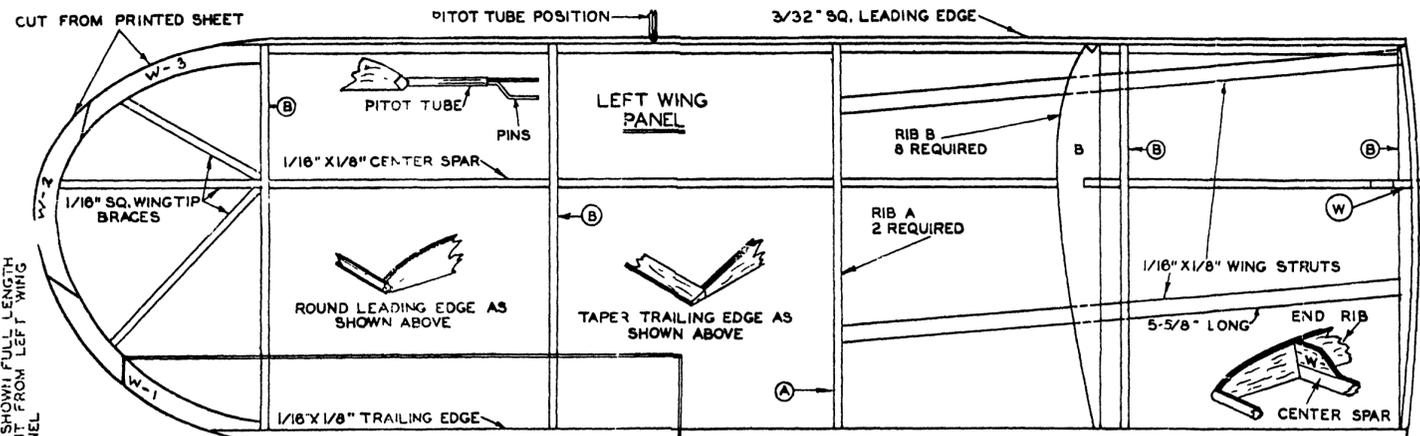
He was building a VAL, a Japanese dive bomber, at the time I was in Florida. He told me that he might start working on a Macchi 202. “...when he would be tired of it...”.



This is one of the famous Dave Platt’s statements: you never FINISH building a Scale model as there is always a new detail to apply. You just get tired of working on it!

I spent five days with him and it was as if I had been dreaming for those five days. Yes, it had to be expected, as we share the same passion, but I was fascinated by the man. Dave Platt was always extremely kind, open, and available. He didn’t have any problems sharing his “secrets” with me, explaining what he was doing and why. Spending a few days with him and knowing him better was a pleasure and a privilege I will not soon forget!





WING CONSTRUCTION

BUILD WINGS IN HALVES DIRECTLY OVER PLAN. COVER ON TOPSIDE ONLY. LEAVE CENTER SPAR OF EACH WING PROJECT 1/2" BEYOND END RIB. WHEN WING IS ATTACHED TO MODEL, GLUE THESE ENDS TOGETHER AS SHOWN IN SKETCH BELOW. TILT TOP OF END RIB SLIGHTLY TOWARD CENTER OF MODEL TO GIVE DIHEDRAL TO WING. (SEE FRONT VIEW)

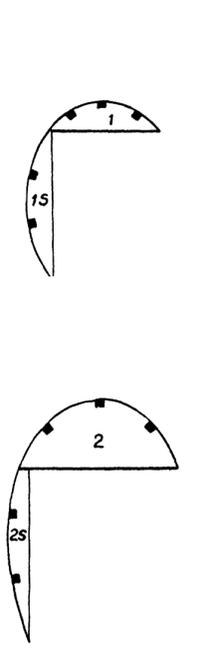
PORTERFIELD

COMET

KIT NO. A-146

25" SPAN 15-1/2" LENGTH

ONE STAR SERIES



MOTOR COWLING MAY BE GLUED TO STIFF PAPER.

SANDPAPER WING AND LANDING GEAR STRUTS TO A STREAMLINE SHAPE.

