

RCMW-FSP

February 2016



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Cover From
Aviation History
July 1996
Art By
Sonny Shug

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USA

For the Model Bulder and Flyer - February 2016 Issue



Full Size Plans



Well the big news this month, and it's not particularly good for those of us who like to build and fly model airplanes, is that the FAA (Friendly Aviation Administration) has put forth their rules on UAS (Unmanned Aerial Systems) model airplane flying in the NSA (National Air Space). Those guys sure like to use letters instead of words. I wonder why that is ?

At any rate, the rules strike me, and just about any other modeler, as being overly strict and unrealistic as applied to model building and flying. I understand that these guys are responding to the perceived threat of the idiots who fly quadcopters in an unsafe manner or maybe even to intentionally cause damage or harm, but it escapes me why everyone should suffer because of the stupidity or evil intentions of a very few. It sort of confirms that so-called motto of the FAA, "We're Not Happy Until You're Not Happy"

In line with that we have reprinted on pages 4 and 5 of this issue the form that the FAA has supplied for use by the police when submitting a report that one of us are flying in and unsafe or unauthorized manner.. I suggest you read it and be aware of what you will be asked and what you should reply if you are unfortunate enough to be confronted by one of the "Boys in Blue" while operating a DANGEROUS model airplane. Looks like there will be a large growth in the flying of models under about 8 ounces in weight. Contact the AMA for help.

Now again on to more pleasant topics than the FAA. Our first model for this month is a new design by our regular contributor Bob Aberle. His offering is the MIDIWATT 200, a 200 sq.in. version of a design originally by Bob Hunt.

We are trying something a bit different for the first time in this issue, the plan is reduced in size to fit the standard letter size page and at the bottom of the plan is a link to allow you to download the full size PDF file. You can save the full size file individually. This has two advantages, first the download size of each issue is reduced and second the individual full size files should be less confusing to your copy shop or office supply store for printing.

We've included a plan from Dick Sarpolus for his SLEDGE HAMMER, a large RC design. Also included is Berkeley's SINBAD THE SAILER. We had the original kit on hand and have also provided copies of the original printwood patterns along with a method to print them out. Let us know what you think.

Next is the CESSNA BIRD DOG, a Half-A free flight scale job from the British magazine Aeromodeller. Along with that is RUBBERDUB a rubber powered sport model from the same issue.

This month's magazine download is the October 1956 issue of FLYING MODELS. Just look at those prices !!

The first of the Aeromodeller digital archives are now available on our custom made USB Flash Drives. All 240 issues from the 1950's and 1960's are now scanned and preserved. These are a bit hard to find. See page 31.

Keep 'em Flying,
Roland Friestad, Editor

LEO Guidance for Unmanned Aircraft Systems (UAS)

If you suspect a UAS operation is unsafe or unauthorized:



1. Locate the operator
2. Ask for registration and verify markings¹ on the UAS - Required for all UAS greater than 0.55 lbs
3. Ask operator for the type of operation and to present appropriate documentation (see reverse)
4. Interview operator and collect the following information:
 - Name, address, and positive ID of operator
 - Record Registration Number and the FAA Docket Number from Exemption or COA (see reverse)
 - Document time, place, and details of flight (take pictures and interview witnesses, etc)
5. Take action based on local Laws, Ordinances, Directives
6. Contact the FAA:
 - General inquiries – contact the Regional Operations Center (see below)
 - Investigation support – contact an FAA Law Enforcement Assistance Program (LEAP) Special Agent (business hours)

Local Protocol:

FAA REGIONAL OPERATIONS CENTERS:

| | | | |
|------------------------|----------------|--|-----------------------|
| Eastern | (404) 305-5150 | DC, DE, MD, NJ, NY, PA, WV, VA | 7-aea-roc@faa.gov |
| Southern / New England | (404) 305-5156 | AL, CT, FL, GA, KY, MA, ME, MS, NC, NH, PR, RI, SC, TN, VI, VT | 9-aso-roc@faa.gov |
| Western | (425) 227-1999 | AK, AZ, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY | 9-wsa-opsctr@faa.gov |
| Central | (817) 222-5006 | AR, IA, IL, IN, KS, LA, MI, MN, MO, ND, NE, NM, OH, OK, SD, TX, WI | 9-csa-roc@faa.gov |
| Washington | (202) 267-3333 | National | 9-awa-ash-woc@faa.gov |

**** If you need immediate assistance from the FAA call (202) 267-3333 ****

Here is the front side of the report the local police will send to the FAA

Types of Authorized UAS Ops and Required Documentation:

Required documents must be in operator's possession and presented to law enforcement upon request per 49 U.S.C. 44103(d)

Model Aircraft

An unmanned aircraft that is 1) capable of sustained flight in the atmosphere, 2) flown within visual line of sight of the person operating the aircraft, and 3) flown for hobby or recreational purposes. Must be operated within **ALL** of the following parameters:

1. Strictly for hobby or recreational use
2. Must give way to manned aircraft
3. Less than 55 pounds ²
4. Operated in accordance with community based set of safety guidelines ³
5. If within 5 miles of airport, must notify airport operator and control tower (if tower)
6. Registration and Markings¹

Model aircraft operating standards are governed under P.L. 112-95 (Feb 14, 2012)

Non-Model / Commercial

Any UAS operation conducted for non-hobby or commercial purpose **OR** any operation that does not meet the parameters for Model Aircraft. Operator must possess **ALL** of the following documents:

1. Section 333 Exemption or Aircraft Certification ⁴
2. Certificate of Authorization (COA) ⁵
3. Aircraft Registration and Markings ¹
4. Pilot certificate ⁶

Public / Government

Public agencies or organizations that conduct UAS operations for a government function.

Operator must possess **ALL** of the following documents:

1. Certificate of Authorization (COA) ⁵
2. Aircraft Registration and Markings ¹

ALL UAS:

- Must have Registration and Markings¹ (required for all UAS greater than 0.55 lbs)
- Must not endanger persons or property on the ground
- Must give way to and not interfere with manned aircraft
- Must comply with all flight restrictions and Temporary Flight restrictions⁷
- Are subject to legal enforcement for Careless or Reckless operation

¹ Aircraft Registration and Markings: All UAS greater than 0.55 lbs are required to be registered, regardless of the type of operation. The operator must provide the registration certificate (paper or electronic) upon request and the UAS must be marked with registration or serial number. UAS purchased on or after December 21, 2015, and used exclusively as model aircraft must be registered prior to operating in the NAS. UAS that have been operated in the NAS by the current owner, and used exclusively as model aircraft prior to December 21, 2015, must be registered by February 19, 2016. To verify registration, contact a LEAP agent during normal business hours or the Regional Ops Center after hours.

² Aircraft is limited to no more than 55 pounds unless certified through design, construction and inspection by community based organization.

³ A membership based association that represents the modeling community and provides its members a comprehensive set of safety guidelines.

⁴ 333 Exemption: FAA Letterhead dated and signed with an Exemption Number and Regulatory Docket Number. Includes conditions and limitations such as: (Not required for UAS with an FAA Airworthiness Certificate or Public/Government Operators)

- Line of Sight: The UAS must be visible at all times to the operator using his or her own natural vision.
- Daytime only: Unless specifically authorized in the COA, UAS operations must be conducted during daytime only.

⁵ Certificate of Waiver or Authorization (COA): FAA Form 7711-1 signed by UAS Tactical Operations Section and includes FAA Docket Number. Addresses specific restrictions such as:

- Altitude: As stipulated on cover page of COA. Generally 400' or 200' (but can be higher).
- Proximity to Airports: As stipulated on COA.

⁶ Pilot certificate: All non-model/commercial operators must have an FAA pilot certificate (Government agencies may self-certify pilots)

⁷ Temporary Flight Restrictions (TFR) are common for Presidential movements, select sporting events, theme parks. Active TFRs are published here: www.tfr.faa.gov



Here is the back side of the report the local police will send to the FAA

MIDIWATT

200

by

Bob Aberle

Originally an electric powered RC Sport Model from 1996 Scaled down to 200 sq.in.

BACKGROUND

Back in the 1994 to 1996 time frame, my flying partner for many years and a fellow member of the AMA Hall of Fame, Tom Hunt and I started a model airplane business known as, MODELAIR TECH.

The basic charter for our business was to develop electric power systems and then provide aircraft designs that utilized these systems. Basically we developed belt drives for inexpensive brushed motors. Brushless electric motors didn't come into the hobby market until much later.

Tom designed all the planes for our business and, since I was retired from my job at Grumman, I became the "builder" in our partnership.

Tom produced the plans and I produced most of the prototype aircraft. To make the aircraft as simple as possible, he utilized stick type construction on many of his designs. The entire aircraft was sticks. By using bent sticks, there was no need for wing ribs. That made life easier for the average modeler.



One of Tom's sticks designs, that quickly became my favorite was his "MIDIWATT" (circa: 1996). This plane had a 52 inch span, 510 square inches of wing area and weighed about three pounds. This is a 1996 photo showing me holding the first "MIDIWATT" that I built from Tom's plans.

I flew this particular model for at least a six year period. It became our test bed for new belt drives using constantly improving brushed motors. Truly a work horse aircraft for our fledgling business.

Then in more recent times I decided to re-visit the MIDIWATT, but this time at a greatly reduced 100 square inches and a total weight of just 4.0 ounces. A true micro model with indoor flying capabilities. This is the resulting "MICRO-MIDIWATT" that appeared as a construction article in the June 2011 issue of RC MICRO WORLD.



To give you an idea of the tiny size, here is a photo of me holding the micro version.

CHANGES MADE to ORIGINAL



This is what the current MIDIWATT-200 looks like. The wing span is 32 inches, area 200 square inches and a weight range of 14 to 16 ounces.



I placed my Spektrum DX-7 transmitter next to the MIDIWATT-200 to give you a rough idea as to the size.

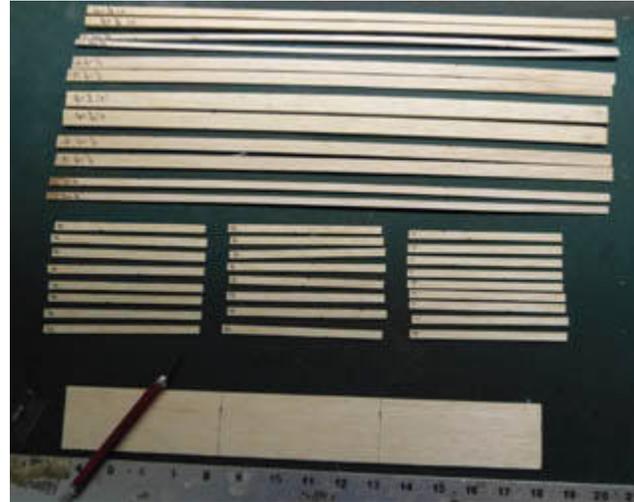


The only physical change from the original design was to increase the nose length slightly for fear that the model might come out tail heavy. As it turned out, with the extended nose, I ended up nose heavy. This required the use of a lighter weight (lower capacity) battery pack and a 1 ounce lead weight in the tail. I'll talk more about the battery pack choices later on in this article.

I kept the wing airfoil, stab and vertical fin area all identical to the original planform. I did remove a series of lower fuselage formers and a "keel" of sorts. It just wasn't worth the effort. The dihedral, was per the original and is just enough so that the wing doesn't look like it was "drooping".

CONSTRUCTION NOTES

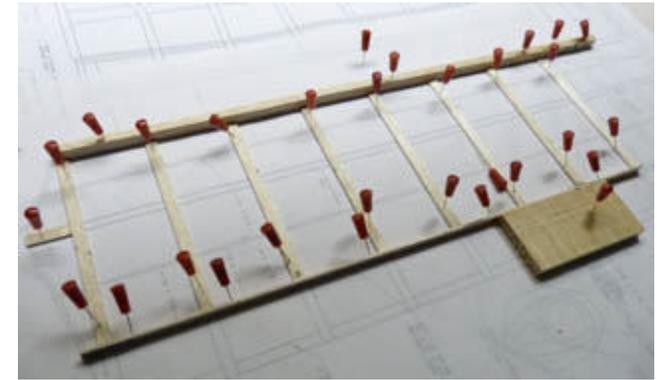
The first thing I have to address is the use of 1/16 x 1/4 medium balsa strips instead of actual wing ribs. This eliminates cutting out ribs, but you must be careful during the assembly process. This is what the wing material looks like, a pile of sticks!

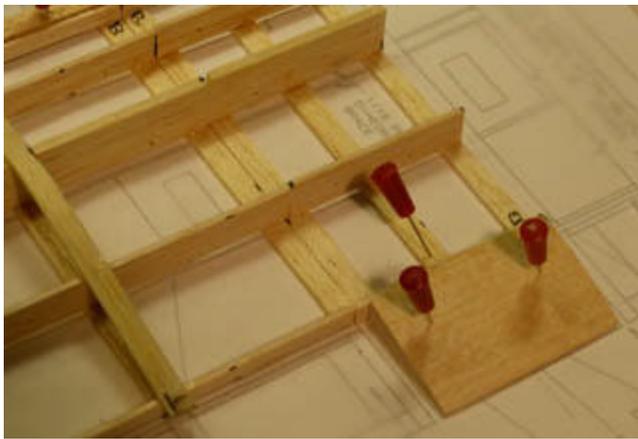


The key to the success of this wing structure is that each spar must be an exact height. The front spar is 7/16 inch high, the middle or main spar is 9/16 inch high and the rear spar is 7/16 inch, the same as the front spar. You basically have a leading and trailing edge, then three spars.

