

MAXFAX



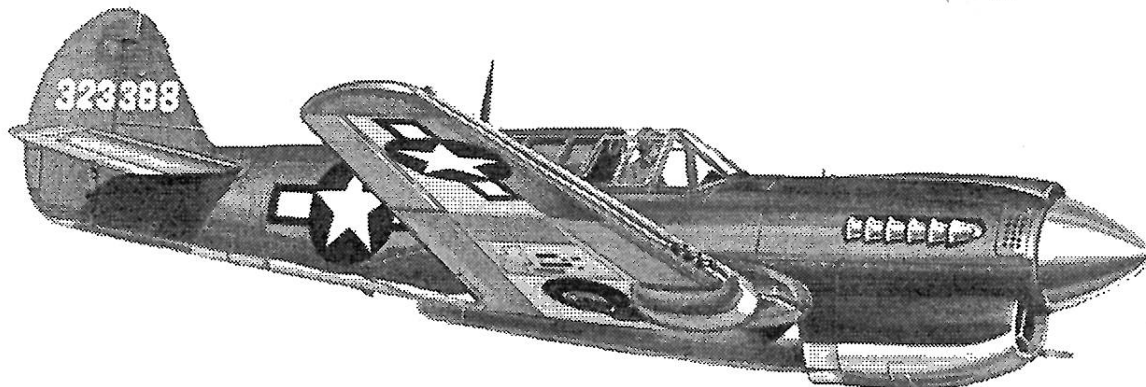
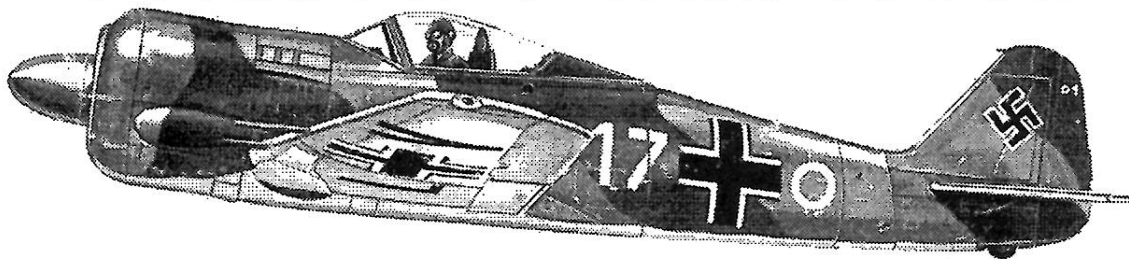
Journal of the D. C. Maxecuters

... home of the dreaded POTOMAC PURSUIT SQUADRON of the Flying Aces Club

Editor: Stew Meyers

MAY - JUNE 2001

GUILLOW'S WW2 ISSUE



COMING ATTRACTIONS

- MAY 12 2001** 2001 EMPIRE STATE INDOOR CHAMPIONSHIPS AT BUFFALO BILLS FIELD HOUSE
Contact Bob Clemens for info -- 716-392-3346 --email --robert.clemens@worldnet.att.net
- MAY 19,20 2001** BRAINBUSTER'S SPRING FF MEET INCLUDING FAC AT PETERSBURG, VIRGINIA
Contact Jim Coffin for info -- 703-256-3865 -- email - saml63@aol.com
There will be a WWI Guillow model event in addition to the usual FAC events
See rules in this MAXFAX - for info contact Bob McLellon - email - bobmcl@exis.net
- JUNE 9,10 2001** GLASTONBURY MODELERS CLUB -- FAC FOUNDER'S CONTEST
Contact Mark Fineman for info -- email -- Fineman@worldnet.att.net
- JUNE 9,10 2001** CAPITAL AREA ANTIQUE MODELERS ASSOCIATION SPRING FLING CONTEST
June 9-10 2001 Byrd-Mitchell Field, Culpeper, VA -- For Info contact Jim Coffin,
703-256-3865, - email: mailto:jmcoffin@aol.com -- contest flyer inside.
- JULY 20,21,22 2001** FLYING ACES NON-NATS GENESEO NEW YORK
Judging at Peters Party Complex starting at 2:00 PM Friday July 20.
See FAC Newsletter or email Ross Mayo - FACGHQ@AOL.COM--
- SEPT 22,23 2001** FLYING ACES OUTDOOR CHAMPIONSHIPS AMA National Flying Site
Muncie, Indiana - Contact Ralph Kuenz, Contest Director for more info at
14645 Stahelin Detroit, Mi 48223-3608 -- email -- rkuenz@ameritech.net
- SEPT 29 2001** KUDZU CONTEST AT RAEFORD , NORTH CAROLINA.
See inside for special 'Battle Of Britain' event rules.



The Inside Scoop

Stew Meyers

This issues theme is making Guillow's 500 series WW2 Models fly. The sub-text is the "Battle of Britain" tuning up for the Sept 29th Kudzu BoB event.

A couple of new authors have contributed to this issue. Doug Griggs is a relatively new Maxecuter from Damascus, MD. He had planned to do more of this issue, than just the P-40, but as an engineer at the model basin, he had to go on sea trials. I had received some beautiful photos attached to e:mail from John Robison in the other Washington, so I asked him to help out. He has sent in his experiences in making the Guillow's 500s go.

I have a go at the Me109. Of course Alan Shanzel has worked these over as well and his look great and don't fly half bad. Since the series 500 kits are current production and readily available the plans will not be reproduced only the modifications will be presented. We also go into the mechanics of rubber power fittings for both the front and rear ends. John gives us a treatise on building that is not just for beginners and Doug adds his hints. Claude describes his Guillow's Cessna. I have an article on Micro R/C linkages. There are flyers for the CAMMA Spring Fling and Brainbusters contest (featuring a Guillow's WWI event).

I need plans and articles for future issues!

Photo Caps

1. Nick Ropar is no longer with us. He succumbed to heart attacks recently. We missed him when he moved to New Mexico years ago and now we have lost him to the heavens.
2. A neat 'Dakota' by Ed Zapolski ready for the one design event at Ingleside.
3. Bob Flickinger is pleased as punch with his NoCal Laird racer.
4. Our 'Executive Editor', Stew Meyers celebrates the 'Black Hawks' with Pat Daily at Pat's recent model fest, seen here with Pat's Hawk and Stew's 'Big Ack'.
5. Dave Rees brought a nifty Electric Culver Cadet to Pat's, just out of his shop.
6. Walt Farrell showed up with a Found from Walt Mooney's plan.
7. Also at Pat's, Don inspecting the latest from Bob McLellon's shop, the Blohm and Voss competitor to the Stuka.
8. The arm and great little Waco belong to Paul Boyanowski at Muncie contest a few years ago.
9. Lindsey Smith sent this photo of his conversion of a Dumas Aeronca Champ to an L16 -- with Prince Philip and Princess Ann as pilot and

"Battle of Britain" Rules

Any sized rubber powered model is eligible from Peanut to Jumbo including Dimers. The model must represent a combatant in that battle and be in the proper colors and insignia. The contestant must prove the mark and colors are authentic to the era, but the model does not have to be of any specific aircraft. Any model entered must make 40 FAC points. There will be a mass launch fly off for the Brits and one for the Jerrys. The best 3 of each will be in the final mass launch battle.

I was about to decree that only the Me-109, Stuka, Hurricane, Spitfire and perhaps Defiant would be eligible; figuring none would fly a twin and the rest of the possible aircraft played a very minor role. I got beat up pretty badly at the bull session at Tom's especially by Don. Ok, so Bentio sent a token Gruppo to help out his buddy Adolph and one or two Fiat G50s and CR42s were shot down over England. It was a side show, but they were there in combat. Gladiators did fly combat patrols and got shot down. Battles did raid German airfields, lord knows they were useless for defense. If you want to enter anything more exotic better have proof. No trainers or recce's even if they did get shot down. And remember the colors and marks must be right for July to October 1940 and you have to be able to prove it.

Try this web site for BoB info.

<http://www.raf.mod.uk/bob1940/bobhome.html>



No shortage of good kits and plans for BoB

Comet dimers: Spit, Hurc, and Me109 (not the Arado) also E series 25" Stuka & Megow 30" Battle
All available as kits from Penn Valley

Wingleader has the Spit, Hurc and Me109 in their BoB series

Model Builder's Flying Scale Models of WWII has Doug McHard's Spit, Hurc and Me109

Dave Diels has kitted McHard's Me109.