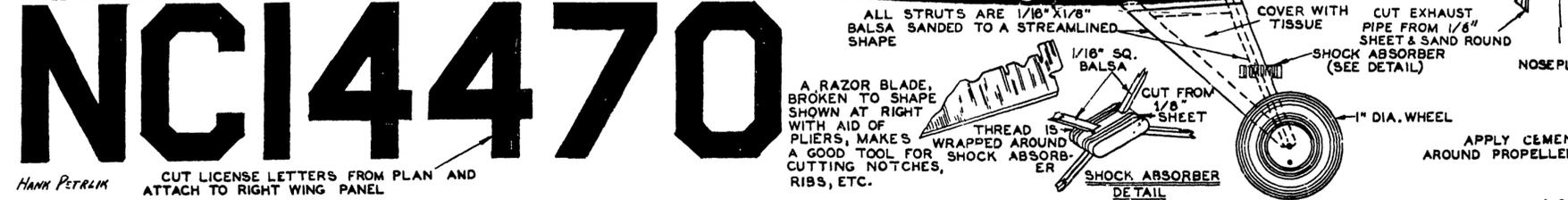
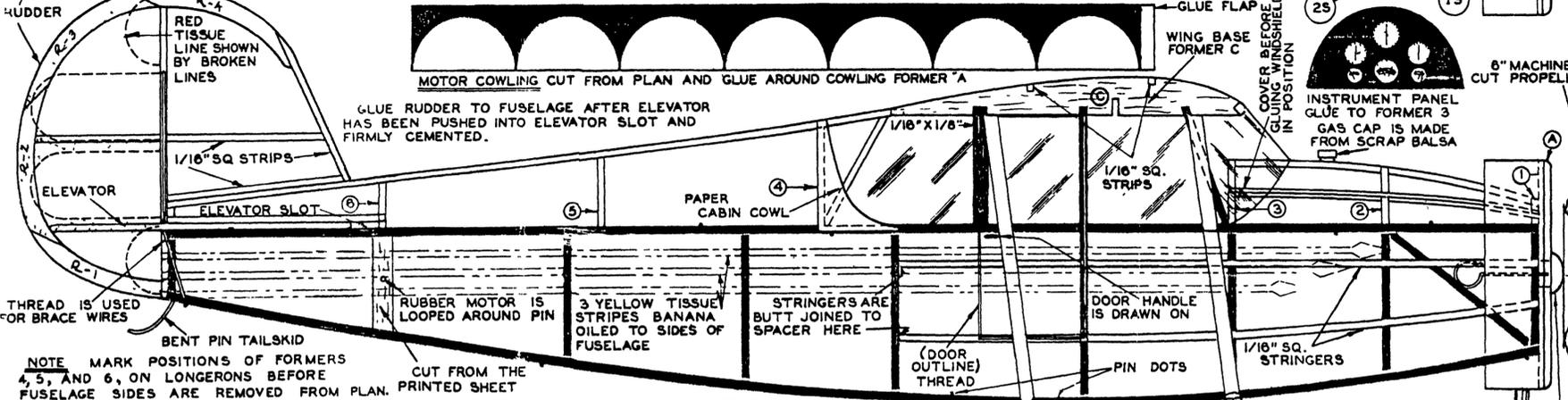
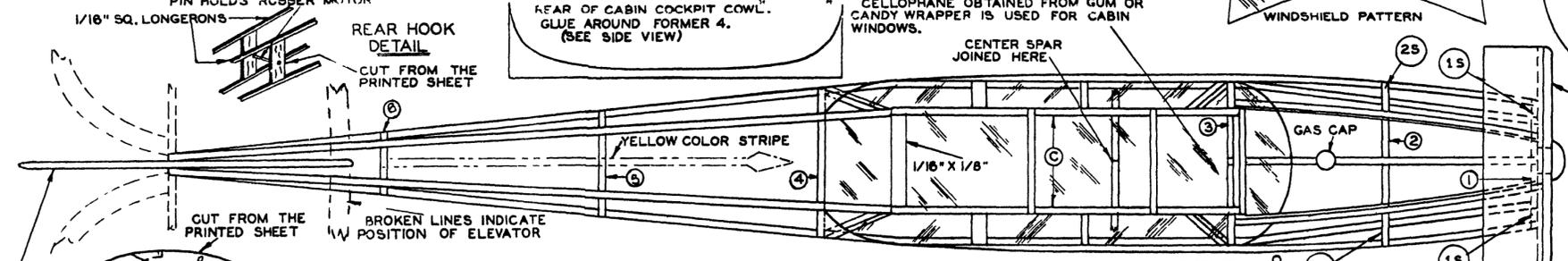
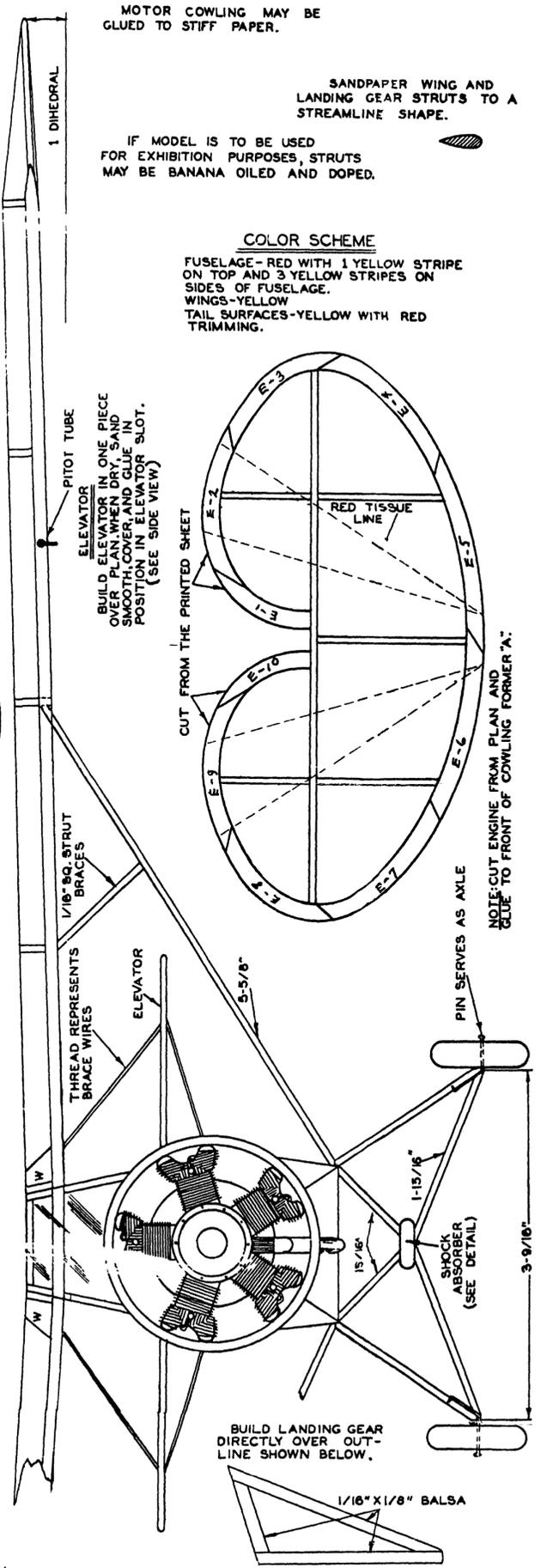
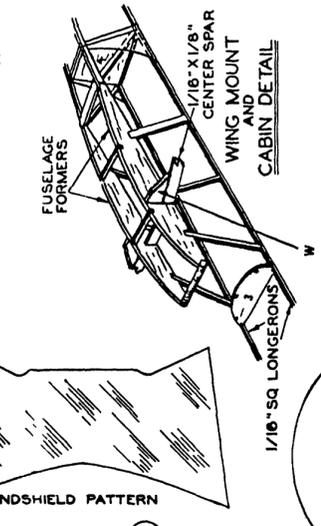
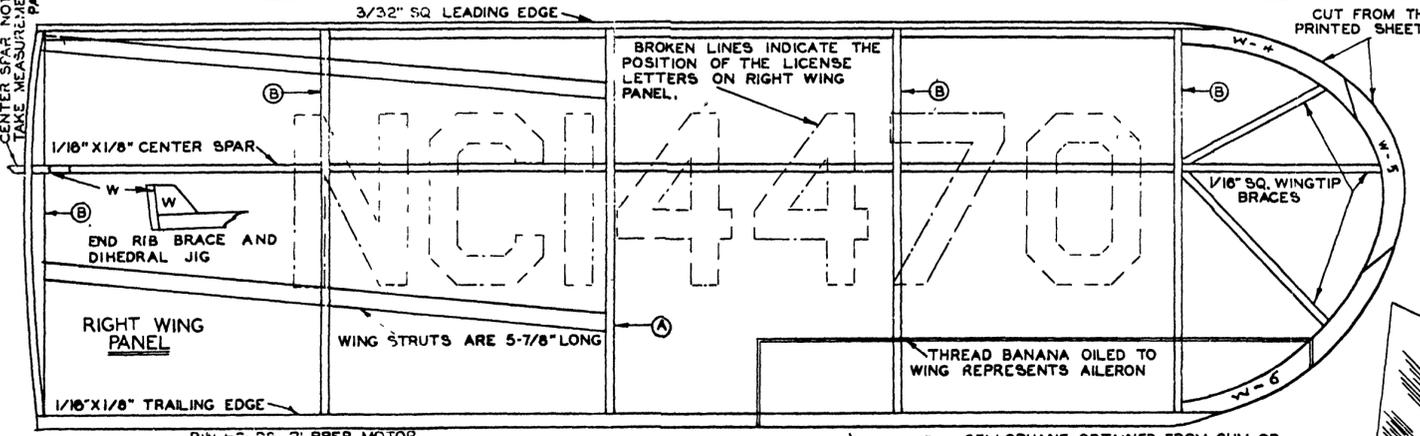
IF MODEL IS TO BE USED FOR EXHIBITION PURPOSES, STRUTS MAY BE BANANA OILED AND DOPED.