Because of the odd sizes you will have to strip the spars from balsa sheet material. The 1/16 x 1/4 strips for the ribs, must be medium weight balsa. Too soft and they will break as you lay the strips over the spars. Too hard and they won't bend properly which could lead to a slightly "rounded" wing bottom.

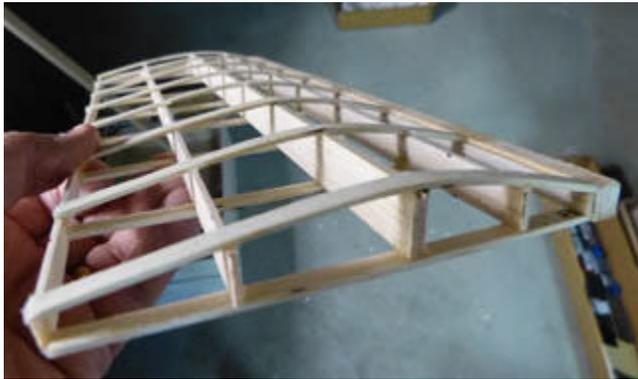
What I found helpful is to lightly spray each wing strip with Windex or Denatured Alcohol. This will allow the strip to bend more easily without breaking. Either liquid will evaporate quickly and will not affect the use of CA medium cement. Here are some "start-up photos."



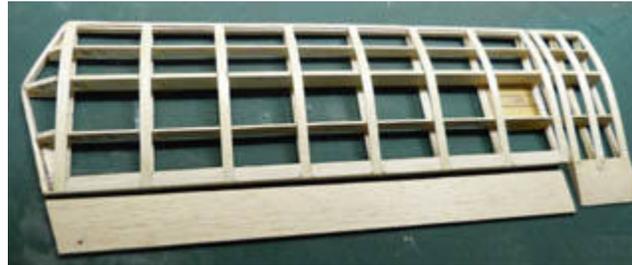


A piece of thick trailing edge stock is placed at the rear of the flat wing center section. The hold down bolt will go through this stock as you will see later on.

The next two photos will give you an idea as to how the wing airfoil takes shape, without the need for any ribs.

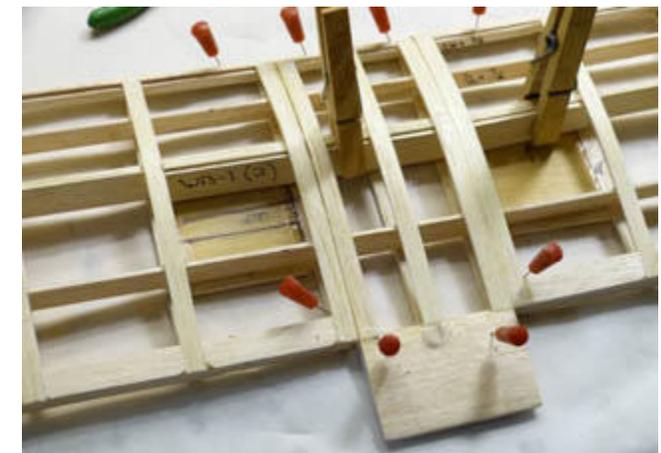
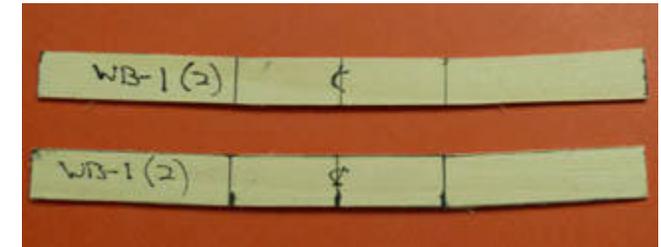


The ailerons are constructed from 1/8 inch medium balsa. The trailing edge is made from 1/16 x 1/4 balsa which stands vertically. After covering the wing and ailerons later on, the aileron control surface is hinged so that it is flush with the top of the wing. You will see this on the plans.



An insert of 1/16 plywood is mounted flush with the bottom of the wing. There is one of these ply inserts on each of the two wing panels. After covering, the two micro aileron servos will be attached to these ply inserts using double sided tape along with some Permatex clear RTV Silicone Adhesive (#80050). Make sure you have clearance holes in the plywood for the passage of the aileron cables.

Wing panel joiner WB-1 is made from 1/32 inch plywood. You will notice that the wing has very little dihedral. Just enough so that the wing doesn't appear to be "drooping". The wing brace is attached to the main spar which is the middle and tallest wing spar. Clothespins come in handy to hold the brace firm while it is cemented to the spar.



and then use a 1300 or 1400 mAh pack and still be able to eliminate that lead in the tail.

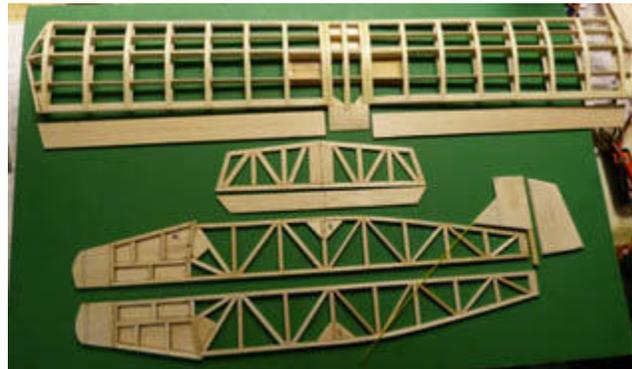
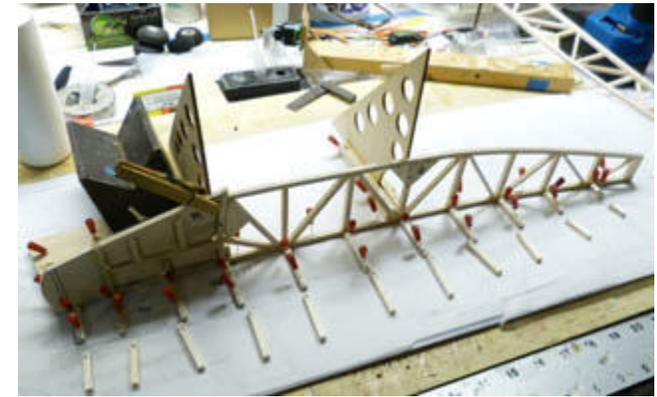
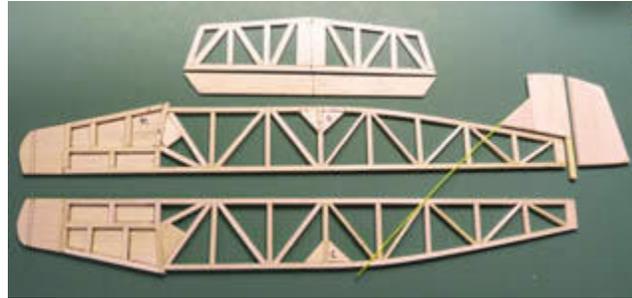
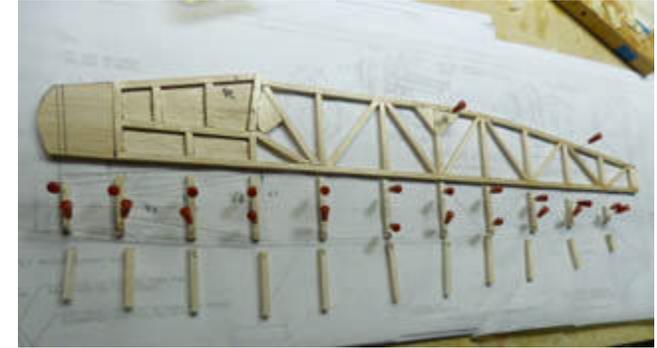
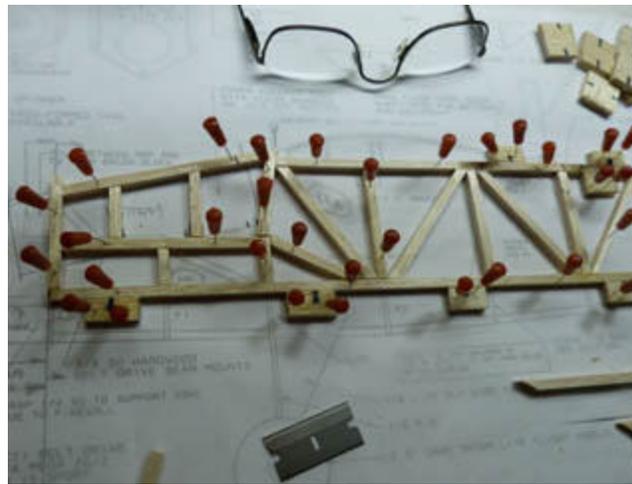
But I started with the lowest capacity 850 mAh pack and found that I could obtain a 7 minute motor run all at full throttle. With some throttling for maneuvers, I could probably get 10 minutes run time. I think that is more than enough.

By the way the posted total weight of 14.5 ounces included that one ounce of lead weight. Shortening the nose could possibly eliminate an ounce of weight. At 13.5 ounces and 86 watts input power, this plane could really move.

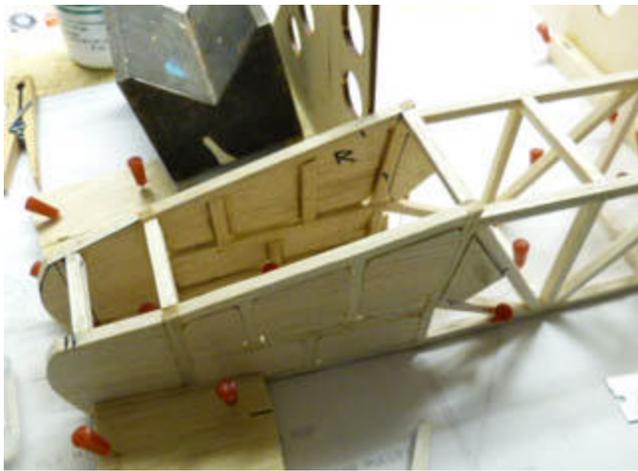
The motor selected is from Lucien Miller at Innov8tive Designs. It weighs 1.7 ounces. I selected an APC 7 X 5E prop to obtain the 86 watts input power. You could go to an APC 7 X 6E prop and get closer to 100 watts input power. But by doing that you will also be drawing more current.

NOW BACK TO THE CONSTRUCTION

The fuselage is next. It is basically made up of 3/16 inch square balsa sticks. Medium grade would be fine. You build two identical sides using scrap balsa pieces as a sort of building jig. The nose section is filled in with 1/16 inch sheet balsa. Essentially you make the balsa flush with the outside of the fuselage. You then end up with one left fuselage side and one right.

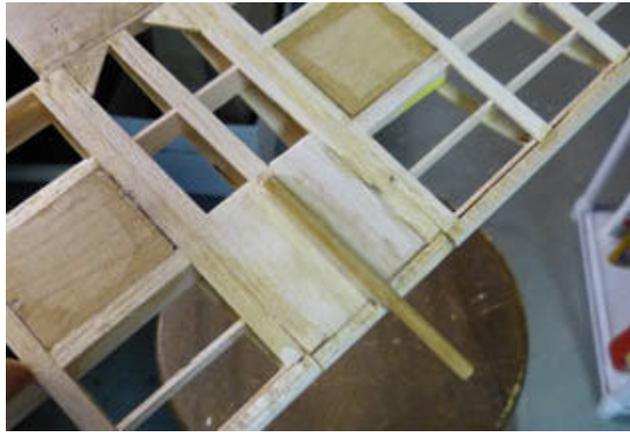
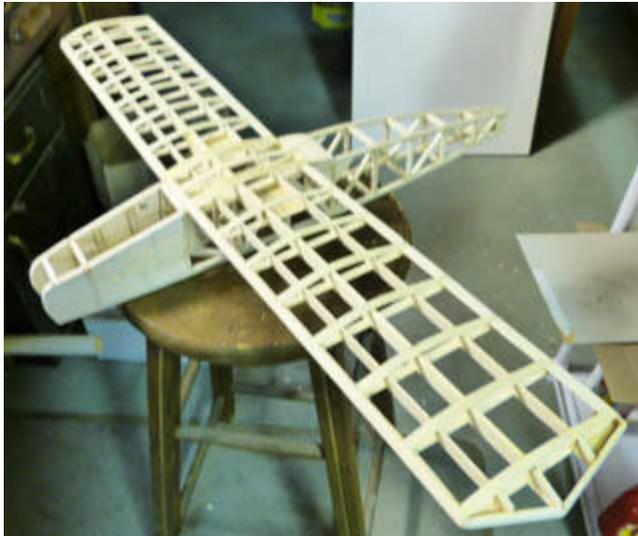


The beauty of this design is that the bottom of the fuselage is perfectly flat. I cut out the top and bottom pieces using the top view of the fuselage. The next few photos tell the story.