Golden Age Reproductions has the Hurc, Me109, Defiant, and Battle.

And of course the Guillow's 500 series Spit, Hurc Me109, and Stuka as reviewed in this issue.

Just make sure you model the right mark and get the colors right.

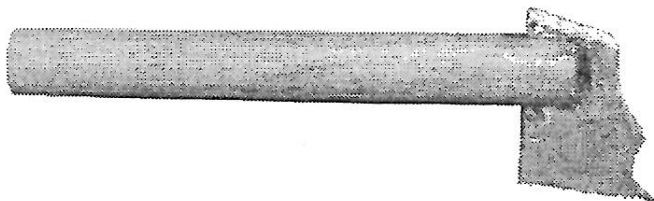
Guillow's WW2 Models

John Robison

Who hasn't marveled at the beautiful detail and accuracy of the Guillow's WW2 models? Unfortunately, dreams come crashing to earth quickly for those trying to get a good flying model by faithfully following the instructions. If only these flew off the board like Comet dime scale! I've been building these for a long time and have quite a collection of salvaged canopies and cowls from doomed aircraft. However, I'm here to tell you that it can be done and that if built using the following techniques you can also avoid a lot of crash damage as well. You will have the thrill of accomplishment when you see your scale model actually fly a decent length of time...it makes it all worth it!

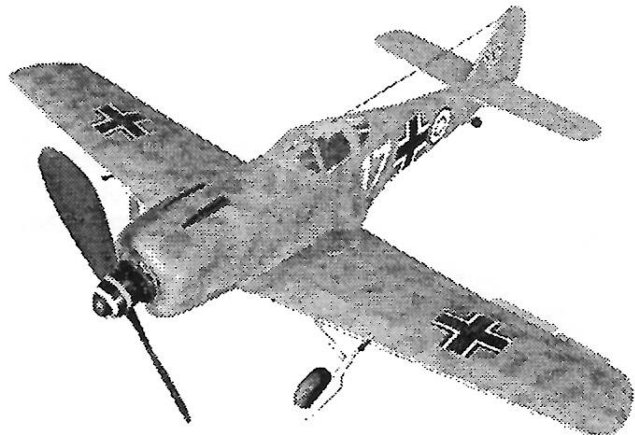
Step one: throw away the wood. I think it is made out of ironwood, not balsa. Go for stronger wood on the leading edges and lighter wood on the trailing edges. Then you've got to scour the innermost recesses of your mind to figure out how to reduce the weight of wooden parts even further. Make every other former and rib out of 1/32. On the remaining ones of 1/16 use light wood. Is it really necessary to have 3/8 inch wide wood for the trailing edge? Let's go for 1/16 or slightly larger. Hinoki for the wing tips and rudder outlines, etc. The fuselage formers should not only be thinner and lighter wood, but should also have the insides carved away...they don't need to be 1/2 an inch. Stronger heavier stringers help up front on the fuselage for impact damage resistance, and lighter stringers behind the motor mount keeps mass way down in back. This not only makes it so you don't have to load up weight up front (in fact I often have to put weight on the tail a little), but also helps the tail surfaces respond quickly to changes when necessary to pull out of stalls etc.

I like to use wire landing gear that plugs into aluminum tubes so you can fly wheels up if you want. Wheels themselves can be made out of foam with aluminum tube bushing. I've got a couple of homemade tools I use for making



foam wheels. You take some sheet aluminum and epoxy it into a dowel. Using a moto-tool I grind the aluminum until it is a cross-section of a wheel from the axle out to the edge of the wheel. Chuck it into a drill press and very slowly lower it into a piece of foam. Voila! Instant half a wheel! May as well whip out a bunch of them as long as you are set up. Then cut out the half wheels and glue 2 halves together to make a full wheel. Of course, use glue that won't destroy the foam, such as Elmer's. Drill a teensy pilot hole and bush with an aluminum tube. Better scuff up the outside of the tube to give the glue something to

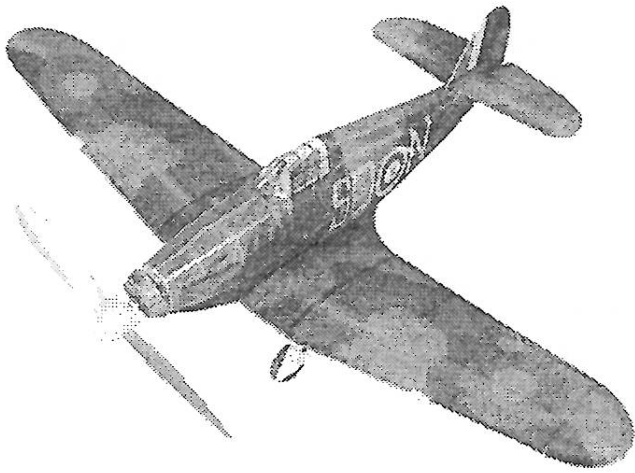
adhere to. Sometimes I like to use a hot metal file to create a tile tread appearance on the wheel. For those with access to a great vacu-form machine such as the \$70 Cross Hobby model, you can mold some plastic over a hardwood wheel to make half a wheel. If you like you can glue 2 halves together for a full wheel, or simply use a half wheel for reduced weight. Axle can be an aluminum tube lightly epoxied on both sides of the wheel. Don't get any epoxy in the holes! Better use your reading glasses, except you young whippersnappers. Turns out that one of these wheels is about 10% of the weight of a hardwood wheel. Goal: reduce weight, have landing gear that won't break off, and have wheel up, wheel down versatility. Yes, they add weight and drag, but you can't get neater looking



than a focke-wulf flying wheels down!

A hair extra dihedral might not be a bad idea. 1/4 inch on each side adds some stability and is barely even noticeable. Move rubber attachment point one bay forward.

The big improvement that needs to be made is to get rid of that damn thrust button. Even if you bush it with brass or aluminum it is still virtually impossible to shim...so what's the point?! Cut a big diamond hole in a resident genius Pres Bruning so you can get a pusher in there. Laminate wood on the front and back of the plastic cowl for support. On the nose block you might consider cross graining or using 1/64 ply somewhere. And here is the most useful tip I've ever received (actually I thought it up) for keep nose blocks from wiggling: For starters, have a good fitting nose block and coat with cyano to prevent wear. Then take a little tiny dab of ultra sticky florists clay and smear it around the plug that goes into the nose. That dam stuff is so sticky it won't be moving around at all. In fact, done right you can even test different thrust settings before committing to gluing in shims. And there is virtually no weight penalty. Furthermore, you won't be getting any friction and wear on your nose block. BTW, I talked to a vice president at Guillows a couple of years ago. He was totally ignorant of the fact that it was difficult to impossible to adjust the thrust with their little black thrust buttons. In fact, I'm not sure he knew what I meant by thrust settings. He also seemed surprised to find that someone actually tried to fly on of their airplanes.



John's Hurricane Kit # 506 (note nose block)

He thought people only built them for show.

Let's talk about props. It's no secret anymore that long and skinny props with a large swept area are more efficient than paddle type props. If you've been building according to my suggestions then you won't need a heavy prop up front for balance. Even if you do end up needing weight in front I believe you are better off having a light prop and adding some clay. Correct me if I'm wrong, but it seems to me that you only have a certain amount of stored energy in the rubber band. You can choose to use that to create a backward flow of air, or you can use it to overcome inertia and rotate a heavy chunk of plastic. I choose to create a backward flow of air. In Bill McCombs phenomenal bible "How to Make Scale Model Airplanes Fly" he has two sets of templates for suggested prop shapes. On a plane like these or Comet dime scale I'll take a 7 inch prop (I like the silver ones) and trace the shape of his recommended 8 inch prop onto it. Then I get out a tough pair scissors and cut around the outline. I scrape the blades with a knife and reduce as much mass as I can without compromising the strength. Make sure to have a sharp leading edge.

Naturally you are going to want to replace the pathetic rubber in the kit with FAI tan2. We should all be grateful that we have access to this rubber, although I was somewhat of a fan of the old Sig gray stuff, which seemed to last for years without deteriorating...great for us lazy bums.