COLOR SCHEME

FUSELAGE - RED WITH 1 YELLOW STRIPE ON TOP AND 3 YELLOW STRIPES ON SIDES OF FUSELAGE.

WINGS - YELLOW

TAIL SURFACES - YELLOW WITH RED TRIMMING.



NCI4470

HANK PETRAK

CUT LICENSE LETTERS FROM PLAN AND ATTACH TO RIGHT WING PANEL

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A Good Wing

by

Dick Sarpolus

The most important part of an airplane, the heart of an airplane, the part of an airplane that really determines how the plane will fly and what its capabilities will be, is the wing. Well, I think it is.

Whether I'm buying a kit or an ARF, building from plans, or designing a new airplane from scratch, I look at the wing first. Size, area, and airfoil. From experience, I think I know about what kind of wing will provide the type of airplane that I'm looking for at the time.

THE AIRFOIL BASICS

If you want an easy, slow flyer, very stable, you want a flat bottom lifting airfoil.

For full aerobatic capability, you want a full symmetrical airfoil, fairly thick.

If you want very high speed, it's a very thin low drag airfoil.

For a scale, heavy warbird, it would be a semi-symmetrical airfoil, to carry the load and still be aerobatic.

You can pick/copy the airfoil from an airplane you know is the type you want.

A wing of built-up wood construction, ribs, spars, sheeting, etc., is beyond our discussion here.

For really easy building, for quite light weight, for use with a sheet foam profile fuselage and sheet foam tail surfaces, electric power – it's a hot wire cut foam wing.

The foam wing detailed here is shown at a basic 48" wingspan, and it can be cut down to whatever span and area you want. The wing planform is mildly tapered, the core at the root is about 9" and at the tip about 7".

Sheet foam strip ailerons are hinged to the trailing edge. It's intended to be for an easy flying but very aerobatically capable airplane with electric power of about 150 watts, average a 40" wingspan and about 400 sq ins area. The total weight of such an airplane will be about 20 ounces.

At this light weight, it's not necessary to sheet the foam wing cores, but I do use wood spars set into the upper and lower surfaces for additional strength.

To protect the foam and provide a base for painting, the wing cores can be covered with low temp iron-on plastic film. I like the SLC material sold by The Core House, it's pretty easy to iron on and takes about any kind of paint.

The wing panels are joined by a piece of 1/8" plywood, going into a slot cut into the root sections of the panels, between the upper and lower spars. With a profile fuselage, this makes it easy to have the two wing panels butt up against each side of the fuselage, and only a vertical slot is needed through the fuselage, not a complete wing cutout.

The easiest way to handle the wingtips is simply to cut them off squarely. But for a scale

model, they can be cut to any desired shape and rounded off with a sanding block.

The type of foam used for hot wire cut foam wing cores, expanded bead polystyrene foam of about one lb per cu ft density, does not sand well, it tears, gouges, and chunks out.

But that's easily fixed with some light-weight vinyl spackling putty, and hey, this type construction isn't for museum scale appearance – it's for fun airplanes that will see some crashes.

The models shown here are all made using the same basic foam wing panels. They are shortened, trimmed, cut, and sanded to suit the particular plane being modeled.

Dihedral? Most planes to be used for active, aerobatic fun flying don't bother with any dihedral, but if you want some dihedral for a more scale appearance, or if you like dihedral, cut a center plywood joiner brace for dihedral, and you've got it.

A little more basic advice, for an easier flying, more relaxing airplane – use a larger wing area, make the ailerons narrower, the elevator a little smaller, move the balance point forward, and adjust things for less control surface movement.

For a crazier flying airplane, for wild aerobatics – use less wing area, larger ailerons, larger elevator and rudder, move the balance point back, and use more control surface movement. All of these things are to be adjusted to suit the reflexes and flying "feel" preferences of the individual pilot.

Hot wire cutting foam wing cores is easy to do, but does require some specialized equipment. A hot wire cutting bow, using nichrome or stainless steel wire, and an adjustable electric power supply, typically a large Variac, are required.

Plywood templates for each end of the foam wing core are made, and pinned to the foam block for cutting. Many model airplane clubs have members who do this type of foam cutting.

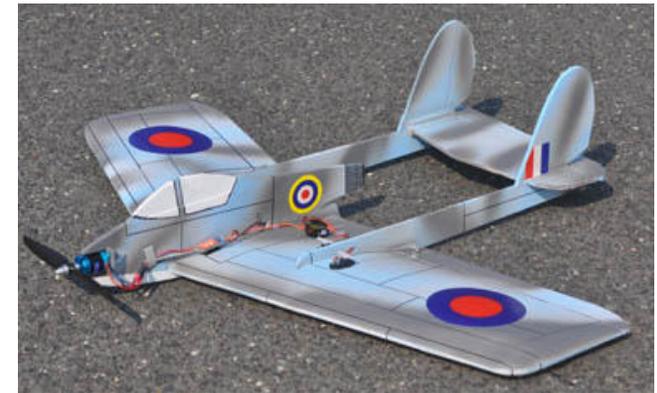
If you don't want to get into that, there are many commercial foam cutters who will do it for you. For this particular wing design of mine, my friend Phil Cartier at The Core House has a computerized, CNC guided hot wire cutting setup, and having made hundreds of these cores, sells them commercially at pretty low prices.

That makes it easy for you to build any of these planes I've designed, or go ahead and get a set of the foam wing cores, lay out a design of your own, and experiment. This stuff is fun.

PHOTOGRAPHS

Following are shots of 15 different warbird electric profile foamy models, all using the same basic foam wing design. This will give you an idea of what a variety of airplanes can be made from this one basic wing design.





TWO SPORT/AEROBATIC DESIGNS
The Too Windy and the Very Windy, again using this same basic wing design. This time, these two models are sport/aerobatic “have fun” designs.



Wing panels for a P-51 Mustang, with the wingtips rounded off and a slight mod made to the wing roots for a more scale appearance, but still from the same basic wing core.