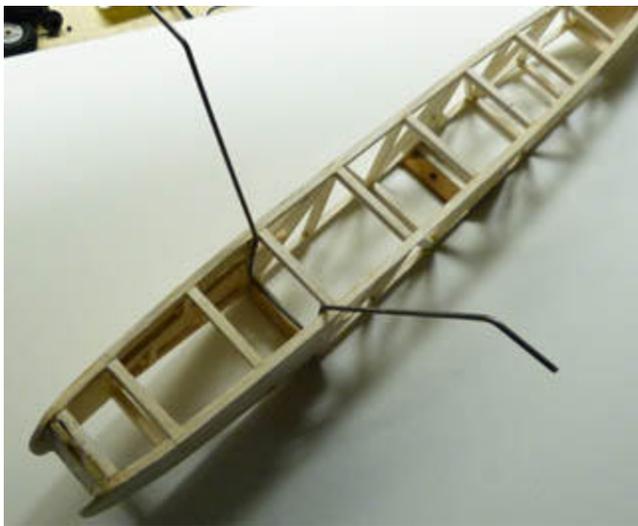


Now you can work on the wing hold down scheme which consists of a 3/16 dowel at the wing leading edge. I made a change on the final plans here and placed a 1/8 X 3/16 spruce spacer between the dowel and the bottom of the wing. This allowed the dowel to drop a little lower into the fuselage.

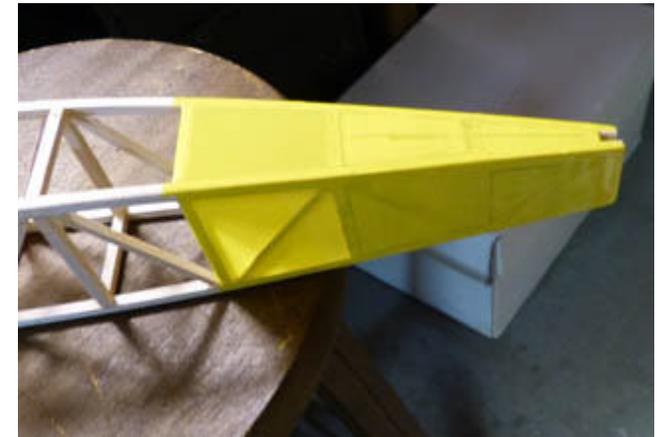
A 1/4-20 nylon bolt (DuBro #142) holds down the wing trailing edge. This bolt screws into a piece of 3/16 inch plywood. The hole for the bolt was threaded with a 1/4-20 tap. The firewall, F-1 comes next. The motor is held in place with four sheet metal screws.



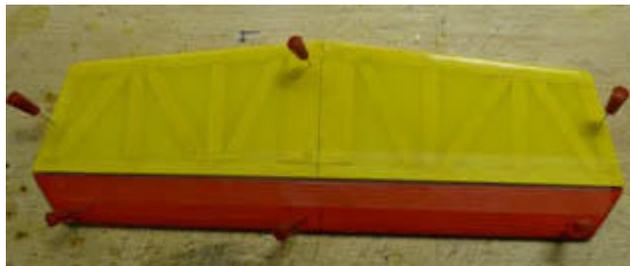
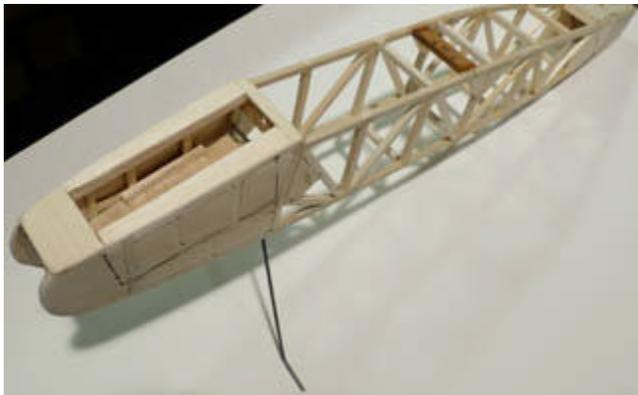
The next several photos show successive steps in construction. 1/16 balsa fill is added at the rear of the fuselage. The landing gear is made from 3/32 inch diameter wire. The battery box is fashion from 1/16 medium to hard balsa. Battery access is from the top. The battery pack is held in place with several rubber bands and two short lengths of 1/8 inch dowel.



At this point I covered the wing and ailerons. I used BP Hobbies SOLITE in opaque red and yellow. Because this is a stick model you might want to consider transparent covering instead of opaque. Control surface hinging was done with DuBro Electric Flyer Hinge Tape.



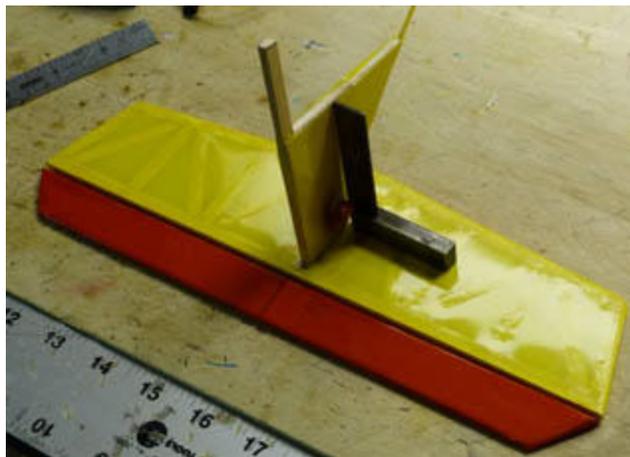
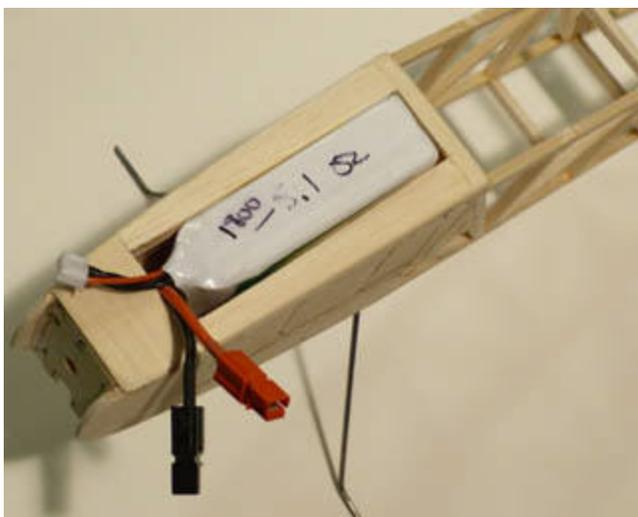
Cover the rear of the fuselage in the rear where the fin will be installed.

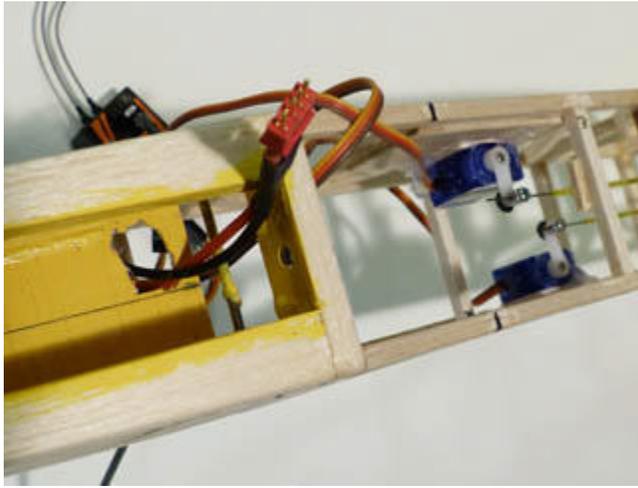


Here the elevator is hinged to the stab. The vertical fin is cemented to the stab using 5 minute epoxy. A small triangle makes sure that the fin and stab are at right angles.



Mount the fin/stab assembly to the fuselage. That spruce fin spar goes between the fuselage side at the rear. Make sure the wing is lined up with the stab, before applying the cement.



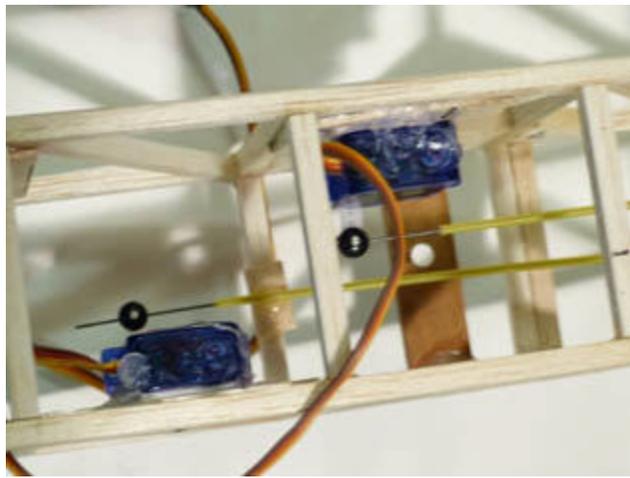


Mount the rudder and elevator servos at this time. Again use double sided tape along with the Permatex silicone adhesive.



The 22 amp ESC is attached to the underside of the battery compartment, just behind the firewall F-1.

A closer view of the rudder and elevator servos. Control rod wire is .025 inch diameter that runs inside the Stevens Aero Models .073 inch yellow Teflon tubing. All the hardware was supplied by DuBro and is noted on the plans.



The next photos are of the completed MIDIWATT-200, ready to fly at 14.5 ounces total weight.





To give you an idea of the size, I'm holding the MIDIWATT-200 in this photo.

FINAL CG and CONTROL THROWS

I've already discussed my initial nose heavy balance situation. The plans show my final CG location. But that was achieved with a slightly lengthened nose plus an added one ounce of lead in the tail.

You could move the firewall and motor rearward, possibly as much as 1 inch. By doing that most, if not all, of the lead weight in the tail could be eliminated. That would reduce the weight of the plane and make it faster in flight.

Then with some throttling back, you should be able to get about a 10 minute motor run time using the lightest weight battery, namely the 3 cell 850 mAh. The options are up to you.

Control surface travel was as follows: Aileron +/- 1/4 inch either side of the neutral position. Elevator +/- 3/16 inch either side and Rudder +/- 3/4 inch either side.

FLYING

This next photo shows Tom Hunt hand launching the MIDIWATT-200 on the first of the 6 flights we took on that first day at our SEFLI Club field in Calverton, on the east end of Long Island.



Interestingly, the other 5 flights were ROG (taking off the ground). That was a surprise because our field is very rough and the wheels on this plane are only 1 1/2 inches in diameter. With all the power available, it literally jumps off the ground.

We also found that with the large rudder we could easily taxi the plane, even without a steerable tail wheel. That big rudder also let us do some knife edge flying. So what you have here is a sport plane that is still capable of a lot of aerobatics.

After a couple of flights I added 25% expo rate control to both the ailerons and elevator. I also noted that the elevator control was somewhat "jerky".

To correct that I removed the control rod wire and pre-set it to the shape of the yellow Teflon tubing. This eliminated some of the control rod friction and made the elevator control much smoother. In fact when doing this you might spray a little WD-40 oil on the control wire. It also helps.

What follows are several flight photos.





SUMMARY

This was the third time that I built a Tom Hunt stick design and all three proved very successful. Keep in mind that my first MIDIWATT had 510 square inches of wing area and weighed around three pounds. It was powered by a brushed motor with a belt drive and heavy Ni-CD batteries.

My next two MIDIWATT's (100 and 200 square inches) were powered with modern brushless motors and Li-Poly batteries. Looking back now I just might consider re-visiting the MIDIWATT-510, but this time with a brushless motor and Li-Poly batteries.

The MIDIWATT stick design is really easy to build. This "200" version took me about a week. Actually I spent more time writing this article, taking the photographs and drawing the final plans, then I did building the model.

Another thing I would like to try is installing a set of twin floats on the "200" to allow it to fly off water. I just may do this for our 2016 NEAT Fair (next September 2016), where we have a pond nearby.

Keep the wing construction in mind. The bent strip concept can easily be applied to many types of model aircraft. It will save a lot of time since you have no wing ribs to cut out.

I might point out that Tom Hunt had built years ago a series of much larger versions of the MIDIWATT. He called these planes the MEGA-WATT. They were made available in a low wing variation, a mid-wing, a high wing and a biplane.

They had an average span of 80 inches, an area of 1,300 square inches and an average total weight of 8.0 pounds. These planes were powered by a very large brushed motor with an equally large belt drive system.

Tom still has the plans available for these "monster stick" designs. With a modern brushless motor along with Li-Poly batteries, these planes would be spectacular. He also has plans for the MIDIWATT-510, for those interested.