Lastly, the kit tissue is your basic heavy stuff your father's day tie is wrapped in. Better shine it on in favor of some Jap tissue. Pre-shrink except on the fuselage or you'll be taking a quick trip to warp city at warp drive. I'm noted for my colorful and detailed paint jobs, most of which are totally inaccurate. Ask me if I care! I would love to pass on my highly opinionated tips, but I think I'm running out of space. Maybe some other time! I was never able to air brush worth a hoot until I took lessons from an expert who makes plastic models. He definitely had some great tips. It is so much easier when someone just tells you...I could have spent 30 years trying to figure that thing out. How about those \$6 air brushes at Harbor Freight? I

have used one before. Thanks, I'll keep my Paasche, but you know what? They actually work OK! You can't do anything sophisticated, but for what we do they are probably adequate.

So, long story short, how much do the finished airplanes weigh? With due diligence you can hopefully reach 16 to 18 grams or so not including rubber. If you are careful airbrushing with watered down acrylic enamel you'll only add about 1.5 grams. That is certainly worth it. Forget applying any coats of clear dope. (Hey where did everybody go? Come back!)

Lastly, let me climb on my soapbox. I'm thinking about sponsoring the Comet Sparky unlimited postal contest. This classic design is too cool! All modifications would be allowed including scaling up, scaling down, any changes in wood, laminations. All unreleased versions including those with subrudders would be OK. (I do have a friend with one of those plans, if you have one I would sure like to know). Planes would be free flight rubber only. 3 winners would be announced. Categories would be best flight time (of course), best decorating scheme, and most original concept (for example, a twin fuselage Sparky similar to a twin Mustang would be considered an original concept). Judges decision is final! Anyway, if you have an interest in this idea, chatter through the grapevine to me or call me at 509-534-2205.

elvis@crafthome.com

or drop me a note at 4102 E. 24th, Spokane, WA 99223
Best wishes...John Robison
BOUNCE BACK TO RUBBER!!

GULLOW'S P40 WARHAWK

Doug Griggs

I seem to share Stew Meyers' weakness for Guillows kits. I like the subjects, and I really like the prices. My favorites are in the \$6 to \$12 range. I'm a hardcore cheapskate. Now that I have now attended one FAC Nats, I guess that I am infinitely qualified to re-engineer classic kits. OK, stop laughin'. I did get *one* max.

The Curtiss P-40 Warhawk is my first attempt at re-designing a Guillow's kit (that's "gwillows" according to Stew). I have several others in the works, so if this one comes out OK, there should be some more in the near future. My original intent was to make this a World War II Guillows issue, but time and other interesting subjects overcame my intentions, so the P-40 is the only WWII offering this time.

The Guillows kit is number 501, and at a price of about 7 bucks is worth buying just for the 3-view and plastic parts. (OK, I hate plastic cowls in general, but you can use the canopy and cut the exhaust out of the cowl) The kit I have is kind of old, so the wood was really heavy, but recent kits have been using much lighter wood. (now it's only *sorta* heavy).

(The going price today seems to be \$9. Stew)

I scanned in the original Guillows plan and used Corel Draw 6 to re-trace the major part shapes that I wanted to preserve. The neat thing about the computer approach to the drawing is that I could "stack" the formers up using a common reference line (the side keel location in this case) and make sure the stringer lines were fair. That's part of why the stringer locations are shown with just a single hash mark.

The fuselage was built pretty close to Guillows original, substituting 1/20" balsa for the kit's 1/16" sheet steel (grin). I made the top and bottom keels from 1/16" square, and lightened the structure in the tail. The side keel was just another 1/16" square stringer. I also added one more former at the nose, and a nose block of 1/8" balsa to eliminate the icky plastic cowl of the kit.

I pinned down the upper and lower keels, erected the bulkheads (except B6) on the keels and added the side keel. After this bit was glued, I added F1 and B6 and glued them in. Then the assembly comes off the board and the right side bulkheads were installed, making sure that the bulkheads are true to the left side and perpendicular to the keel. If there is a small misalignment, make both sides alike. This is the dreaded "building in the air" method that requires constant attention to alignment. To avoid this, you can build both halves on 1/20th keels and glue the two halves together when they are formed. I haven't tried this method, so you're kind of on your own there.

Anyway, once you have the basic fuselage with the top, bottom and side keels installed, add the sheet parts like the wing saddle then start adding the rest of the stringers, alternating sides to keep things straight.

One sheet part needs special note. The little "fingernail" behind the cockpit is one of my favorite features of the P-40. Guillows calls for using bond paper, but I used 1/32" balsa and found it much easier to get a smooth surface. I glued a tiny bit of 1/16" scrap on B6 where the curved "tip" of the part will fit, just below the edge of the former. Then this part is easy to fit and form in the nice little curve, and fair in with a sanding block.

In shaping the nose area on the prototype, I overdid the sanding a bit, to the point where some of the stingers were transparent where they joined the forward bulkhead. (Doh!) I filled between the stingers and the first two bulkheads with light 1/16" sheet pieces to restore the lost strength, and fair up the nose. This bird will need a fair amount of nose ballast, so this really isn't a weight penalty. I'm pretty happy with the result.

The wing was next, and this is a more radical departure from Guillows plan. I used the cracked rib construction, though in hindsight, perhaps a sliced or laminated rib may look better. I think I'll try that on the next project.

The wing assembly was pretty simple, I pinned down the leading edge stock, pinned the center spar vertical, and started cutting the bottom "ribs" to length. I kept the spar loose so I could pick it up and slide the ribs into their slots as I cut them. I build "dry", pinning the assembly in place and gluing with CA after it is all put

together and aligned. (more on that later) Anyway, after the leading edge, spar, bottom ribs, trailing edge and tip sheet parts are laid in, I apply a drop of CA to each joint.

The cracked, top ribs I cut to approximate length, (uh, make them long rather than short, please) and sanded the mating angle with the leading edge by trial fit. Then I set the spar in place, held the front down at the LE with one finger, put another finger over the center spar and gently broke the rib by pushing it toward the TE. Then I fit the tail end of the upper rib with knife and sandpaper, and pinned it for the next glue round. Don't be afraid to practice your sailor words and then remake a rib that isn't right. Yeah, impatience is one of my vices too. Don't forget to add the 1/16" spar on the forward half of the wing, halfway between the leading edge and the main spar. Eyeball works pretty well for this placement.

I have started elevating the trailing edge at each wing tip with a bit of 1/16" square, before the glue-up of course. It is positioned to lift the rear corner of the tip rib and the trailing edge for washout. For some time, my opinion was that "I don't need no stinkin' washout!" Why would I *intentionally* build in a warp? Well, this P-40 taught me why: **stability**. The washout causes the tips to stall before the center section of the wing, and this (coupled with proper dihedral) contributes to roll stability. My prototype was shy on both tip washout and dihedral. She flies, but once the flight path is upset, it just cascades into a cartwheeling crash. The dihedral and washout will give the model more ability to correct little disturbances. The plans show a "corrected" dihedral, though I have not flight tested one with the new wing. When I fit the wing up to the fuselage, I failed to ensure that I had 4 deg of incidence on the wing, in relation to the stabilizer, so watch that. I made the wing fillet out of bond paper, but I am not too happy with the result. It helped to put a 1/32 piece behind the wing to support the rear edge of the fillet.

The tail feathers are nothing special, just thinned up a bit from Guillows. This is a pretty good place to use really light wood. The leading edges are 1/16" x 3/32", sheet parts are 1/16" and the spars are 1/16" square.

I chose a unique color scheme for my prototype, using the color plates in the Squadron Publications "Curtiss P-40 in Action" Aircraft number 26. I wanted something other than the ubiquitous "tiger mouth" of Chenault's Flying Tigers. The documentation shows a P-40 F with a matte black fuselage with red accents at the nose, ailerons, cockpit interior, insignia outlines and spinner. It also sported the yellow and black checkerboard tail and stabilizer of the 325th fighter group, the "Checkertail clan". This paint job was on the personal aircraft of the Checkertail's Commanding Officer LTCOL Baseler, repainted after considerable combat damage.

I covered the model with jap tissue, and ran some yellow tissue through my inkjet printer to get the checkered tail pattern and the panel lines. I shrank the tail surfaces using a cotton ball dipped in alcohol, and gently dabbed it over the surface to wet it out. This trick prevented the water spots that my other ink jet covering has suffered, and is my current method of choice.