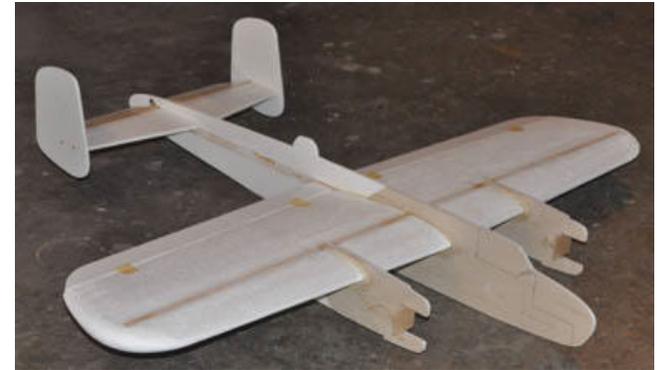
Above is a F86 Sabre and below a B25 both completed and ready for finishing and installation of equipment.

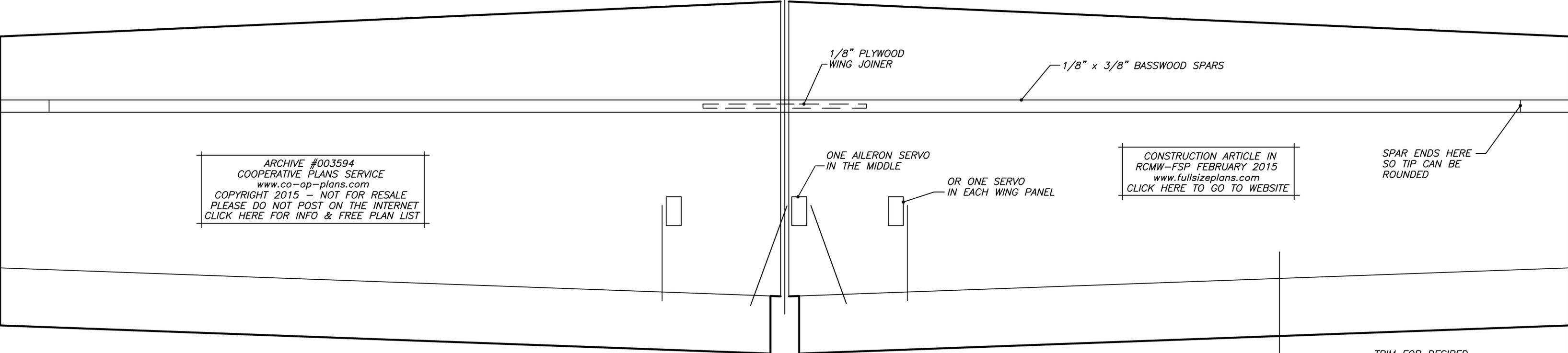


The Very Windy, a sport/aerobatic design, assembled and ready for finishing. Below, a Japanese ZERO ready for finishing.

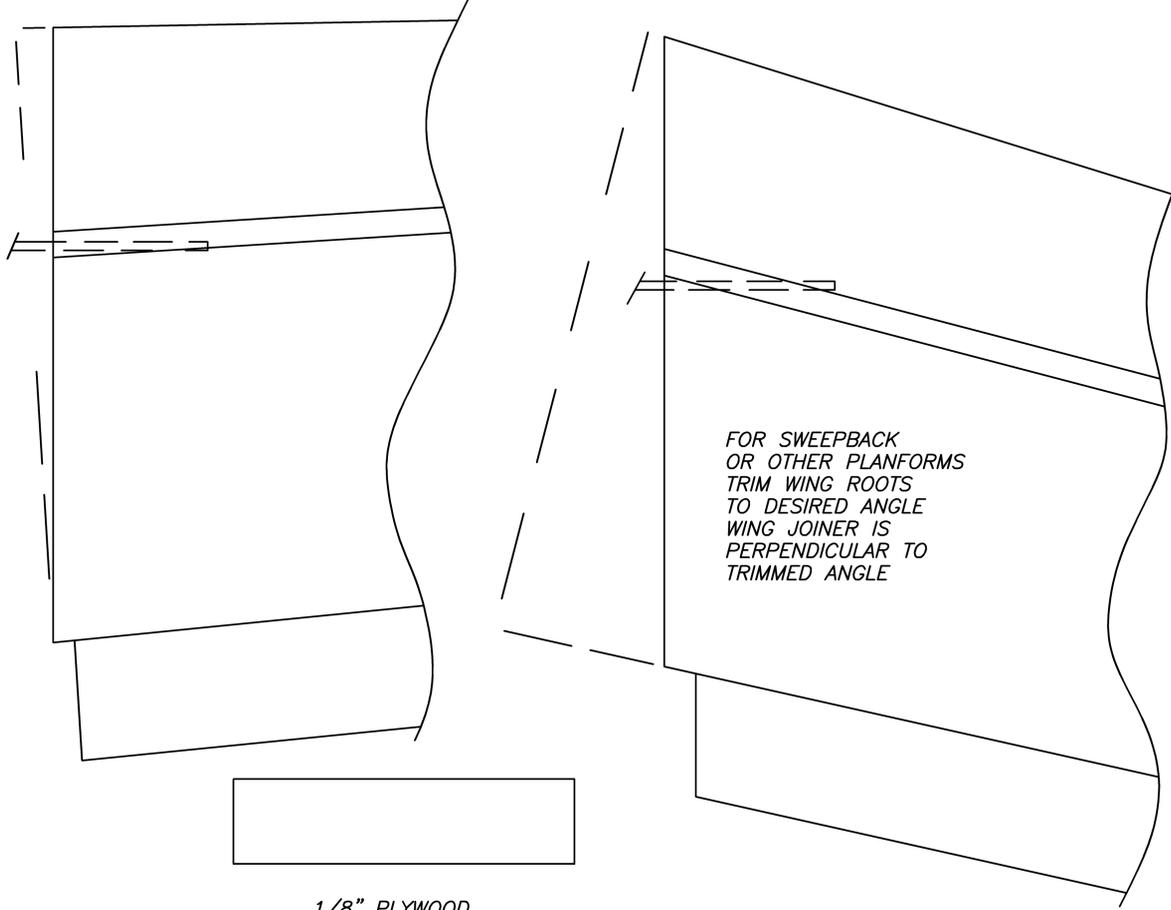


Here are a couple of photos of the hot wire cut foam wing cores, and the block of foam that they were cut from. Expanded bead polystyrene foam, one lb per cu ft density.