You can reach Tom Hunt at:
tomhunt@optonline.net

Bob Aberle
baberle@optonline.net

SPECIFICATIONS --

Model: "MIDIWATT-200"

Designed originally in 1996 by AMA Hall of Famer, Tom Hunt. The original had a 52 inch wing span and 510 square inches of wing area. For this presentation the design was reduced to a 32 inch span and 200 square inches of wing area.

TYPE --

A Park Flyer size RC sport design intended as an aerobatic trainer.

Wingspan: 32 inches

Wing Area: 200 square inches

Length: 25 inches

Weight: 14.5 ounces

Wing Loading 10.4 oz/sq.ft.

RC GEAR USED --

Horizon Spectrum DX-7 transmitter operating on 2.4 GHz, a Hyperion HP6RX receiver and four Hobby King HXT 500 5 gram micro servos operating the rudder, elevator and two on the ailerons.

POWER SYSTEM USED --

Innov8tive Designs Cobra brushless outrunner motor (2208-34), APC 7 X 5E prop, Innov8tive Designs 22 amp brushless ESC and a China Hobbyline 3 cell 850 mAh 30C Li-Po battery pack.

POWER SYSTEM PARAMETERS --

Prop: APC 7 X 5E

Motor current: 7.52 amps

Voltage: 11.51 volts

Power Input: 86 watts

Battery Loading: 8.8C

Power Loading: 94.5 watts/lbs

Flight Time: 7 minutes at full throttle

SOURCE) REFERENCES --

NOTE - WEBSITE LINKS ARE TESTED AT TIME OF PUBLICATION BUT OFTEN CHANGE OR ARE UPDATED - SEARCH GOOGLE IF A LINK DOES NOT WORK

Innov8tive Designs - Cobra brushless outrunner motor 2208-34 - 22 amp brushless ESC -

[Click to go to Website](#)

Aircraft World (Hyperion HP6RX DSM-2 compatible receiver)

[Click to go to Website](#)

BP Hobbies (CA cement, CA accelerator, Solite covering material, 5 minute epoxy cement and an APC 7 X 5E prop.

[Click to go to Website](#)

Callie Graphics (AMA license number decals)

[Click to Email Callie](#)

China Hobbyline (3 cell 850 mAh, 30C Li-Po battery pack 2.3 ounces)

[Click to go to Website](#)

DuBro --- 1.50 inch diameter Mini-Lite Wheels (#150MW), micro control horns, mini EZ connectors, electric flyer hinge tape and 3/32 inch wheel collars)

[Click to go to Website](#)

Hobby King (four HXT 500 5 gram micro servos)

[Click to go to Website](#)

Horizon Hobby (Spectrum DX-7 transmitter)

[Click to go to Website](#)

Stevens Aero Models (.073 inch OD Yellow Teflon tubing for the elevator and rudder control rods)

[Click to go to Website](#)



CARTOON FROM AEROMODELLEER MAY 1968

Aviation Museums To Visit A Photo Tour

Have you wanted to stop in aviation museums as you were “just passing by?” Me too. Here’s a website that lists hundreds of aviation related museums, and you can choose your own online visits - The photo below is from the Kalamazoo Air Zoo in Kalamazoo, Michigan.

I’ve been to the Air Zoo in Michigan and it is definitely worth the trip.

[LINK TO MUSEUMS](#)



Plans - Plans - Plans - If you’re like me you enjoy looking at plans, even though it takes time away from actually building models. After all, that’s one of the attractions of RCMW, the fact that we provide plans in every issue, unlike certain other model magazines which appear to be only used for advertising ARF’s and Drones.

There are many sources on the internet for plans, some for sale and others free. One of the better free sources is AEROFRED, the brainchild of Frederico Lopes (Fred) who lives in Portugal.

Fred accepts donations of plans from and allows them to be downloaded from his website at no charge. When you log on to the website it says there are over 19,000 plans available. They range from model airplanes to boats and articles of interest to modelers.

His website also has advertising but unlike some of the other sites it is not intrusive and doesn’t slow down the operation of looking for plans that you might be interested in.

Give AeroFred a try - The link is below

[LINK TO AEROFRED](#)



This movie clip has been floating around on the internet for quite a while but it’s still interesting to watch even if the “emergency” was probably a setup. Note--No parachute !!

The '13 Black Cats' were a company of flamboyant Los Angeles based stunt pilots who defied both superstition and the odds on survival at Burdette Airport, Los Angeles in the 1920's.

Gladys Ingle was famous for shooting arrows at a target while standing on the top wing of a Curtiss Jenny--and for changing planes in mid-air.

The Curtiss JN-4 "Jenny" biplane aircraft was built by the Curtiss Aeroplane Company in 1915. Initially used as a training aircraft for the U.S. Army, it became the backbone of American post-war aviation

[LINK TO MOVIE CLIP](#)

Notes on Printing Plans and Patterns by the Editor

On the next page is the plan for the Berkeley SINBAD THE SAILER, a popular and attractive 50 inch wingspan designed by Henry Struck in 1941. As it happens, we had the complete kit for that model including a decent set of printed wood patterns, so we decided to try to include the wood patterns along with the plan.

The patterns are shown full size on the 4 pages following the plan. Because they were too large to appear on a single letter sized sheet we split them up so the sheets could be joined together.

This was a common practice in model airplane magazines particularly back in the 1930's and 1940's. In many cases plans or patterns would be printed on separate pages that had to be joined together. That's probably why it is more difficult to find these older magazines the don't have pages missing.

Depending upon the care taken with those old multiple sheet plans and patterns, they might be able to be easily reassembled and sometimes not. Often they would be missing information along the edge of the sheets or would even be slightly different scales, making joining them together an exercise in futility at best.

Even though computers can be frustrating at times, they do allow us to do things that were much more difficult before. In this case we have provided the printed wood patterns on four pages along with "targets" that allow the pages to be readily assembled.

Just print out the four pages at either 100% of scale. Some printers allow setting the scale as a percentage of full size but with others full size is called out with a setting of "Scaling = None" You will get four pages that can be easily joined together.

First trim the edges to be joined to the red borderline and using a common pin just punch a hole in the center of the respective "targets" in each corner. The using the pins to align adjacent sheets, pin them down to your worktable and tape them together. We have allowed for about a quarter inch of overlap on each sheet so as long as you don't remove the targets you should get a perfect set of patterns.

You can even check if the scale is right because the targets should measure 7.5 x 10.0 when printed correctly.

Many printers come with software that allows what is called "tiling", which means that a large sheet can be printed on smaller pages, sometimes with index marks and sometimes not. This works also but the "target" method seems easier and more reliable. We will probably try the same method in future issues when plans or patterns seem well suited to this approach.

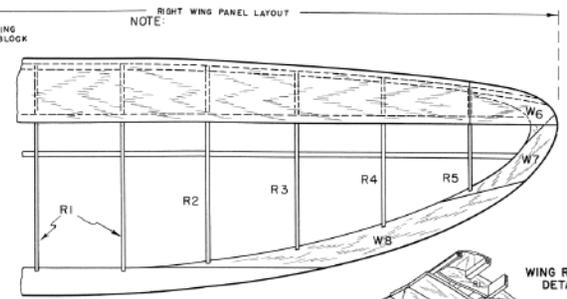
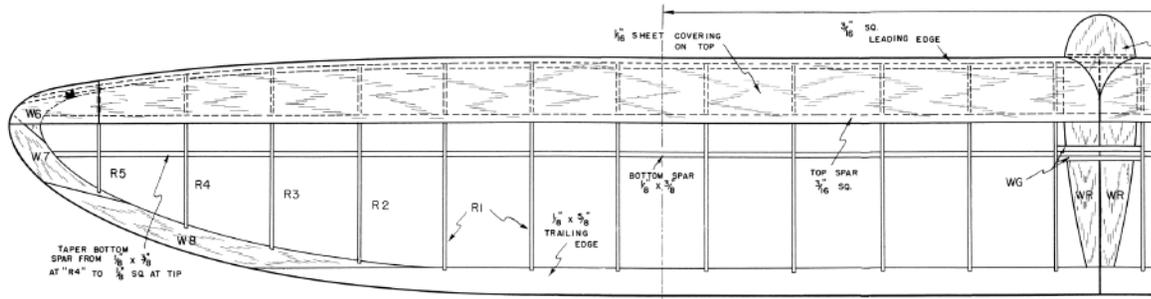
A lot of times the plans survive but the patterns end up lost because the kit manufacturer doesn't include all of the patterns on the printed plans. By scanning the wood and making a duplicate set of printed patterns this information can be preserved.

To use the printed pattern sheets, you can use a spray photo mounting adhesive on the back of the printout, cut it out with a scissors or knife, and stick them either directly to the wood to be cut out or to template material if you may want to build another or repair the model later on. 1/32 or 1/16 inch plywood makes a good template material for future use and the fibreboard from the back of a tablet works well for occasional use.

I have sometimes used .030 thick aluminum for templates, especially if they will be used to cut a lot of identical parts such as wing ribs for a straight wing.

Give it a try and let us know what you think.

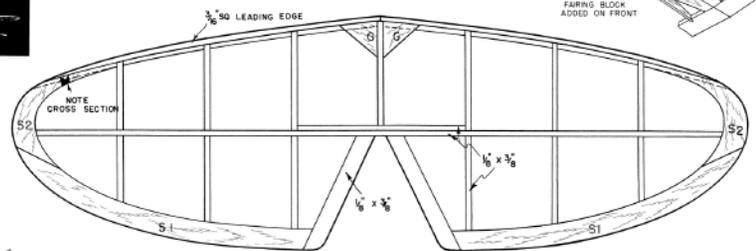
Roland Friestad - cardinal.eng@grics.net



NOTE: BUILD RIGHT WING USING THIS AS CENTER

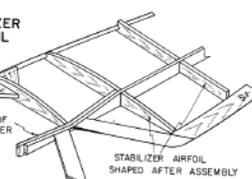
WING

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STABILIZER

NOTE TAPER OF SPAR AT CENTER SECTION



DIRECTIONS FOR BUILDING & FLYING

Observe the builder has all the measurements that are deducible in a model glider. By using the "spiral control" system all-time can be reduced and the glider will fly better. The spiral control affords the ease of the glider during the launch and results in a steady glide without the danger of the glider falling off to the left or right and into the ground. When the glider is launched to its flight on the line will permit the spiral control and the glider will fly better. The spiral control is a new development of the model glider.

FUSELAGE
The basic frame of "fuselage" of the fuselage is built up of 1/8" balsa. For the landing on the top view of the glider and trace the shape and connect together along the side view line to a glider.
It is not necessary to remove the wood to proceed with the fuselage construction. Add frames B1, B2, and B3 to the center. Also remove the ball from the side view and connect it in place on the ground. The 1/8" sq. spruce are cut to approximate length and are cemented to the center on the back. When the center is added, the glider should be cemented to the center line. A 1/8" x 1/8" sq. strip of balsa is added to the ball after the rest of the fuselage has been completed.

After cementing the center from the plan with the remaining fuselage frame, the side top (T1) and then the 1/8" sq. top stringer are cemented in place. Cement the remaining stringers in place and cover the wood with sheet balsa. The 1/8" sq. top wire on the ball will be easier to get on after it has been cemented in place. The ball is in place is cemented in place in the center that they are cemented. The center block is cemented in place on the ball after it has been placed it can be removed. The other blocks are cemented permanently to the fuselage, aligned straight with a ball, and centered. Cement frame pieces to the fuselage and make it hold on the wing and tail.

WINGS AND TAIL
Cut the ribs and wing tips from the printed sheet. Cement the top sections together and to the trailing edge. The trailing edge is shaped as a ball in a 1/8" sq. strip of balsa and cement in place. The front of the trailing edge is shaped as a ball in a 1/8" sq. strip of balsa and cement in place. The ribs are cemented in place on the ball after it has been placed it can be removed. The other blocks are cemented permanently to the fuselage, aligned straight with a ball, and centered. Cement frame pieces to the fuselage and make it hold on the wing and tail.

RUDER
The rudder outline is cut from the printed sheet and cemented to the glider on the plan. The large hole section of the rudder is raised in a file section and tapered to adjust the form of the glider.

COVERING AND ASSEMBLY
Apply the covering carefully to cover any gaps that might appear in the finished appearance. Start joining the covering to the ribs at the top of the wing and the leading edge of a glass appearance is desired. The bottom of the wing and the tail should be covered in the same manner. The covering should be applied in a little margin for overlapping. When the covering is applied, water and oil should be used to keep the covering tight and cemented to the fuselage before the glider. Cut away the top surface to fit the glider's ribs.

SPRINT CONTROL
Taper the stick so that the "Spiral Control" member is offset about 3/8" towards a left turn. The holes may be filled with three sets of small wood blocks, when the glider is held in a horizontal position, the spiral control should fall off by its own weight.

The position of the ball on the stick may be altered by fastening it in a hole and use another hole. On wing member near the fuselage frame on the stick and it will be easier to use.

The spiral control member being offset to the left indicates the glider's rudder which is offset to the right. Therefore when the glider is being held it will not appear to be with control. When the glider has reached the highest altitude the ball will permit you gradually and smoothly and without shaking fall off and the glider is released. The spiral control is now no longer controlling the "right control" so the glider will return to the right giving a greater possibility of soaring.