How to get started making balsa wood airplanes

John Robison

For starters, you'll need some basic materials. Here is a minimal list:

Building board, preferably 2 inch thick stiff foam insulation from lumberyard. cheap route: 2 pieces of corrugated cardboard taped together (this is inclined to warp and is harder to push pins into)
Saran wrap or equivalent
Pins
toothpick
Glue; acetone based dries fast, but water based carpenters glue or elmer's doesn't have fumes
Razor blade or Exacto knife
Fine sandpaper, attached to a block of wood
Uhu brand glue stick

Take your airplane plan and lay it on the building board. If it is wrinkled or creased you can iron it flat. Cover it with saran wrap. Pin the saran wrap in place at the corners. You'll need to build wings, fuselage, stabilizer and rudder. I usually start with the stabilizer or rudder because they are easiest. Mark a piece of wood with a razor blade at the point where it will need to be cut. On a piece of hard cardboard make the cut. Be sure to get the ends cut at the correct angles so there won't be a gap where pieces join together. Gaps cause great weakness and usually get filled up with heavy glue. This reduces performance. If you get the angle wrong, you will hopefully be able to sand it to the correct angle with a sanding block. If it is too short you'll have to cut another piece.

Pin the newly cut piece of wood to the plan. Don't put pin through wood...use 2 pins on either side of wood and pushed in at an angle to keep wood flat. Take some wood and cut a 2nd piece. Make it one that joins to the first one. This time, put some glue at the place where they join. Put the glue on with a toothpick so you can use the absolute minimum amount of glue necessary to do the job. Proceed to the 3rd piece and 4th, etc. until the entire rudder or stabilizer is done. When glue is dry remove the pins and carefully peel the piece off the saran wrap. Test the joints and make sure they all are bonded OK. You may have to put a little glue on a joint if it seems weak. Oftentimes, the wing and fuselage are complicated to make. It is a good idea to study the plans until you think you are confident of how things should go together. By the way, don't get acetone based modeling glues on foam...it will melt it right now. I like to use cyano glues (superglue) in a tiny hypodermic needle. I use this for just about everything. When I put a small drop of cyano accelerator on a glue joint with a piece of wire it is bonded immediately.

Passing the needle through a candle flame keeps the needle unclogged. This method is not for everyone, but I thought you'd want to know.

When all the major body parts are complete, you'll need to cover them with tissue. First you must carefully sand the frameworks to get rid of bumps. They will give you a lumpy and wrinkled covering job if you leave them.

Don't press hard on the wood while sanding or everything will break.

Once smooth, pick a surface to cover. Flat surfaces are much easier than curved. Flat surfaces can be done all in one piece. Curved areas

must be done with several small pieces to avoid excessive wrinkles. Let's say you are covering the rudder. Take a UHU brand (the only one that seems to work for me [available at Michael's]), and lightly rub it several times around the outside of the rudder. Don't use it on the inside...that just adds weight. Once you do that put the lid right back on or it will turn stringy and unusable in hardly any time at all. Press the tissue onto the rudder and smooth it down trying to spread it tightly and remove any wrinkles. Work fast before the glue sets up. When it looks good trim off the excess with a razor blade. Some people like to use sandpaper to trim off the excess...it doesn't take too much sanding to get through tissue paper. Continue to apply tissue to the rest of the airplane. Leave a little space open behind or below where the rubber hooks at the back to help you see inside when you have to fasten the rubber.

Important things to know about tissue paper: Tissue paper generally has a grain to it. You can determine which way the grain runs by ripping the corner a little bit. In the direction of the grain it will rip "nicely". If you rip across the grain the rip will be jagged and obnoxious looking. If you don't run the grain correctly while papering you run the risk of having warps that will make your plane very hard to fly. The grain should run up and down on the rudder. On the stabilizer and wing the grain should run left to right. On the fuselage the grain should run front to back. Certain types of tissue shrink a lot. When they do they can easily warp fragile frameworks like the rudder and stabilizer. That's too bad, because if they aren't absolutely flat you probably won't be able to get your airplane to fly. You can get around that by pre-shrinking the tissue. Some people spray it with water and iron it. Others tape it onto something and spray it with water. Either way you are likely to get some wrinkles.

If you can figure out a way to do it without getting wrinkles, please let me know!

When you have all the parts covered in tissue, you'll need to seal the edges. Take a tiny amount of elmer's glue or equivalent and water it down about 50/50. With the tiniest brush you can find paint the tissue seams with the glue. This will keep the tissue from peeling back or coming detached when you shrink it. When the glue is dry spray the tissue with a fine mist of water from some kind of pump sprayer. These used to be called atomizers. I don't know what they are called now. Worse case scenario, you can wet a Kleenex and drag it over the tissue. That isn't a great way to go, but I've done it in a pinch. Even pre-shrunk tissue should be shrunk ...usually it can shrink a little more. A good way to minimize warps is to pin the pieces on your building board and let them dry for a couple of hours, or better yet overnight.

Once all your pieces are covered and shrunk you can glue them all together. This usually doesn't take very long, and all of a sudden it will look like you have a real airplane! Make sure everything is on straight. Often a piece will look straight when looking from the front, and it will look very crooked when viewed from the back. Do your best! At this point you can put on decals or other decorations. I often air-brush my airplanes. You really have to watch it because paint is heavy and can greatly reduce performance if you aren't extremely careful about how much you are putting on. Just forget painting with a paintbrush...there is no way to keep the weight down. Tip: Many times (especially on scale airplanes) I'll develop a great looking color scheme on the computer and print it right onto the tissue with my ink jet printer. If you try this, tape the tissue to regular paper and run it through. Be sure to run the tape all the way around the tissue or it will jam up. Also, you'll need to watch the paper go through in case you need to prevent a jam.

By far the best rubber to use is FAI TanII. Flight gets messed up when rubber bunches up at the back of the airplane as it unwinds. Avoid that by braiding your rubber. Braid a single strand of rubber by holding one end in your mouth and winding the other end. It is hard to say how many turns, but I guess 6 to 8 per inch. Then tie the ends together in a square knot. Important: tie one more knot because just one square knot comes undone easily. After you do this a few times you develop a feel for it. The braided rubber will look like a tangled up mess, but believe me it helps. Lubricate the rubber with armor all or equivalent. This will greatly reduce friction and allow more winds and less abrasion and rubber motor failure.

Insert the rubber in the fuselage making sure the knot is in the back. You'll have to fashion some kind of pushing stick with a groove in the end. I hate this part...it's not that easy, for me anyway. The rubber is generally held in the back of the fuselage with a piece of aluminum tubing, although a hardwood dowel will work (although with the dowel you won't be able to use a winding "stooge" to wind the rubber if you don't have a friend to hold the airplane). The other end of the rubber gets hooked to the propeller shaft which may be part of the nose block assembly. For planes that use nose blocks (not ones with

stick fuselages), it is critical that the nose block fit snugly. Any wobbling around destroys the flight and drives you nuts when you are trying to adjust it. I'll often harden the wood by rubbing super-glue on it, but even this isn't a permanent solution. Great tip: smear just a teensy bit of florist clay on the nose block where it fits into the fuselage. This stuff is incredibly sticky and never hardens. This will keep the nose block from moving.

Now it is time to test glide. Gently push the plane with the nose tilted slightly down. It's not a baseball...don't throw it! You should have a nice flat glide. However, you are likely to experience a stall in which the nose comes up and then the plane heads straight down and crashes. This means your nose is too light. Add weight to it, or slide the wing backwards, if you have a moveable wing. On the other hand, if the plane dives to the ground instead of having a graceful glide then the nose is too heavy (unlikely) and you'll need to add weight to the tail or reduce weight from the front by scraping the blade or some such. If you have a moveable wing you can move it forward. Do not wind the propeller up until you have it gliding well.