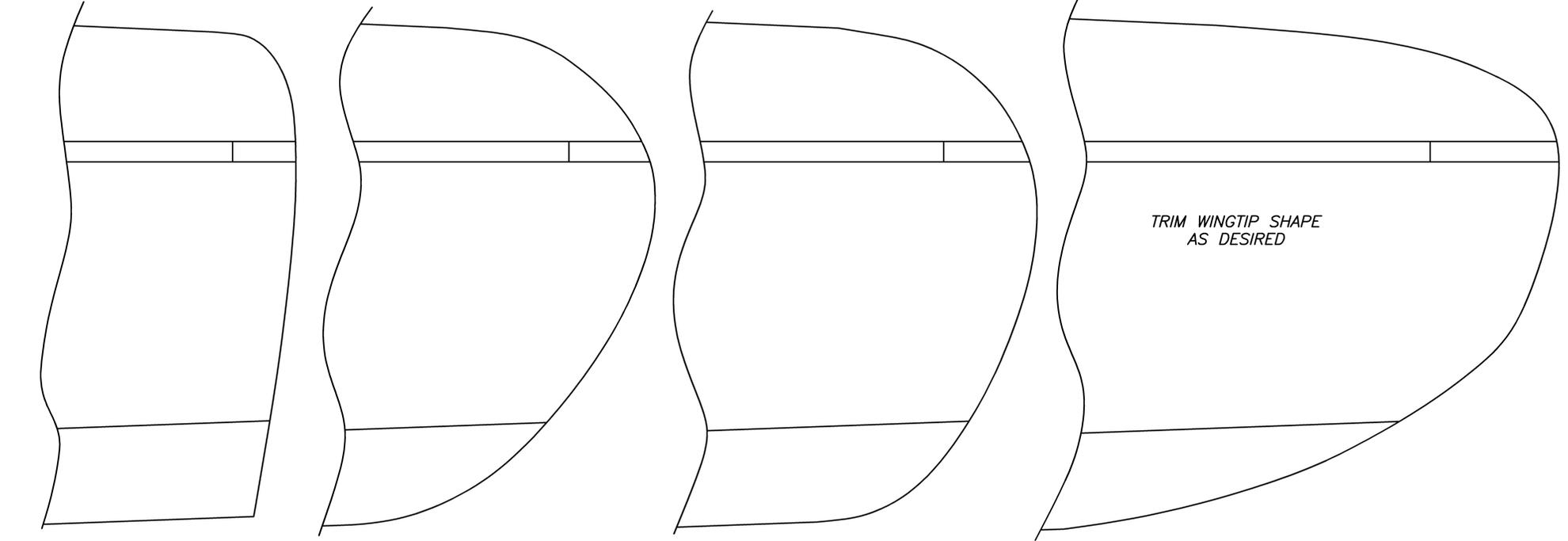




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1/8" PLYWOOD WING JOINER



FOAM WING TEMPLATE - TIP

FOAM WING TEMPLATE - ROOT

A GOOD WING

WING SPAN - 30" TO 48"
WING AREA - 300 TO 470 SQ. IN.
FOR - R/C SPORT/AEROBATIC AIRCRAFT
BY DICK SARPOLUS

NATS GNATS

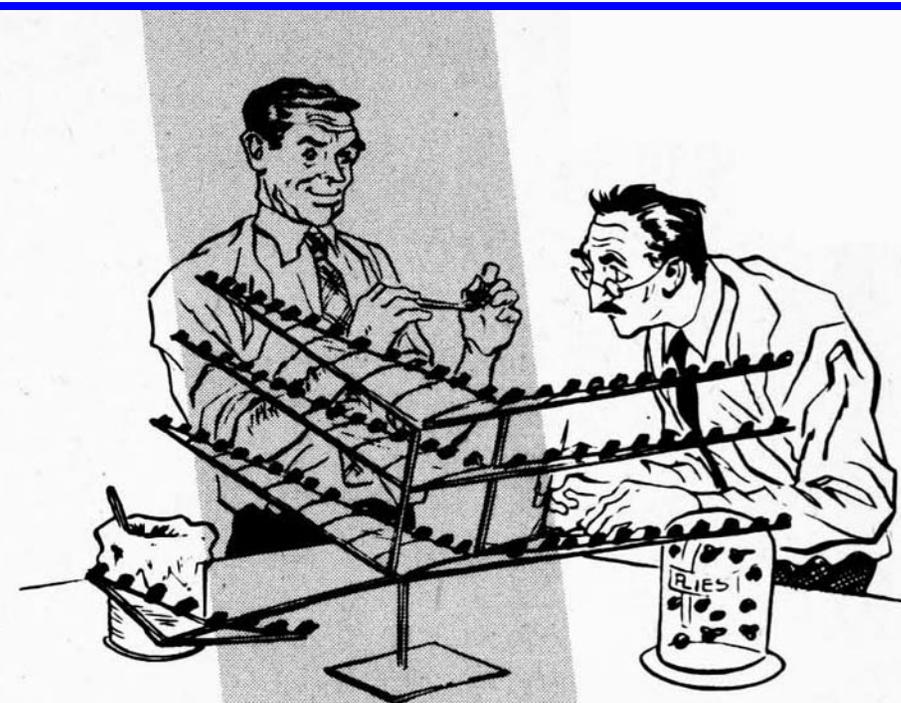


"You can overtake him if he tries to make off with your plane, but watch those ponds—he likes water!"

Editor's Notes - From the pages of the August 1955 issue of Flying Models comes this treatise by Charles Planck on INSECTONAUTICS, a field begun in 1940 in Chicago. Read all about it here. I've added some personal notes on my own experiences at the end of this article

Power—and more power!

The whole aviation world is power-mad—including the modelers! Today we have model airplane engines of 1.5 horsepower—and, sad to relate, everybody seems to have forgotten *Musca Domestica*, the common housefly, who makes an excellent model-airplane power plant. Alas and alack, nobody builds planes that can be powered with flies!



"Becoming slightly power-mad, they experimented with multiple power plants on larger models with minor success."