FLYING
Put the ball on with wire or any other suitable weight until the wings balance and is horizontal when supported on each side by fingers at the same level. The ball will be cemented to the glider to hold it in place. The spiral control is held on and the glider gently held into the air. The spiral control is held on and the glider gently held into the air. The spiral control is held on and the glider gently held into the air. The spiral control is held on and the glider gently held into the air.

TOWLINE GLIDER "SINBAD THE SAILER"
DESIGNED BY *Henry Stock*
EQUIPPED WITH "SPIRAL CONTROL"
WING SPAN 50 INCHES
WING AREA 250 SQ. IN.
WEIGHT 5 OZ.

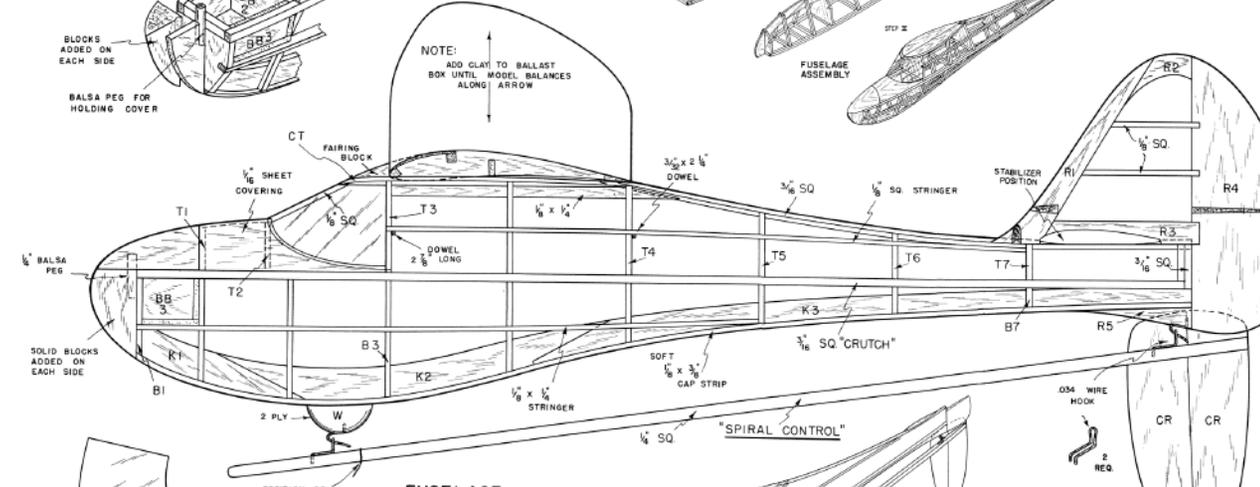
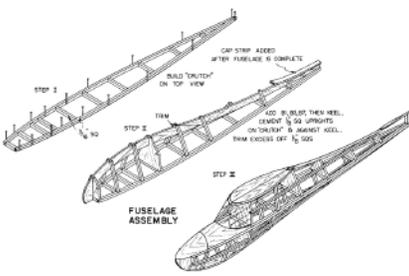
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END GRAIN DRAWN BY *Joe Minner*

FRONT VIEW

NOSE DETAIL

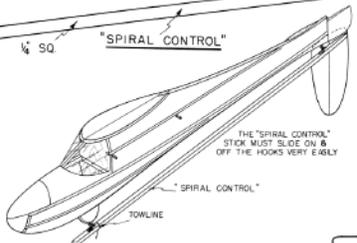
ACTUAL PHOTO OF FINISHED MODEL

NOTE: ADD CLAY TO BALLAST BOX UNTIL MODEL BALANCES ALONG ARROW

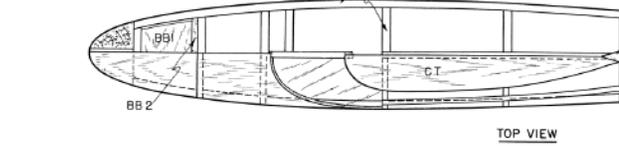
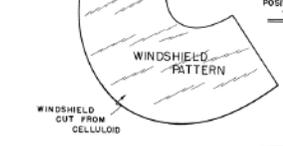


FUSELAGE

NOTE: FUSELAGE UPHOLSTERS ARE 1/8" SQ EXCEPT WHERE NOTED OTHERWISE (SEE FUSELAGE DETAILS)



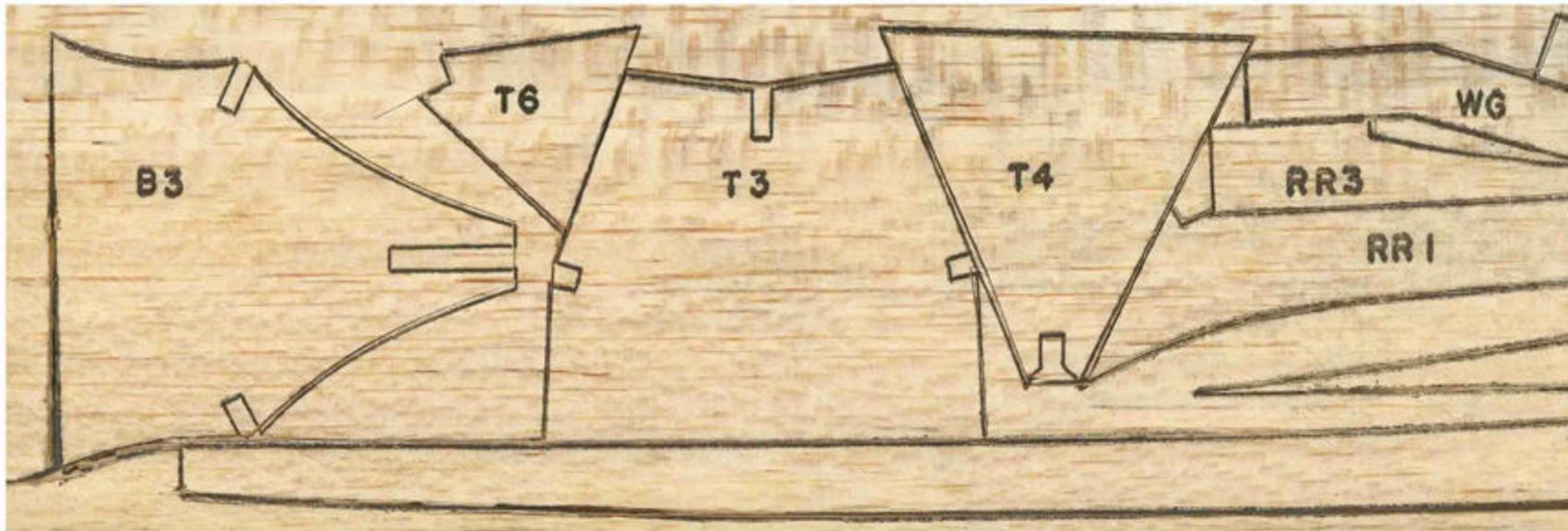
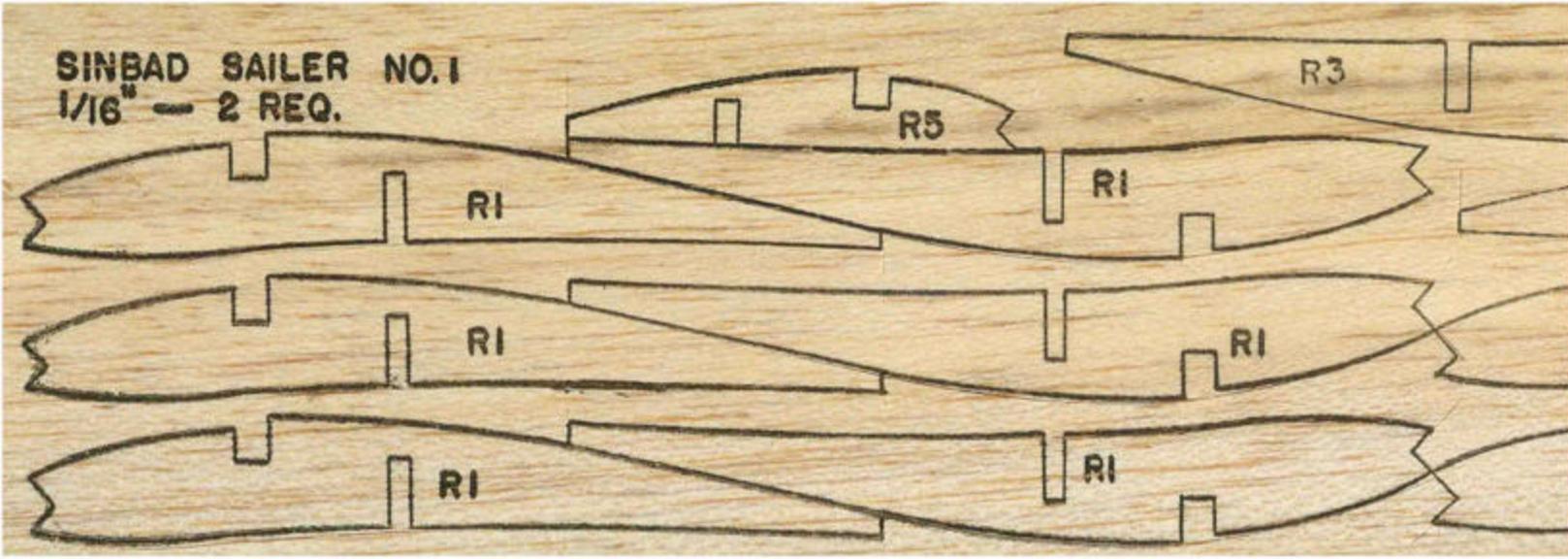
TOP VIEW

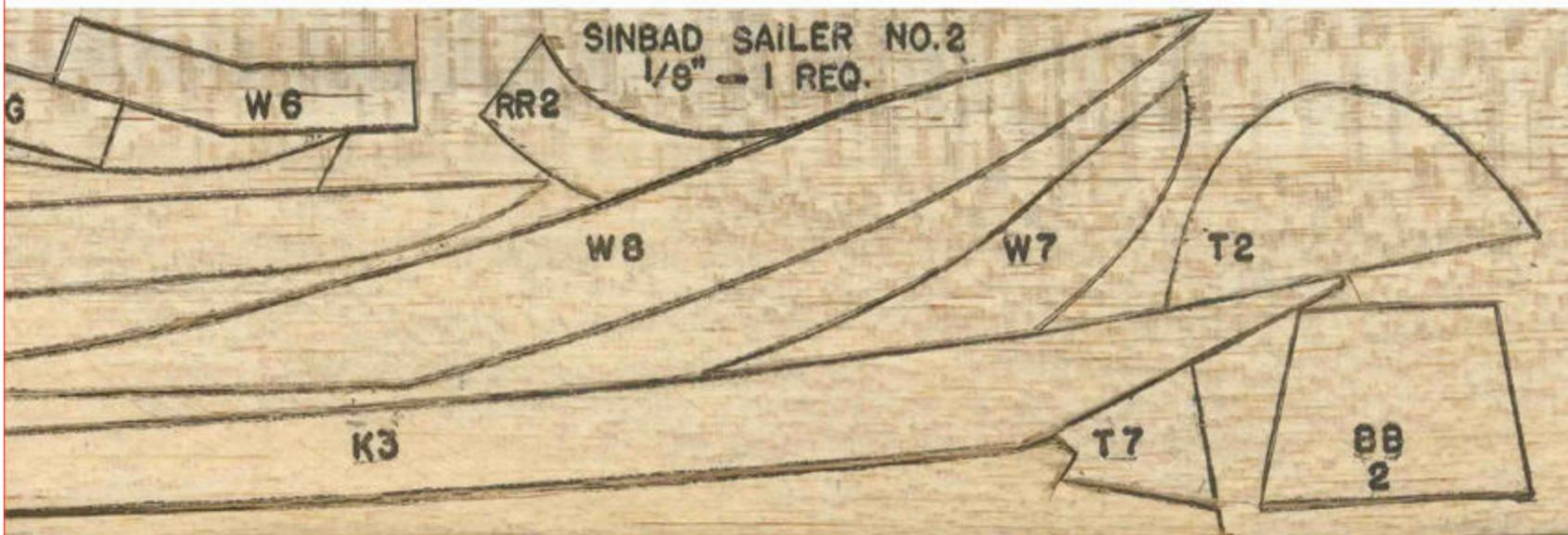
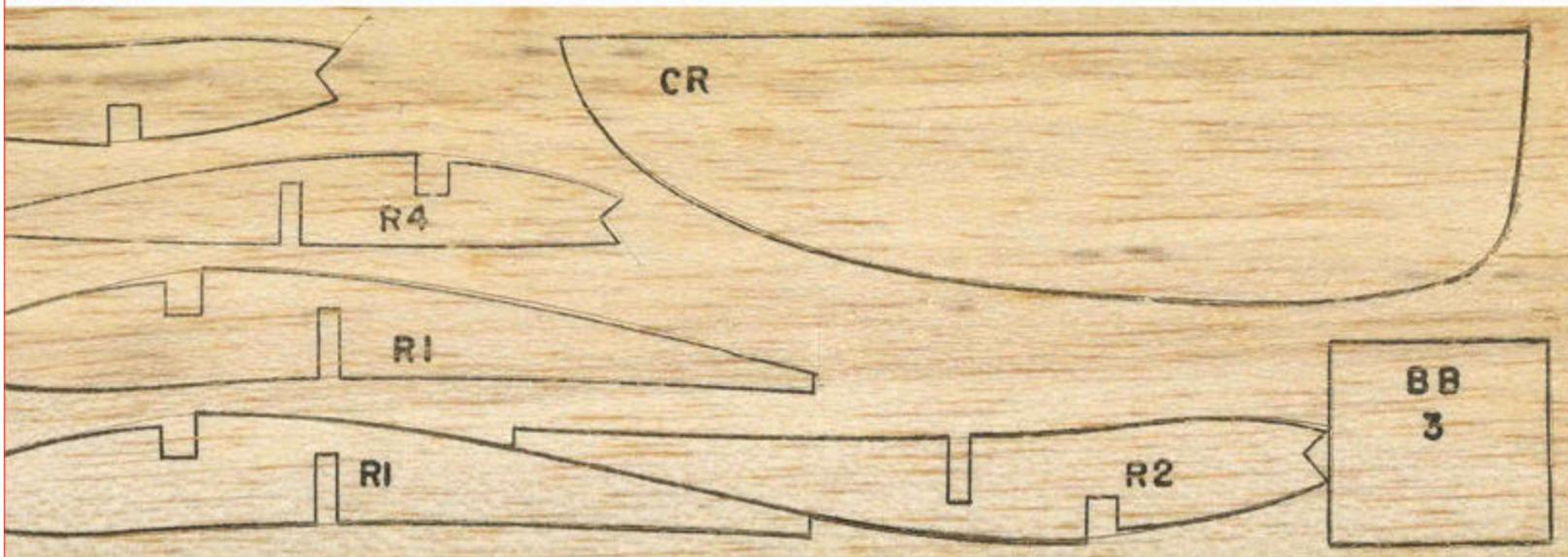