The first powered flights should be done with just a few winds just to see if problems come up, which they probably will. Start with 30 winds, then 40, 50, 60 etc. As you add more winds you'll need to have someone hold the airplane while you stretch the rubber band way out and wind. Using this stretch winding technique you can have about 3 times as many winds as if you do not stretch wind. You will probably notice that as you increase winds the plane starts to stall. If so, you'll need down-thrust to correct the problem. That means the propeller will need to be pointing a little more downward instead of straight ahead. Sometimes you need an incredible amount...oh well, whatever it takes! If you have a nose block, you can glue a piece of wood at the top. This will prevent the top of the block from going in all the way and so the prop will be pointing down. Re-fly the plane. If it still "power stalls" you'll have to add some more wood. If you added too much you'll have to sand some off. Only when you get a smooth flight without stalls or dives should you increase the winds. Be sure to use hard wood. Soft wood will simply smooch down and you won't have enough down thrust anymore. Quite a few airplane designs do not allow for this adjustment. Avoid them, or figure out how you are going to customize it.

Planes are made to go in a circle by making the propeller point towards the left or right. Figure out which direction your plane naturally wants to go, then add left or right thrust using the same technique as with the down thrust to make the circle a small enough diameter that you won't crash into the wall of your flying space. Much of time when your plane flies in a circle it will bank excessively with one wing up high and the other down low. Flying like this makes it difficult to obtain any altitude. Correct this by gluing a small tab tilted down on the wing that is low. If that pushes the wing up too high you can always cut the tab down smaller. Experiment.

There are many opportunities to improvise when making these airplanes, so always be thinking about better

ways to accomplish a certain task. This is your chance to innovate. If you come up with any great ideas I want to know about them!

Below is a formula to predict the flight duration in seconds of your airplane in still air.

$$D = 266 \left(R/W \right) \sqrt{A/W}$$

W = total weight (grams), A = wing area (square inches), R = rubber weight (grams). 266 is Finagler's constant.

(I have rearranged John's presentation of this formula to emphasize the two important terms R/W the percent of Rubber weight to Total weight and A/W or wing loading. Obviously reducing weight is the most effective thing you can do to increase endurance. The FAC 15% percent rule really translates to 13%. If $R/(W-R) = 0.15$, the way they use the ratio of rubber weight /empty weight, then $R/W = .15/(1+.15)$ or .13 or 13% a truly unfortunate number indeed.)..... Stew

Doug's Building Hints

Doug Griggs

In my travels in the rarified circles of the DC Maxecuters, I have spoken to several members about how they go about constructing their aircraft, and I find that my sons and I use a bit of a different approach. For what it is worth, I will try to give you some idea of what I do, and I will try to put it at a beginner level, so don't be offended by detail.

First, get a good flat board, I use some hard foam board that unfortunately, I cannot identify, it came from a friend who runs a sign business. It is flat, stiff and accepts pins easily. Other good stuff is Homasote; a grey paper based construction material available in 4' x 8' sheets at local home stores. It is popular for model railroad underlayment. Homasote is more difficult to push pins into, and will warp without support, Small pieces like the size needed for our planes are usually OK, and T pins alleviate the pinning pressure pretty well.

I cover the plan with wax paper pulled nice and tight over the plan and board and taped at the corners. Next I get my balsa stripper and make a small pile of 1/16" square sticks, usually starting with some of the stiffer wood. My balsa stripper is by Master Airscrew, cost less than \$10 and I consider it a vital piece of equipment. It has saved me tons of time and money on pre-cut balsa. Select enough pieces from your pile of strips to make the keels of the fuselage for half-shell models like the P-40 in this issue. For planes that have two flat sides, select the upper and lower sticks for *both* sides before you start building, and make sure they are of similar stiffness by gently bending them in your fingers to get the "feel" of the wood. This step helps make the fuselage tend to stay in alignment when the sides are assembled and bent into shape around the formers. With the primary fuselage wood selected, I pin the outlines down on the plan, putting

the pins in an "X" over the piece to hold it without splitting.

Now that you have a nice outline, it's time to stick them together. Initially, you may want to cut (or even break) the stick to rough length for the vertical piece. Use a sanding block to match one end of the stick to the angle that it meets the outline sticks. Just sand and trial fit until the fit is as perfect as you can get it. A perfect fit is more important than you might imagine. Thin CA has virtually no ability to fill gaps, and depends on the fit of the joint to maximize the gluing surface. Once the first end fits, lay the stick in position, and looking from straight above, mark the length with the tip of your knife about 1/64 to 1/32" long. Take the marked part to your cutting board (not on the plan, please) and cut it on the mark with a razor blade. I find the razor blade is easier to get a square cut with. Now go back to the sanding block and using *one stroke at a time*, and trial fitting each time fit the part perfectly into place. It should slide into place with just a bit of resistance, sort of like a good puzzle piece, and it should not distort the outline sticks. Don't hesitate to start over, you can probably use the piece in one of the shorter spots, and you'll soon get pretty quick at this. The perfect fit is *that important*. Note that nowhere in this method have we touched the glue yet. Pin the vertical in place if necessary, and keep on a-cuttin and a-fittin until all of the parts are assembled dry, pinned to your building board.

Now is the fun part. Get a piece of music wire, about .025", and bend the tiniest circle that you can in one end. I got one down less than 1/16" in diameter. Now you can get some water-thin CA, in a bottle with a *screw-on* top. I put my bottle in a little ring of modeling clay to prevent nasty spills. Unscrew the top and dip the wire applicator into the glue. It will pick up a nice, metered drop of CA, and let you put it exactly where you want it. I don't even get glue on my fingers much anymore. As you use it, the little loop will clog. I find that it still works pretty well even clogged, but you can clean it easily by lighting the dried CA with a lighter. Don't let your kids see you do this, or they will hover over you and badger you to let them "burn the next one". Guess how I learned *that* lesson. Try not to get too much glue on the wax paper as you dab it on the joints (though some is unavoidable). It also helps to keep pins away from the point of gluing, since some CA can wick down the pinhole onto the plan, complicating the removal process.

When the assembly is dry, gently pop the part off the wax paper. My youngest son Brian came up with an ingenious little trick; he just grabbed a pin and slid it around flat between the part and the wax paper, and the part just popped up. Little smart aleck. I usually just pick up a joint that seems to want to let go, and pulling straight up right at each joint just work the part off the paper. A bit more brutish, but it does work.

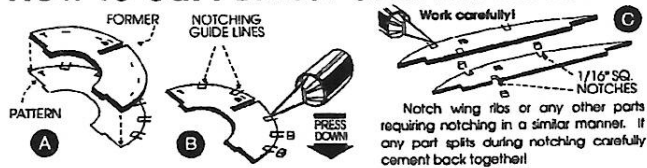
This method serves me well, as it makes the construction seem to go faster, it is simple enough that my 10 and 13 year old kids have adopted it and it keeps the CA off your fingers. Mostly-

Guillow's 500 series for the BoB

Stew Meyers

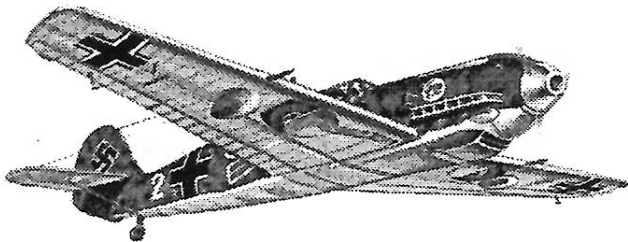
I had hoped to show how the four BoB models in the Guillow's 500 series were good candidates for the Kudzu BoB event. I went out and bought them. When I opened the Bf-109E kit several things stuck me. One, I had seen this before. Heck, I had built it a long time ago. Two, the wood was now somewhat lighter and thinner, but still ill suited for competitive flying models and varied in density from sheet to sheet, ie: half the formers are much heavier than the other half. Another interesting thing was the formers now only had the keel notches cut in them.

How to cut Former and Rib notches

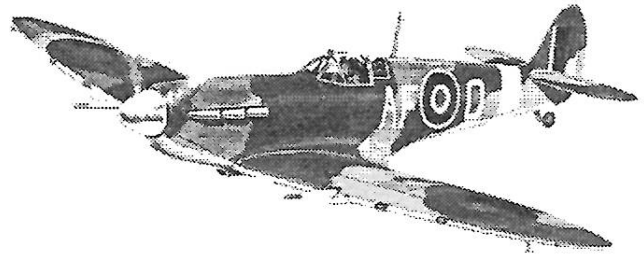


These keel notches are still too large. The stringers only had the bottom of the notch die cut. There was still some "die crunching". All in all the formers still need to be redone. The wing is multi spars with thick leading and trailing edges and an abysmal arc airfoil. It needs redoing and more dihedral. The plastic nose allows for neither thrust adjustment or adequate rubber loading. These features are common to all the kits in the range.