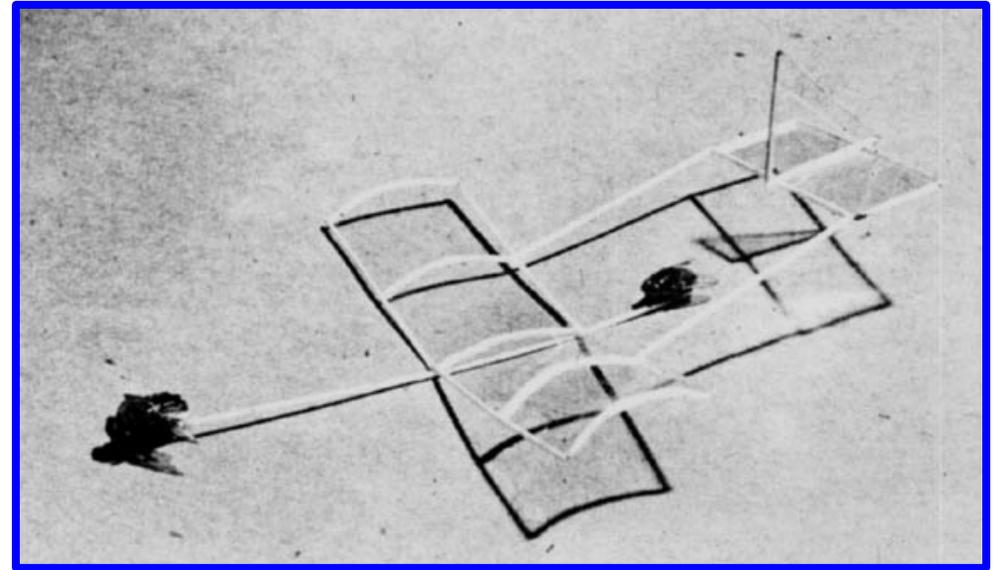
Not flies only, but many an interesting insect is waiting to power your model plane and advance the art of Insectonautics. Here is a challenge to your skill, a test of your bravery, and a promise of great entertainment for you and your friends. Insectonautics is ready for a revival!

The warm summer nights are here at last. All around you (where do they all come from?) flies, bees and moths, a million flying pests, are being born daily. They're anxious to start biting and annoying people and animals—but you can put them to work, pulling tiny model airplanes.

It all began back in 1940, at the National Model Airplane Meet in Chicago. Modelers horsing around in hotel lobbies started cementing long paper streamers to the rear of flies—then turning the pests loose to mystify lobby loafers. Then they worked up to designing and constructing virtually weightless model planes, which they powered with flies. William B. Schwab and Joe Elgin were the moving spirits in this new sport.



The idea spread—at least a little—and two College Park, Maryland, modelers—Charles and David Horsman elaborated on it. The culmination of their work was a social party at our home—guests brought their own flies and competed in flying seven small models provided by us.



The winner was Charles I. Stanton, at the time Administrator of the Civil Aeronautics Administration, who accomplished a powered flight of 26 feet, the entire length of the living and dining rooms.

The trophy, befitting the miniscule aspect of Insectonautics, consisted of a small tin world globe surmounted by a tiny white-metal plane, the whole valued at \$000.20.

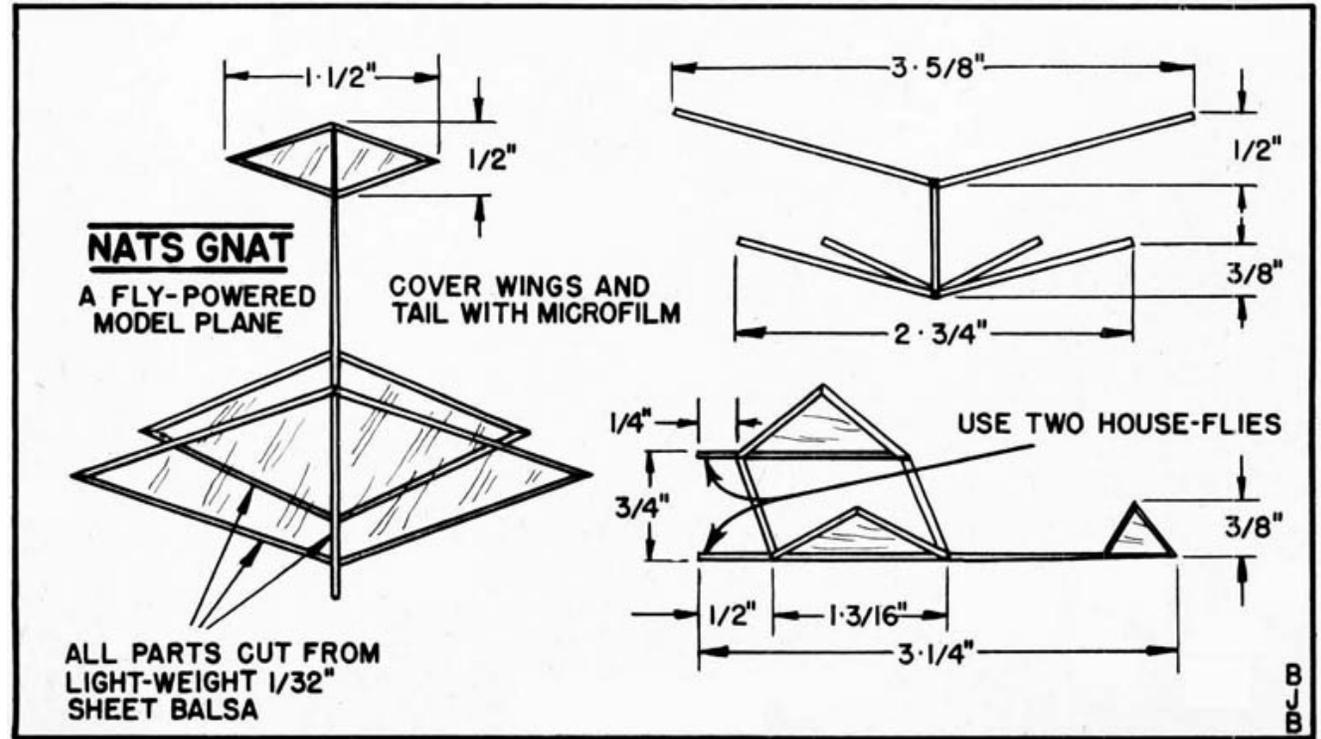
Insectonautics is challenging and rewarding. To the modeler it presents several new problems to be solved:

First, a suitable model must be made. We've solved that for you by presenting plans herewith for a biplane, built of balsa and microfilm.

Second, the engine must be caught. This is not too hard, and the variety of flying insects available will satisfy any beginner and urge him on into high-performance brackets with flies, bees and other insects of varying power, wing loading, and flight characteristics. You can even raise your own motors if you want to!



"World Champ" Charles I. Stanton, former Administrator of the C.A.A., poses with the trophy (left) he won in 1941 after a 26-foot flight. Two flies powered his plane—his best engine, a hornet-type insect, expired in the refrigerator.



C.H.T. Townsend once estimated that the botfly could reach 815 m.p.h. Dr. Irving Langmuir, light expert of General Electric, questioned this and made some tests whirling a piece of lead the size of a botfly on the end of a string, and pointed out that if a man couldn't see the fly, he couldn't time him.

Then he said the human eye could not see a botfly going at anything above 64 m.p.h. Dr. Townsend questioned Dr. Langmuir's methods—then dropped his estimate to 650 to 750 m.p.h., but held tight there.