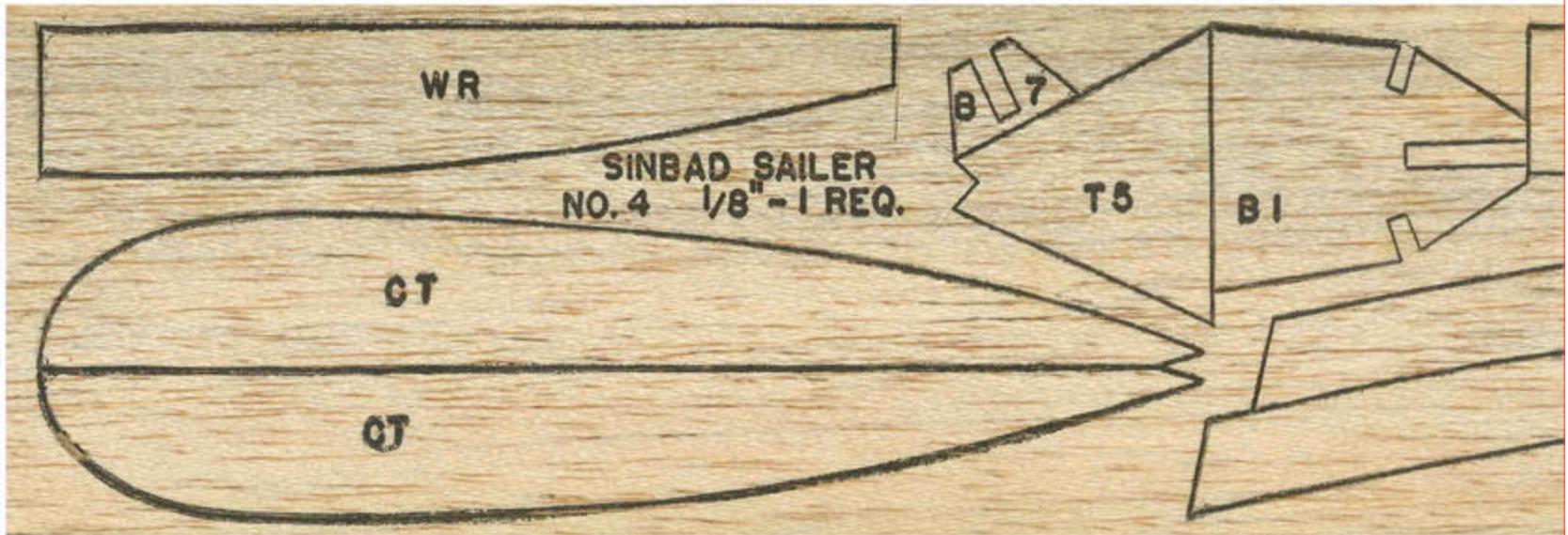
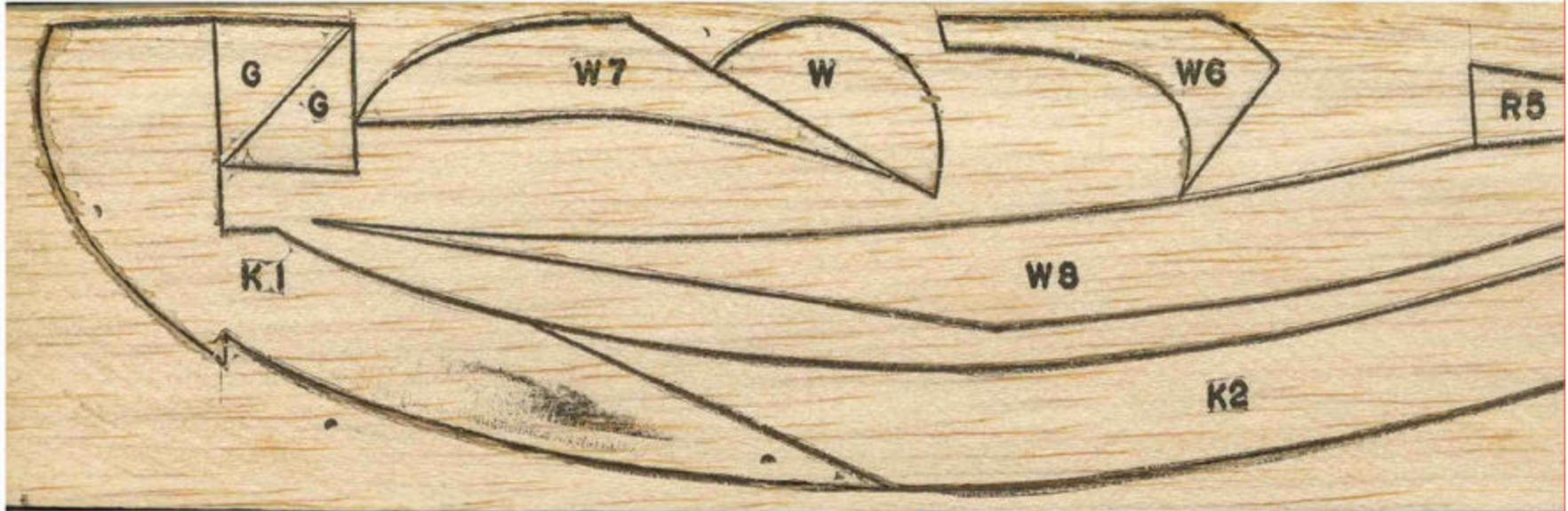
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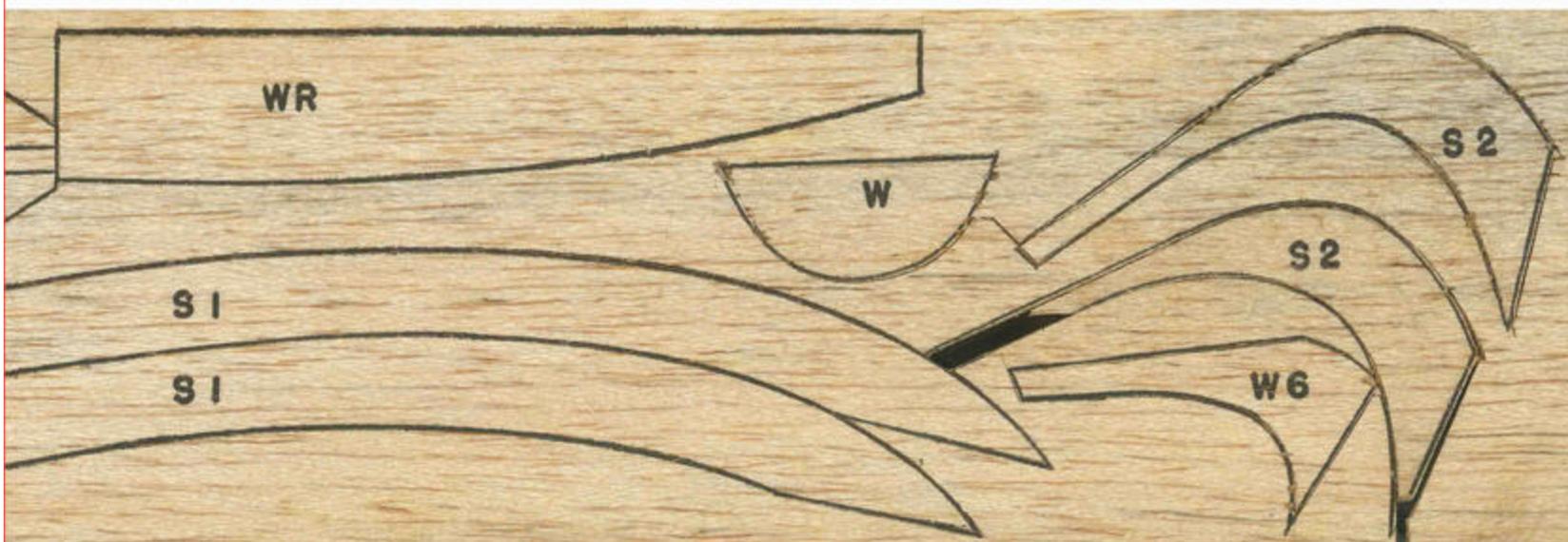
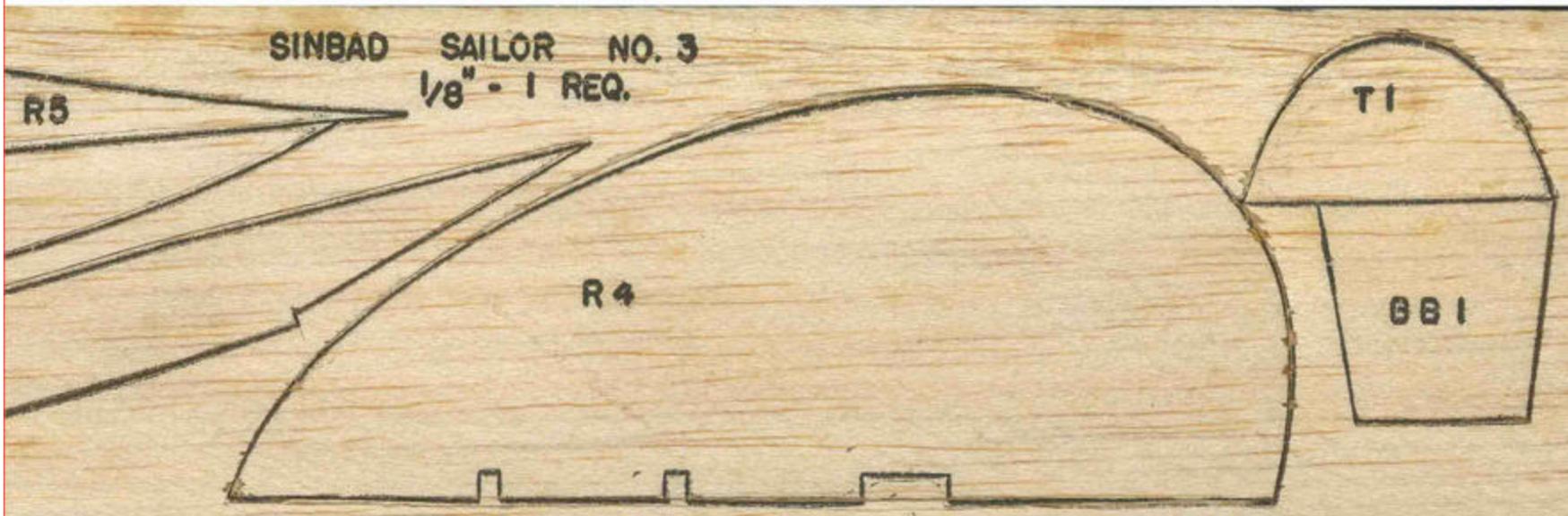
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SINBAD SAILER NO.1
1/16" — 2 REQ.