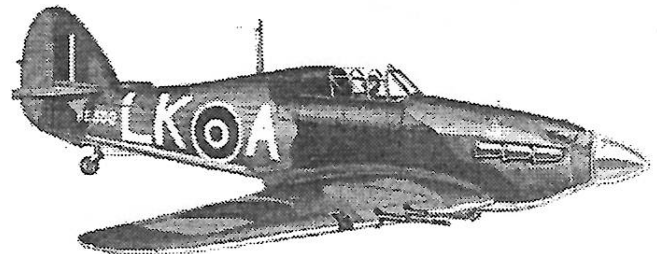
The worst feature of this particular kit was that although the box says Bf-109E, the picture shows a plane with no under wing radiators, a big clue.



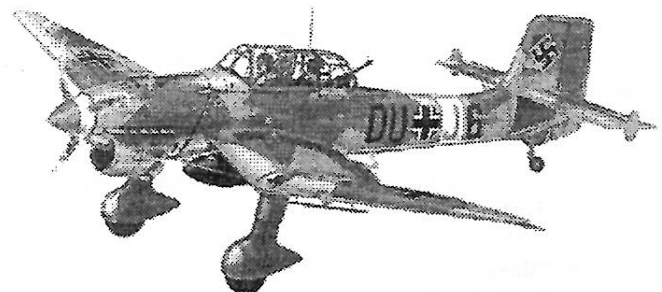
The box art shows a typical Emile oil cooler under the nose. No radiators on the this plane; no craft like this ever existed! The plans and 3-views however show the stretched bogus shape perpetrated upon the modeling public in 1940 by William Wylam as the Me109J. This comes closest to the 109-B, C or D Junkers Jumo 210 powered versions with a large chin radiator and no wing radiators. The aft fuselage is grossly elongated. Ugh! The color scheme is also wrong for the BOB. My faulty memory is spurred! I dug through my files and discovered the old plans suitably marked up. **NB** this kit is ineligible for the BoB unless modified. I show the mods required to make the kit a real Emile.



The Hurricane and Spitfire kits purport to be the MK-Is eligible for the BoB - kit art aside. If you build eight gun versions not the cannon armed versions shown on the boxes, they're not too bad. The Spit is obviously lifted from 1940 Wylam drawings as well, but it is much closer to scale. Not surprising in 1940. They both need to be lightened of course and have balsa nose blocks, more dihedral, and bigger stabs. The nose block should separate just ahead of the exhaust ports. John Robison has done this on his models.



The Stuka really is a B model and the color scheme is ok. It needs to be lightened up per the techniques mentioned else where in this issue of course. A little more dihedral wouldn't hurt either. The landing gear pants are a real bummer. Better looking ones perhaps with a non-rotating wheel are really required. The flaps might better be light sheet or at least pre-shrink your paper and use well plasticized dope. Small warps on these make a big difference in trimming. I might simplify the canopy to save weight, using the front and rear pieces and filling in between with lighter plastic and bond paper. Do use pilots even if only profiles.



Rubber Motor Mechanics

Stew Meyers

In order to function efficiently, there should be a low friction thrust button firmly mounted in a nose block that allows for thrust adjustments. The nose block needs to be removable to load the wound rubber motor, yet be securely held to maintain constant thrust angles.

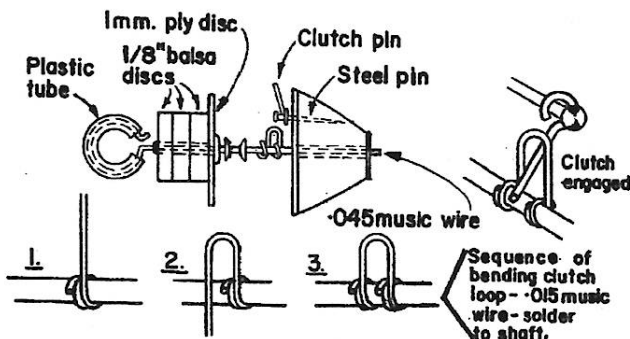
When the rubber winds down and the glide phase is entered, the nose block should stay in place to avoid cg shifts and/or loss of the front end. Some sort of clutch is highly desirable to allow the prop to free-wheel and not upset the glide trim. It is also desirable to keep tension on a braided motor with out interfering with the ability of the prop to free-wheel. Again to keep cg shifts to a minimum to reduce upsets to the glide trim.

A reverse S-hook is used to keep the rubber from climbing the hook and jamming. The size of the hardware depends on the torque of the motor. For peanut to dimescale 1/32 music wire is sufficient for the prop shaft.

The rear motor peg should be located further forward than shown on most plans. The cg of the rubber should ideally coincide with the cg of the airframe or at least not be very far aft. And of course the rear peg should be affixed so as not to come out and release the energy of a wound motor to wreck havoc.

For models with out spinners the swing clutch can't be beat. The simple notch clutch has the drawback of not tensioning the motor.

For models with spinners Doug McHard presented a neat scheme in the Model Builder WW2 Scale book.



Doug McHard's Me109 Clutch

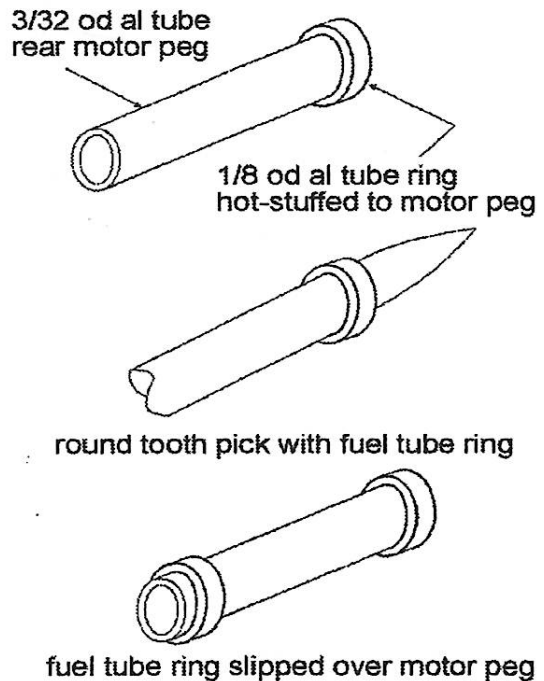
If the clutch is silver soldered to the shaft (and this is the most reliable method of attachment), extreme care must be taken to prevent the acid flux from flowing into a bearing. The shaft must be well cleaned of the flux and neutralized. If these precautions are not taken the shaft will rust and the oxide will increase the diameter of the shaft until it freezes in the bearing. This applies to the bearing in the free-wheeling prop as well as the thrust button. You have my word on it! Of course if you use cyano acrylic, you won't have to wait any time at all for the shaft to seize.

Rear Motor Pegs

Stew Meyers

I use an aluminum tube for the rear motor peg to allow a wire to be inserted in it to mate with my stooze or make it easier for a human stooze (Mechanic) to hold. As models are flown the holes that support the rear motor peg (RMP) eventually enlarge and the peg works its way out to disastrous results. I have tried reinforcing the holes with hard balsa, hot stuff, and plywood all to no avail. I have used rubber bands around the fuselage looped over the peg. In order to be effective these must be tight enough to crush the longerons.

I finally came up with a scheme that works. Make the RMP from aluminum tubing about 3 diameters larger than the fuselage width. Hot stuff a ring of aluminum tubing the next size up on one end. Then insert the rubber with a stuffing stick and slide the peg in place. Now take a piece of silicon fuel tubing that is a tight force fit over the aluminum tube used as the peg and cut a thin ring from it. It should be nearly impossible to jam this over the tube with just your fingers. Thread the ring over a round tapered toothpick. Insert the end of the toothpick into the RMP tube and work the ring over the end of the tube. The RMP is now locked into place and won't come out. To remove it, refit the toothpick into the tube and push it against the fuselage. The ring will transfer to it as the peg is removed. This of course can be scaled up to suite any sized motor, and indeed becomes more important the larger the motor. I use the back of a paint brush to substitute for the tooth pick on my larger motors.