Regardless of who is right, the botfly is a performer to aim for. He is found in high altitudes, the bug men say, and you will find him very active around bare, hot rocks in the mountains. Slip up on one in cool weather and you may be able to net him.

He should take a speed job of 6" to 8" span, but he certainly is no indoor performer. Maybe you could work up a control line and fly him as a captive. They say spider webs are pretty strong, so if you can unwind 50 feet or so, you'd have a good line. Or maybe you can figure out some other kind of strong, super-light-weight control-line.

Don't ignore the social aspects of Insectonautics. Congenial souls—enthusiastic modelers, that is—will delight in a summer evening of contests. They can bring their own planes, as well as their own power plants.

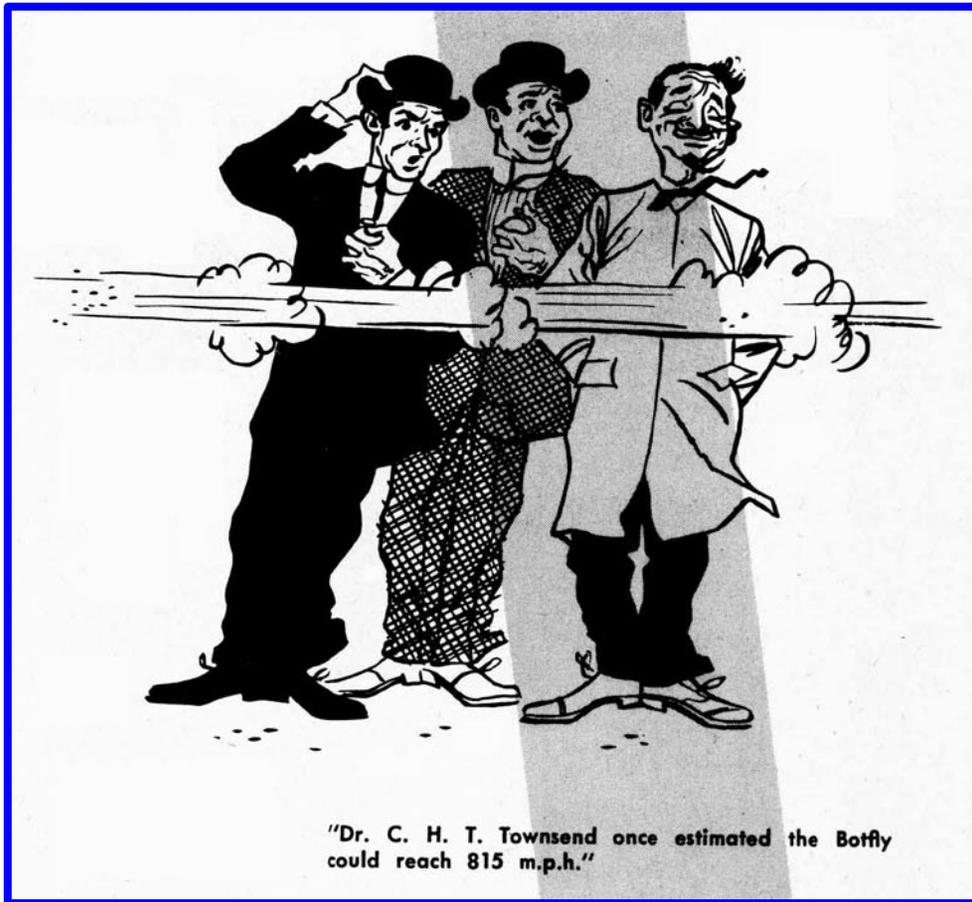
For non-modelers, the host should provide planes. The planes are tiny and easy to build so you can turn out a lot of them quickly and cheaply.

Two more tips on handling: No matter how delicate the fingers, a human is likely to injure an active fly while installing him on a plane. Make tweezers of balsa with a block near the tips to keep the fly from being squeezed too hard.

And use your refrigerator. Put a lively fly in a glass and place him in the cooler for 10 minutes, and you can pour him out on the table and take your time cementing him in place.

When he is installed and all is ready, breathe on him until he warms up and starts revving up his wings. Then hold the plane before your face and blow gently on the rear of your "engine".

When he starts working his wings, give him a launch, and there you are—in Insectonautics!



"Dr. C. H. T. Townsend once estimated the Botfly could reach 815 m.p.h."

And now for those personal notes promised at the beginning of this missive.

I was studying Aeronautical Engineering at the University of Minnesota in the late 1950's and had been hired as an undergraduate research assistant (sort of a technical go-fer).

We worked part time during the school year and full time during the summer session. The professor I worked for was Dr Helmut Heinrich, a German scientist and world expert on parachutes and drag producing devices.

Our main research lab was located in a large hanger with sliding doors that opened to allow full size aircraft to be brought in. In the summer they were usually open when the weather was nice as air conditioning was pretty much unknown.

We weren't sure where they came from but when the doors were open we had some resident horseflies that were giants compared to the common housefly. So it was natural that some of the free spirits among our group, like myself, would engage in a bit of INSECTONAUTICS.

At that time Eastman 910, a VERY expensive adhesive used to install strain gages on wind tunnel test articles was kept in a refrigerator along with other scientific equipment such as lunches. These days the same adhesive is widely known as CA or Cyano and is not all that expensive, but then I recall that it was nearly \$100 for about quarter ounce and was treated like liquid gold. And those were 1950's dollars, too.

Old Model Airplane Magazines

If you're like me, you enjoy paging through model airplane magazines and plans, sometimes to find a project to build, to research a particular aircraft, or to just spend some pleasant time away from the daily grind.

If you like to build models, the magazines of today don't offer much since they are primarily expensive catalogs of ready-to-fly models. There's nothing wrong with RTF or ARF models but they don't offer much to interest model BUILDERS.