Cessna L19 BIRD DOG



This Half A scale FF model by Eric Fearnley is from the pages of the December 1954 issue of Aeromodeller

THE L-19 BIRD DOG (Cessna 305) was chosen for a flying scale model because it appeared to be a "natural" for modelling.

This has been proved true of our prototype, which combines the aerodynamic proportions of a flyer of inherent stability with the ruggedness of the sport model, yet retaining a true scale appearance with very simple construction.

If this 'be your first scale effort, you have an ideal model, capable of being flown in a small field, in all but the roughest conditions, with the best possible chance of keeping it in one piece over a long period of flying activity. The prototype has had some months of flying, and to date, no repairs, major or minor, have been executed on it, and it retains its new appearance.

Any of the modern .5 c.c. engines can be used. Ample power will be available, and it is suggested that a rather larger prop than usually employed On this size engine will make for scale flying appearance, and also simplify trimming. A 7 in. by 4 in. should replace the normal 6 in. by 4 in.

Start construction with the Fuselage by cutting out two sides from medium 1/16 in., matching them for strength to simplify later assembly. The formers are cut from 1/8 sheet balsa, except F3, F4 and F5, which are from light plywood. Form the undercarriage as shown, and sew to the ply former F3.

Assemble the ply formers on the sides and when true and dry, add F1, F6, F7 and F8. Fit the 3/16 sheet pieces under the motor mount, and make sure they are parallel with the thrust line.

Cut out the motor mount to suit your engine, and cement this in place, adding the 3/16 upper pieces, hollowed bottom, nose, and the tail-skid blocks. When dry, carve to final shape, and sand smooth. Make the detachable cowl top from laminated 3/16.

Cover the rear of the fuselage with pliable 1/32 sheet. Avoid hard, brittle wood. Cover the bottom using strips at the front end where compound curves are indicated, and in one piece at the back. Steam if any trouble is experienced.

Root ribs F9 and dowels are added, making doubly sure that the incidence is true, and then add celluloid, window frames, and tube to take struts for wings, etc.



The Wing tapers from the halfway mark, so it is best to assemble in two stages—the root, straight section, and when dry, the tapered tips. The cutout spar shows this change in taper. When removed from the building board, fix the strut fasteners, make the struts from dowel and sand smooth.

Nothing could be simpler, than the flat plate Tail surfaces. Small trim tabs are an aid to trimming to allow for small errors in setting the tail incidence.

Cover the fuselage with lightweight and the wing and tail with heavyweight tissue, using sanding sealer on the fuselage and two coats of clear on the flying surfaces. Cement the tail surfaces in place after covering. European Bird Dogs are khaki with white lettering while those in the U.S A. are aluminium with black letters.

Trimming should be easy, but don't be careless with it. Balance where indicated, after fitting motor with outside holes to allow side thrust to be adjusted. A small washer should be placed under the back of the motor lugs for temporary down-thrust. If a sharp left or right flight is indicated, apply sidethrust to correct, leaving the rudder alone at this stage.

After a power flight, watch the glide. Too steep a glide is caused by not enough longitudinal dihedral—in other words, put up the tail tabs a little. If a stall follows this on power flight, add downthrust. Alternatively, a stall on the glide calls for the reverse—less tail tab angle, and less down-thrust if it is not climbing on power. The original model is so foolproof that it has been flown with many different trims, and with engine sidethrust either way.

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Cessna Bird Dog

DESIGNED BY
ERIC FEARNLEY

NOTE: POWER TRIM 1 SMALL WASHER UNDER REAR ENGINE LUG HOLES

TOP COWLING DETACHABLE CARVE TO SHAPE FROM 1/4" SHEET LAMINATIONS

ALLISON DART SHOWN

BALSA BLOCK HOLLOW OUT TO SUIT ENGINE

1/4" SHEET LAMINATIONS FUSELAGE SIDE

FUEL TUBE FOR DRAINING

FAIR LUG WITH ALUMINUM PAPER

COWL DETAIL

1/4" SHEET ABOVE & BELOW MOUNT

1/4" PLY ENGINE MOUNT

CUT TO SUIT TANK

COVER TOP OF CABIN WITH CELLULOSE & PAINT TO SIMULATE WINDOWS

1/4" SHEET TIPS

1/4" DIHEDRAL AT TIPS

1/4" X 1/4" T.E.

HARD 1/4" X 1/4" WING SPAR

BALANCE MODEL AT MAIN SPAR

F9 FROM 1/4" SHEET

1/4" X 1/4" STRIP

1/4" SHEET

| SHEET BALSA 3" X 36" | | MATERIALS REQUIRED | |
|----------------------|------------------------|------------------------------------|------------------------------------|
| 1 | OF 1/4" | 6" X 8" OF 1/4" PLY | 2 1/2" X 3" OF 1/4" PLY |
| 2 | - 1/4" | 1/2" X 2 1/4" X 2 1/4" BALSA BLOCK | 3/4" X 2 1/4" X 2 1/4" BALSA BLOCK |
| 1 | - 1/4" | 3/4" OF 1/4" DIA. DOWEL | 1/4" X 1/4" X 1/4" DIA. DOWEL |
| 1 | - 3/4" | 12" - 20 SWG. PIANO WIRE | 4" - 18 - - - |
| 1 | - STRIP BALSA 36" LONG | 4" - 16 - - - | 18" - 14 - - - |
| 2 | OF 1/4" X 1/4" | 4" - 16 - - - | 18" - 14 - - - |
| 1 | - 1/4" X 1/4" | 18" - 14 - - - | 18" - 14 - - - |
| 1 | - 3/4" X 1/4" | SHEET OF CELLULOSE | 2 WHEELS 1 1/2" DIA. |
| 1 | - 3/4" X 1/4" | | |

1/4" X 1/4" SPAR, TAPER TO 1/2" X 1/4" AT TOP FROM TOP RIB

RIBS 1/4" X 1/4"

1/4" SHEET L.E.

1/4" X 1/4" TRIM TAB

1/4" SHEET TOP

BALSA BLOCK

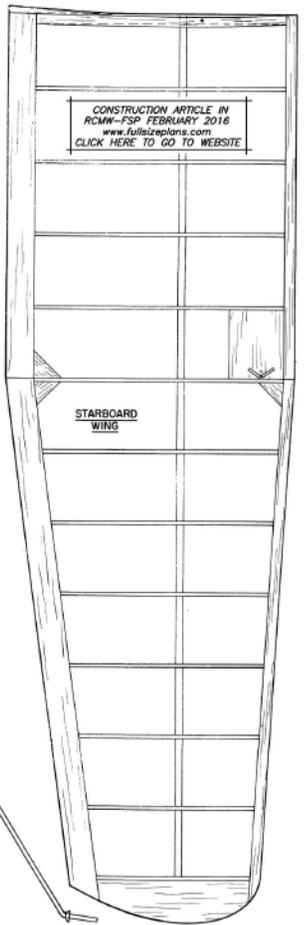
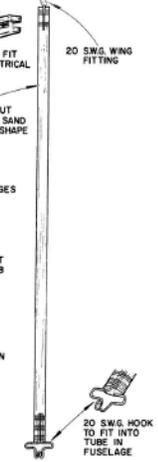
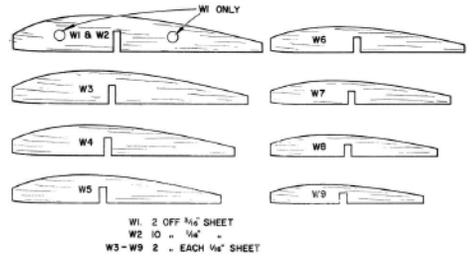
16 SWG. WIRE TAILSKID BIND TO BLOCK

1/4" X 1/4" STRIP

1/4" SHEET

1/4" X 1/4" STRIP

1/4" SHEET



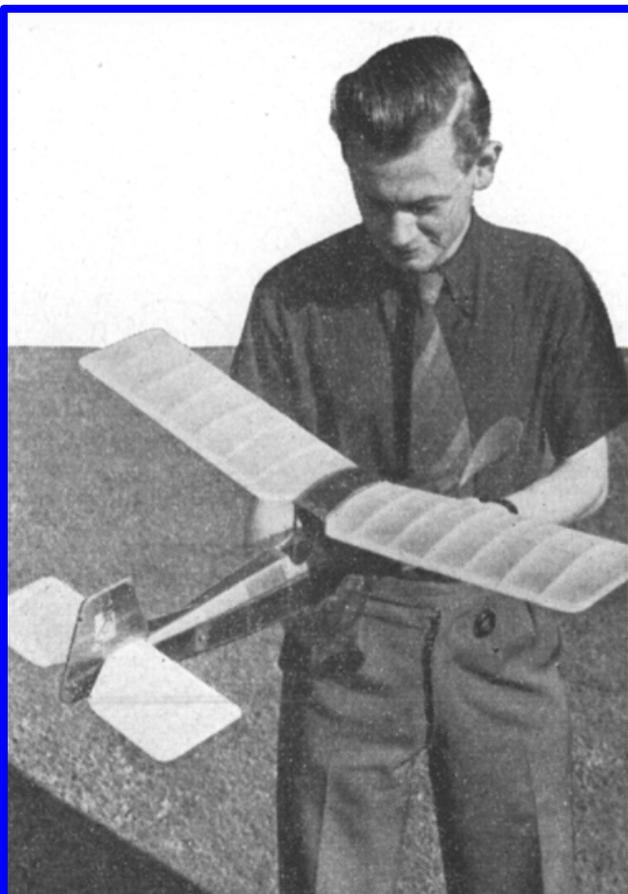
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ORIGINALLY PUBLISHED IN AEROMODELLER, DECEMBER 1954

PLAN FROM THE DAVE SHIPTON COLLECTION

PUBLISHED AEROMODELLER DECEMBER 1954 [FSP 368]

[CLICK HERE TO DOWNLOAD THE FULL SIZE PDF FILE](#)



RUBBERDUB

Brian Lewis designed this little rubber powered sport FF. Published in *Aeromodeller's* December 1954 issue.

REPRESENTATIVE Of a class of aircraft quite popular in the 1930's "Rubberdub" makes a change from the usual run of high wing sport models and is quite an attractive proposition for beginners or expert.

Its semi-scale lines with simple parasol wing mount and use of a standard 10-inch Obeche commercial prop make it ideal for a "one design" club contest where everybody is required to build the

same model and with all club members working on the same basis, a lot can be learned from the different approaches to flying trim.

"Rubberdub" is a small-field flier with average duration hovering around the 90-second mark to give a maximum of fun per flying hour.

Commence by building two basic Fuselage side frames flat on the plan, one over the other. When dry join together, using Former F3, and pulling together at tail then inserting Formers F2, 4 and 5. Insert spacers at nose and add F1. Fit 3/32 sq. stringers and add 3/32 sq. spacers on bottom and the decking. Sew 18 g. cabane struts in place.

Bind undercarriage and tailskid where needed and apply cement liberally. Add sheeting and gussets. Bind 18 s.w.g. wing mounts in place with fuse wire and solder. Note that the strut fairings are not added until after covering. Mark cockpit on sheeting and cut out carefully.

Start the Wing with the leading edge, cement 1 mm. ply brace in position. Pin one leading edge to plan, add trailing edge, trips, ribs and spar in that order. Remove from plan and "rock" the assembly to build the other half, and then "neutralise" back for centre section to be flat on plan and add trailing edge and 3/32 sheet brace to spars.

Reinforce trailing edge joints with pins. Cement riblets in place after sanding. Pin tailplane leading edge to plan. Add tips, gussets, 1/16 in. sheet at centre, 1/16 in. x 1/8 in. rib strips and 1/8 in. sheet ribs. Cement 3/16 in. x 1/16 in. spar in place on top of lower rib strips and then add 1/32 in. x 1/8 in. rib strips. These are best cut slightly oversize. Cement to trailing edge and spar first, bend over to leading edge, cut to correct length and cement.

The Fin is built flat on plan from 1/8 sq. and 1/8 sheet. Carve the nose block from hard balsa and

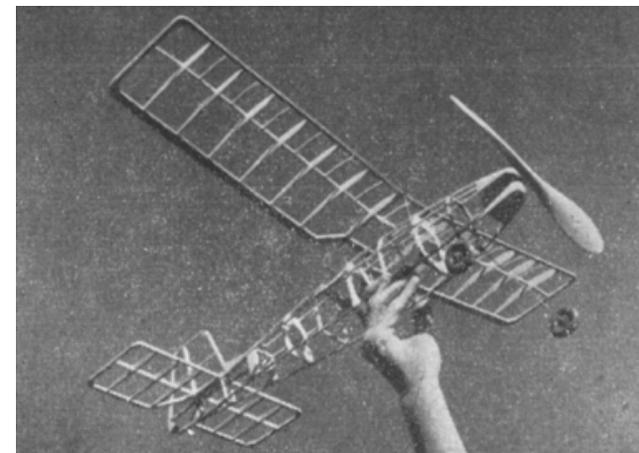
sand to shape while in place. Drill and fit brass brush and complete the prop assembly. Note that the rear cup washer is soldered to the shaft.