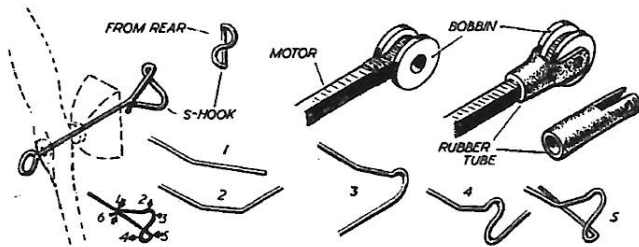
Fittings for Rubber Motors

Why S-hooks

Circular and diamond shaped front hooks for rubber motors suffer from the defect that the wound motor often tries to "climb" round the wire resulting in an uneven motor run or even rubber bunching and the shaft completely. S-hooks completely eliminate this trouble provided they are bent the right way round and are true as regards alignment with the shaft.

An S-hook is a self-aligning fitting. When wound, the motor tends to creep to the exact middle of the S and will remain there. Bend the S the wrong way round and the motor will work right off the ends of the ends of the S, showing just how positive motor "creep" is with this type of hook

The S-hook is easy to bend if you follow the six simple stages shown. The two half circles which form the actual S shape should be made with round-nosed pliers. After completing stage 5, make sure that the center of the S is lined up accurately with the shaft.



For the rear rubber fitting, loop the strands over a bobbin and bind tightly tip to the bobbin with a rubber band. This will give a convenient, anti-bunch fitting for the back of the motor and one which is readily secured by the rear peg passing through the center of the bobbin. This is a perfectly satisfactory arrangement for moderate length motors, but bunching troubles may still be experienced with really long motors. The cure here is to use a bobbin, as before, but slip over it a length of stiff rubber tube (e.g. rubber gas tubing) which has been slit and pierced so that it can be drawn over each side of the bobbin. The rear peg then anchors the rubber tubing as well as the bobbin and provides a stiff lever to prevent the motor doubling back on itself into a bunch.

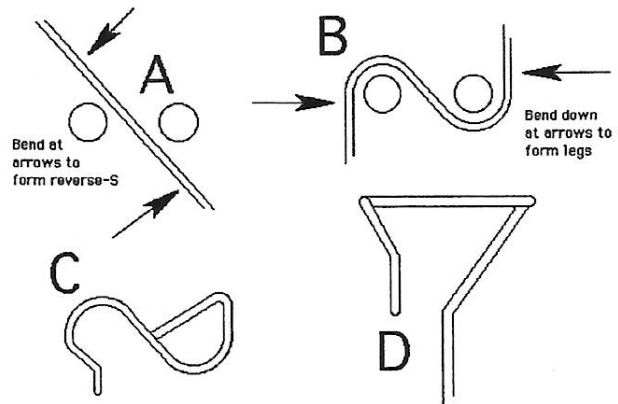
Bending a Reverse-S Prop Hook

Thayer Syme

A number of folks have been asking about bending prop hooks, and what are good designs. The Reverse-S hook has been a favorite for a long time, despite apparent complexity. Its advantage is that it helps prevent the motor from climbing on the hook, allowing longer, more consistent motor runs. Who invented it? I don't know, it far predates my involvement with Free Flight.

At first glance, it seems difficult to bend, but with a little practice, you should find it well worth the couple tries it took to get the hang of it. Try with some soft wire, like paper clip stock and it should come quickly. The only unusual tool you will need is a pair of round nose pliers.

First hold the wire in the pliers as shown below in figure A. Twist the loose ends counter clockwise as shown in fig. B. The two ends are then bent down at the points shown by the two arrows. If you bend the legs the wrong way, you will have a prop hook which the motors will easily climb off. The legs are then shaped as shown in fig's C&D. One leg is cut off and shaped to allow easy loading of the motor, the longer leg is bent to form the prop shaft. The key to getting a smooth running prop is to center the shaft as accurately as possible under the hook. This is done by trial and error, bend a little, spin the shaft between your fingers while sighting the hook, and make another adjustment. Honestly, this is the only slightly tricky part of bending these hooks. Remember that an off-center hook will cause a lot of power and duration robbing vibration. It is worth an extra bend or two to get it right.



When I can't find my RN pliers on my cluttered work bench, I use two steel pins clamped in a vice as a bending jig. This works just as well, and also allows bending smaller hooks for indoor duration type models. For instance, for a mini-stick prop hook, I use two pieces of .032 music wire clamped in a vise. They are spaced just far enough apart to allow insertion of the 0.011 wire I use for the shafts.

One last quick point. If you are working with a piece of wire longer than a few inches, please take a couple seconds to put a masking tape flag on the long end. These small sizes of wire whip around pretty easily. If an end finds your eye, it will be tough to see how true the hook is running, or how beautifully it flies your model.

(The first article on this page is from an English kit, I think, and lays the theory out very well. Thayer's article is from the "windy sock" and nails down the practice.) . . . Stew

Swing Clutch

Stew Meyers

The swing clutch consists of a base fastened to the prop shaft that has a "U" shaped bale hinged 90 degrees to the shaft which spans the trailing edge of the prop and bears against the prop shaft. When the shaft is driven by the motor torque, the bale traps the prop and drives it. When the prop shaft stops, the prop continues to swing in the drive direction and knocks the bale out of position allowing the prop to free wheel.

For small models I prefer to bend my clutch base up out of brass shim stock 0.010 to 0.015 thick. Cut a strip of shim stock 3/16 wide and about 1/2 inch long. Fold this in the middle around a piece of 0.025 music wire. Then crimp the two sides together with a pair of needle nose pliers with the wire in place. This will form the hinge hole. Now holding the wire center punch and drill the 0.030 hole for the prop shaft.

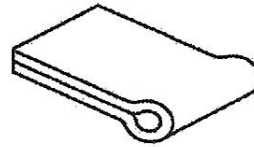
Assemble the prop shaft with an S-hook through the thrust button in the nose block. Sharpen the end of the 1/32 prop shaft slightly so that it can pierce the slightly under sized hole you drilled. This tight fit will help hold it in position when it is soldered up. Force the prop shaft through the clutch base hole. Slip a piece of 1/32 id brass tubing 1/32 long over the prop shaft against the clutch base. This will increase the solder area in contact with the shaft and greatly increase the torque transfer capability.

Hold the unit horizontal with snap clothes pins. Make sure you have removed the .025 music wire. Apply a drop of acid flux to the brass tubing and shaft. Be very careful not to let any flow back into the bearing! Touch a very hot soldering iron quickly to the shaft and apply some silver solder (I prefer Sta-Brite flux and solder. I also use a big Weller soldering gun). It should solder up instantaneously with a nice fillet of solder round the brass tubing, shaft, and clutch base. Also touch the raw edge to flow solder between the sheet of the base. Don't hold the iron in place long enough for the heat to travel away from the desired spot to some undesired spot like the nylon thrust bearing. Flood the parts with a solution of baking soda and clear water. Rinse again with pure water. Solder may have clogged the hinge hole, drill or ream it out.

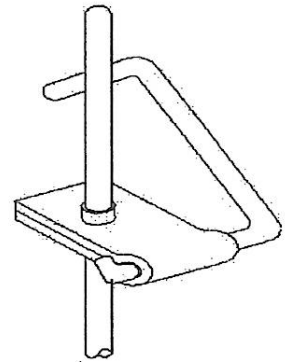
Now to make the bale. Bend a short (1/32) leg on one end of a piece of 0.025 music wire to retain it in the hinge hole. Smooth the end of the leg with a file. Insert the bale in the hinge hole. Make a 90 degree bend on the other end. Slip a prop on and see how long it needs to be. Make another 90 degree bend parallel to the first side beyond the prop shaft. Cut the end of the wire 1/4 inch beyond where it crosses the prop shaft. File or grind the end smooth.

Test the action. You should be able to back drive the prop shaft with the prop as if you were winding the motor. When you hold the shaft and blow on the prop however, it should kick out the bale and spin freely.

Strip some soft insulation from a piece of #24 wire. Cut a short length of this to retain the prop on the shaft.