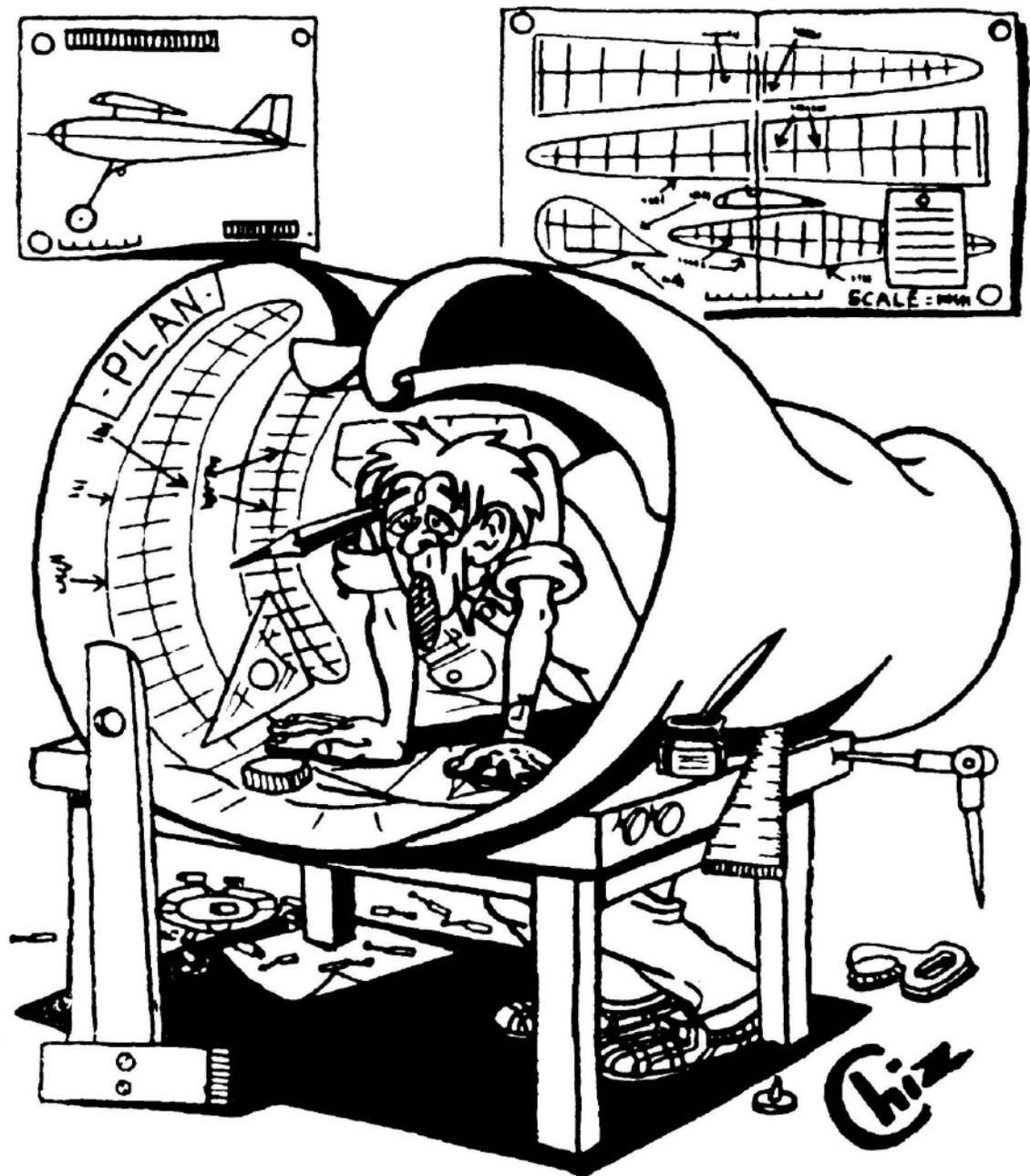
That's NOT the way it was in the past, when you had to build a model before you could fly it. If you're an old-timer, as I am, you have fond memories of *Air Trails*, *Flying Models*, *Model Airplane News*, *Aeromodeller* and many of the several other magazines available "way back when".

If you're a relative newcomer to modeling and want to learn how to build them, those old magazines can provide a wealth of useful information, plans and how-to-do-it articles.

There are several problems with those old magazines. They are sometimes hard to find, often in bad condition, and in many cases they are so fragile that they can fall apart just by turning the pages. This is because they were often printed on pulp paper, also known as newsprint. Newsprint is inexpensive, but has residual chemicals that cause it to deteriorate when exposed to the air and particularly to sunlight. Your wife or "significant other" might also ask "When are you going to get rid of all those smelly old magazines?"

I admit to being a bit of a "nut case" but have been collecting these magazine for over 50 years and now I am trying to digitize them to preserve them for other modelers. They are now available as digital PDF files. See the details on the next page.

Keep 'em Flying - Roland Friestad



AEROMODELLER DECEMBER 1952
USED WITH PERMISSION

We have switched to USB Memory Cards Much More Reliable

Magazines are scanned at the same or at higher resolution than was used in their original publication and all pages can be printed out if desired.

It is easy to page through each issue and, unlike the old paper originals, they won't be damaged by handling.

Prices shown include postage worldwide. USB drives are burned to order and posted weekly.

AIR TRAILS - This magazine went under several names. The final issue was published in March of 1975. There are 435 monthly issues included in the complete set and priced as follows ---

D001010 - January 1937 through December 1943 - 84 issues - **\$50**

D001011 - January 1944 through December 1950 - 84 issues - **\$50**

D001012 - January 1951 through December 1961 - 132 issues - **\$50**

D001013 - January 1962 through December 1971 - 96 issues - **\$50**

D001014 - January 1972 through March 1975 - 39 issues - **\$25**

AIR TRAILS ANNUALS -

D001009 - 1938 through 1969 - All 25 issues - **\$30**

D001015 - SPECIAL - Complete set including the annuals - \$200

MODEL AIRPLANE NEWS - The first issue of this magazine was published in July of 1929 and it is still in publication. We have the following collections currently available ---

D001002 - July 1929 through December 1942 - 161 issues - **\$50**

D001004 - January 1943 through December 1952 - 120 issues - **\$50**

MODEL BUILDER - This magazine ran from the first issue of September~October 1971 through the final issue dated October, 1996 -

D001001 - The complete run - 295 issues - **\$75**

FLYING MODELS - The first issue of this magazine to use the name was published in June of 1947 and it is still in publication. We have the following collections currently available ---

D000013 - June 1947 through December 1963 - 123 issues - **\$50**

RC MICRO FLIGHT & RC MICRO WORLD - The complete run of RC Micro Flight, 1999 through 2004 and all issues of RC Micro World, 2005 through 2012 are available - D001016 - **\$30**

Currently being digitized are complete runs of **RC MODELER** and **AEROMODELLER**. RC Modeler is coming along and is scheduled to be done by March 2015 - Aeromodeller should be completed by the end of 2015 - Prices have not been set yet -

The digitizing of several other magazines will follow including **MODEL CRAFTSMAN, FLYING ACES, POPULAR AVIATION, MODEL AIRCRAFT** (British) and others. This is a long term project. Many thousands of hours and dollars are represented in these collections.

All prices include postage worldwide

Send payment using Paypal to
cardinal.eng@grics.net

Or check or money order to
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1640 N Kellogg Street
Galesburg, Illinois 61401
USA

**Makes a Great Gift for Modelers
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sheet to someone who has a hard time
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November 30, 2014 - Prices & Specifications subject to change without notice