The fuselage should be covered with light-weight Modelspan and given two coats of dope. Wing and tail are best covered in Jap tissue and given one coat of dope. After covering, the cabane strut fairings, 1/8 sheet fin strake, 1/8 sheet tailplane key and windscreen can be added and the fin can be cemented to the tailplane.

Flying

Balance model under main spar, plus or minus 1/2 in. Trim for glide by adding packing under tailplane, approach maximum turns carefully, adding down-thrust if necessary. Properly treated the motor will take 1,200 turns, plus 100 turns for pre-winding which will give flights of 90-120 seconds.

If greater durations are desired the designer recommends using a balsa prop carved from a 1-1/2 x 1 x 12 block, powered by six strands of 3/16 x 1/24 rubber strip 30 inches long. This, however, will necessitate a slightly longer undercarriage to give the necessary ground clearance.



Back Issue
MAGAZINE ARCHIVES
By Roland Friestad

Here's the next in our monthly complete magazine available for download to subscribers. The October 1956 issue of FLYING MODELS contains model plans, how-to-do-it articles and lots of those ads that make us wish the prices on kits, engines and supplies were still what they were 60 years ago.

The cover painting is by Gil Evans who also was one of the authors and artists who drew the Fixit Wright series, one of which appears in this issue as well.

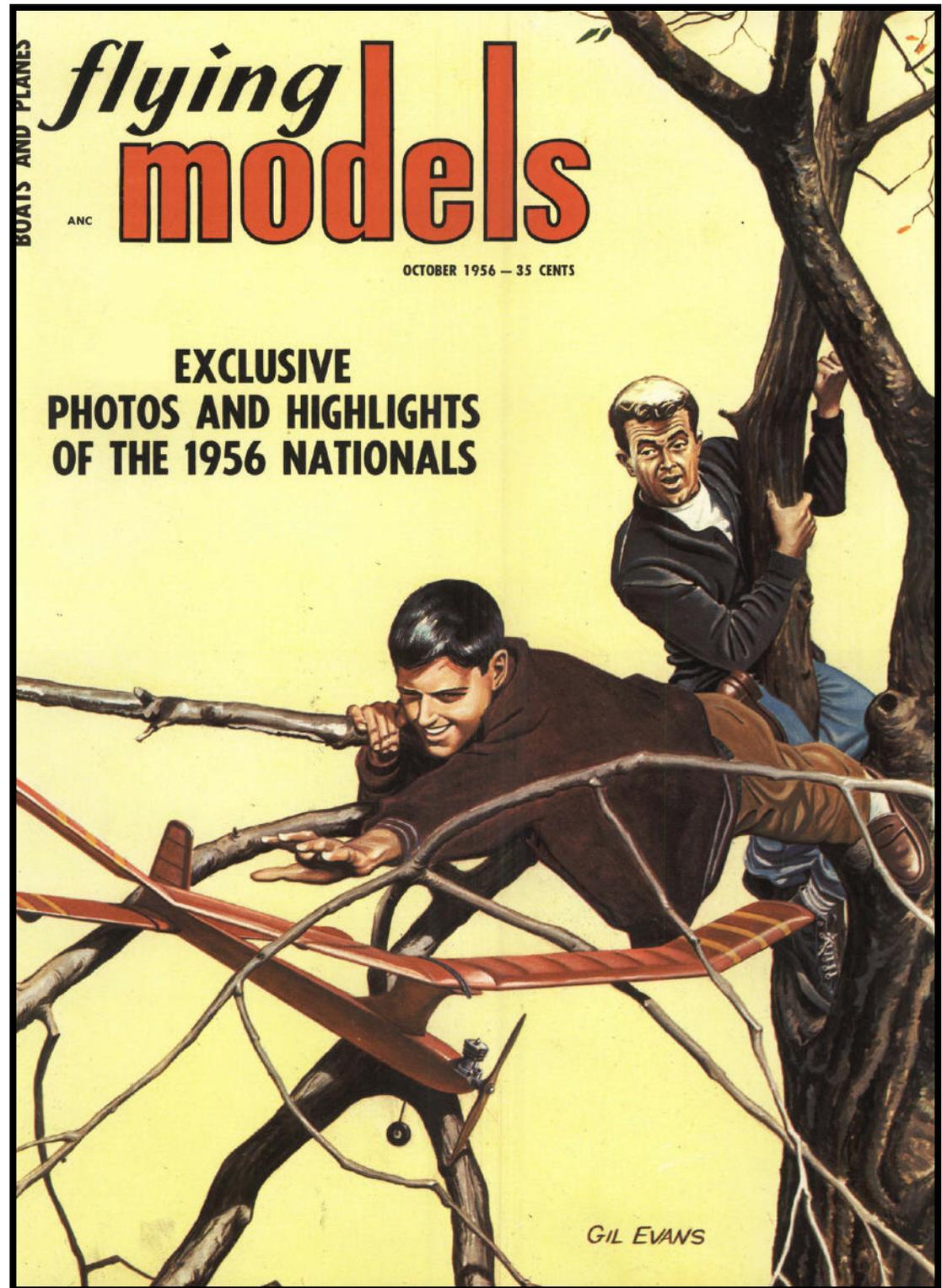
The name FLYING MODELS first appeared in June of 1947 and was advertised as including the magazine FLYING ACES and proclaimed the "19th year of publication" Looking back at other magazines of the time, it appears that there was a sort of competition between them to be able to claim that their particular magazine had been in publication the longest.

Just go to the following link and click on the download button that after a short time will appear in the upper right corner of your browser screen. The issue will be downloaded as a PDF file and you can read or print out any or all of the pages as you choose.

[-- CLICK ON THIS LINK PLEASE --](#)

This download link will be expire on May 1, 2015, so if you'd like this issue for your own collection, better do it now.

As a note of interest, this issue is stored in the "cloud" that you see mentioned as one of the latest of the buzzwords used by the computer folks. I use a service called Mediafire which can easily handle very large files that would otherwise cause problems with downloading.

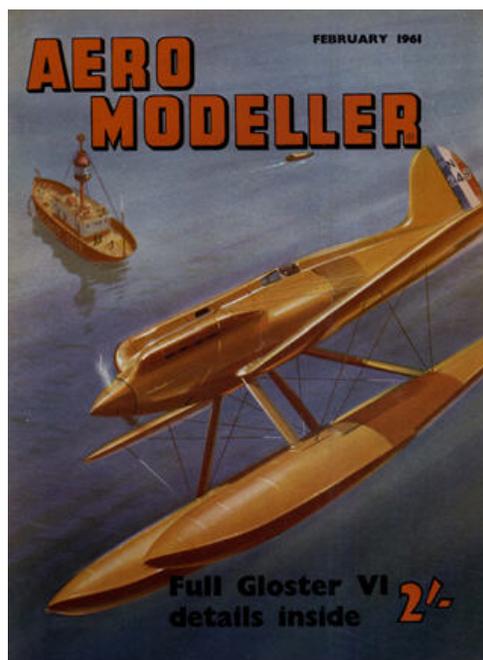
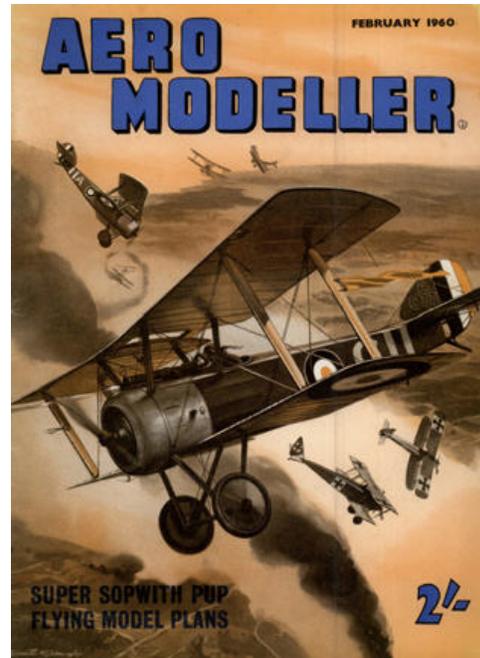


At Last! - The first batch of the AEROMODELLER digital collection. All 240 copies from the 1950's and 1960's. Now working on 1935 through 1949 - Vol 1 No 1 cover below.

To get the 1950's-1960's set, send \$75US via PayPal to cardinal.eng@grics.net - For Check or money order send to Roland Friestad - 1640 N Kellogg Street - Galesburg, IL 61401



Cover from Vol 1, No 1 - Nov 1935



Back Issues 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.

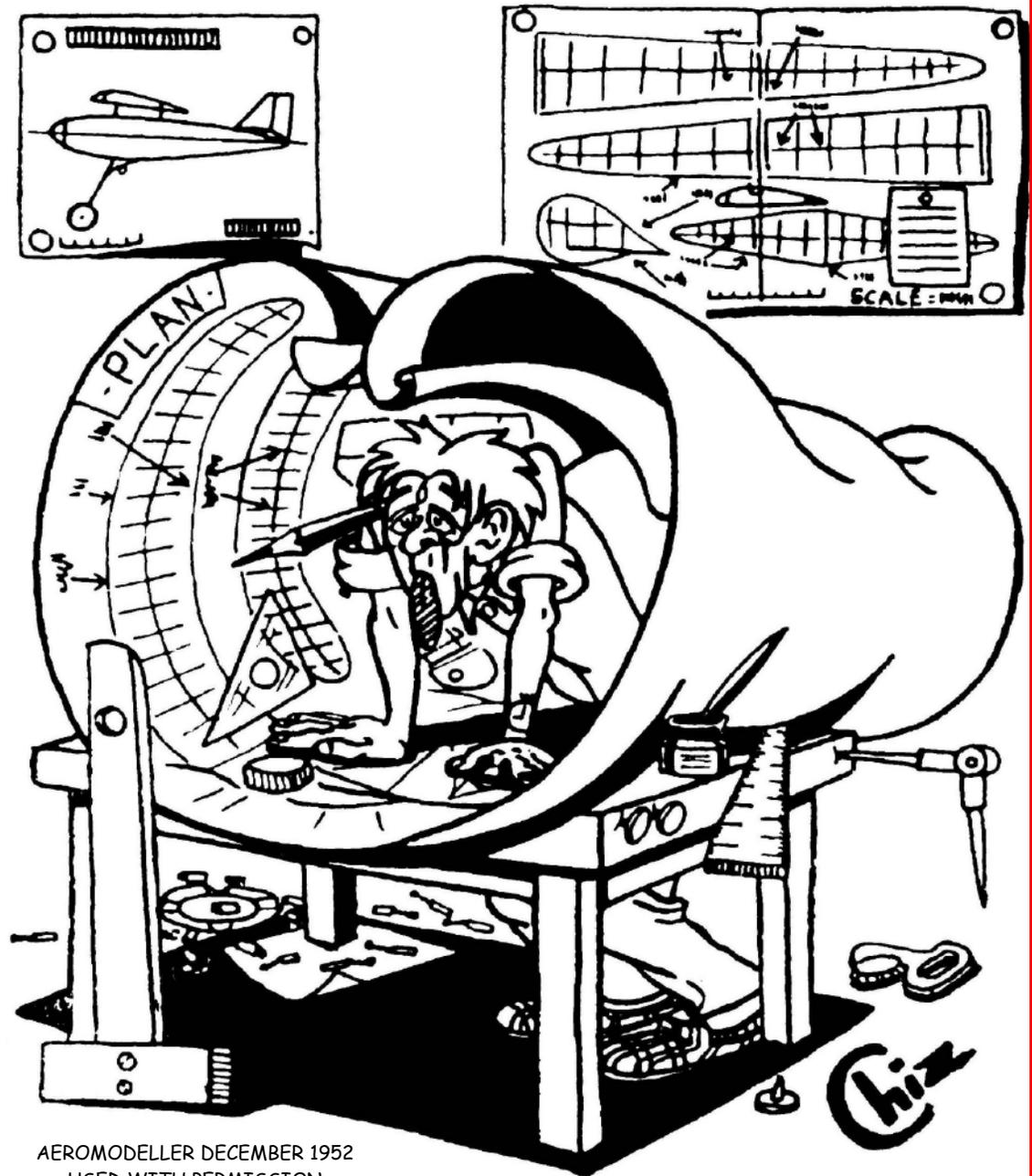
That's NOT the way it was in the past, when you had to build a model before you could fly it. If you're an old-timer, as I am, you have fond memories of Air Trails, Flying Models, Model Airplane News, Aeromodeller and many of the several other magazines available "way back when".

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

All collections are furnished on custom USB Flash Drives

AEROMODELLER is now available !! - 240 issues covering all of the 1950's and 1960's - \$75US via PayPal - Postage Paid worldwide. See page 31 of this issue of RCMW

More to come including MODEL CRAFTSMAN, FLYING ACES, POPULAR AVIATION, MODEL AIRCRAFT (British) Watch this space.

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 being published. 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

NEW - Now available is a digital collection of the first 10 years of RC Modeler magazine, starting with the first issue published in October of 1963 through the issue of December 1972 - 109 issues in all on a single USB drive card. -

\$50 - Postage paid world wide

All prices include postage paid worldwide

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