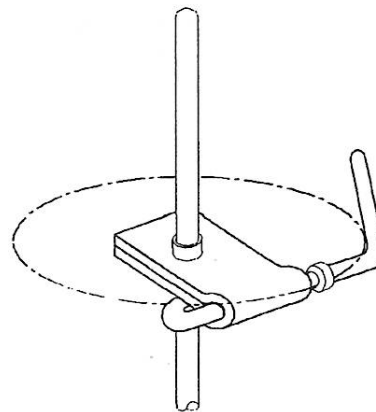


Base



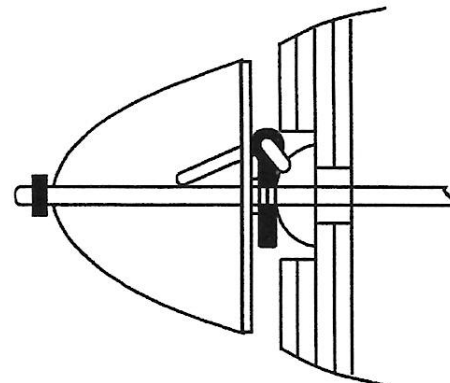
Assembly

If you bend a "U" in the end of the bail rather than just a short right angle leg, you can use the swing clutch with a spinner. Be sure to round the end of the bail to prevent impalement. The drive arm of the bail sticks up outside the spinner and catches the trailing edge of the prop very much like the regular swing clutch except that there is nothing ahead of the prop to take the thrust load. While the soft insulation tubing is sufficient to retain a free wheeling prop, it is not enough to take thrust and a washer or bit of tube must be soldered or epoxied to the shaft to hold the spinner on. Remember the spinner assembly with the prop must be able to spin freely when the bail is tripped. Note also that a bit of tubing is epoxied to the bail keep it engaged under the clutch base. The "U" bend in the bail is approximately 90 degrees to the drive arm.



Spinner clutch

An undesirable side effect is that there must be about a 1/16th inch gap between the front of the nose block and the back of the spinner to allow clearance for the bail. The thrust button can be submerged a little but nowhere near like Doug McHard's set up. This approach is much simpler than Doug's however and can be used with very small spinners.



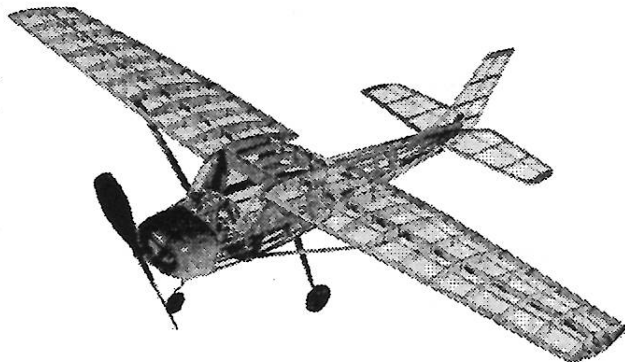
A GUILLOWS KIT SAGA

Claude Powell

Guillow's Kit # 309 is a CESSNA 150 with a 24" wingspan, plastic nose cowl and wheel pants, and may be built for 1/2A gas or rubber. The model, needless to say, would be too heavy for rubber if built as designed. However I was looking for a modern civilian contestor (one that no one else was flying, naturally) and the plan "LOOKED" right. I built it a couple of years ago (the first time-see "rest of the story") and it has proven to be a reliable flier and more competitive than I expected. This kit is still in production. Incidentally, most Guillow kits build up too heavy for rubber but their plans are excellent and well designed. They always have a 3-view and ALL parts are shown on the plan sheet, a real plus. The only thing I used from the kit was the decal sheet. There are two reasons for doing this. One is obvious, weight saving by using my own materials and the second is less obvious, to preserve the kit (mostly intact) for future use (sometimes the company goes out of business).

I built the model to the outlines on the plan but lightened up the construction considerably. Since this kit uses half shell fuselage construction, I applied the building techniques described in the JAN-FEB 2000 issue of MAX-FAX. This allowed me to build right-thru the area where the plastic nose cowl was designed to be. Also I built the wing in one piece and moved the rear motor peg forward one inch to the next former. My model weighs 42 grams, without rubber, but balanced to fly. The wing area is approximately 84 square inches which works out to 0.5 grams/square inch, not super light but about my usual flying weight.

I'm flying with a 7" Peck prop and two loops of 1/8" X 26" braided Tan II. The model flies left/left. To help hold the left wing up during the power burst I put a 2" triangular balsa strip under the left wing trailing edge. I dislike paper tabs and avoid them when ever I can. Try one of the Guillow kits and be surprised.

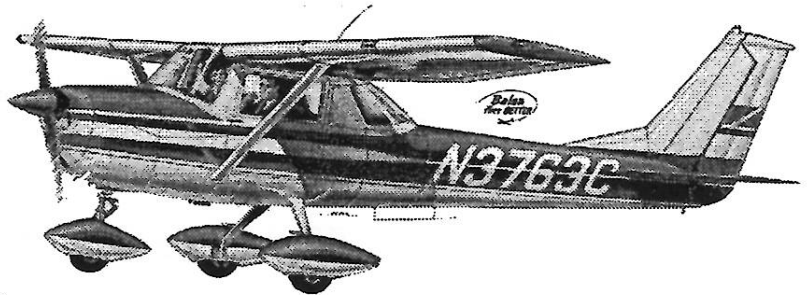


THE REST OF THE STORY

A couple of years ago I was flying the Cessna (just completed) at a COMSAT contest and hung it high in a tree and had to leave it. Several months later at a READING, PA. indoor meet Tom Hallman returned it to me after finding it on the ground (I guess HUNG had blown it loose). All the flying surfaces were broken and the tissue was in tatters but the fuselage was intact. I stripped the fuselage and built all new appendages. The next years contest at COMSAT I got a 1st place with it (with a lot of luck). I was flying with the same rubber loop that was in it when lost in the tree a year earlier!!

CONSTRUCTION TIP REVISITED

In a recent MAX-FAX issue I said I exercised only general weight control on balsa selection by weighing complete sheets vice individual strips. After thinking about this statement I'm afraid it may have been perceived as a callous approach. Nothing could



be further from the truth. Consider the following example.

You are going to construct a 16"-20" wingspan model and the primary wood will be 1/16" thick balsa. You would probably select 8-10 lb balsa for the leading and trailing edges of the wing and the fuselage longerons. For the fuselage uprights, wing ribs and other low-stress parts you would probably select your prized 4-6 lb balsa. This wood selection would produce a light and strong model however weighing these individual strips/pieces will be tedious and time consuming even with a very accurate (expensive) scale.

A simpler approach, to achieve essentially the same results, would be to select a sheet of 7 lb balsa, holding it up to a light and identifying the dark and light areas of the wood. The dark (heavier) wood will be in the range of 8-10 lb balsa while the lighter area must be 4-6 lb balsa in order for the whole sheet to average 7 lb/cubic foot. The KISS principal in action!!

Okay so this isn't a WW2 model,
it is a Guillows made to fly well.

Stew



CAPITAL AREA ANTIQUE MODELERS ASSOCIATION

SPRING FLING 2001 FREE FLIGHT CONTEST

June 9-10 2001 Byrd-Mitchell Field, Culpeper, VA

**FLY ANY EVENT EITHER DAY:
MUST COMPLETE ALL FLIGHTS SAME DAY, HOWEVER.**

Saturday 8:30 AM-5:30 PM, Sunday, 8:00 AM - 3:30 PM

AMA EVENTS

101: 1/2 A GAS

124: P-30 Rubber

101-105: A/B/C/D GAS Combined

140: Hand Launched Glider

120: Mulvihill Rubber

142: Catapult Launched Glider

SPECIAL EVENTS

**NFFS 1/2 A Nostalgia Special Bill Saunders Memorial
Unique Trophy & Merchandise**

NFFS Nostalgia A/B/C GAS Combined

Old Time Rubber Stick - Old Timer Gas Combined - Old Time Rubber Cabin

.020 Replica Gas

FAC Events

**MASS Launch Events: - Saturday, WW I - Sunday, WW II
Timed Events (Either Day): Golden Age, Dime Scale and Embryo**

**Entry Fees: Open - \$10 First Event, \$3 each addition, \$16 Maximum
Jr - Sr - \$2 all events.**

**Contest Director: Dave Lacey, 510 Tennessee Ave, Alexandria, VA 22305
703-548-9058**

Alternate: Jim Coffin, 703-256-3865, - email: jmcoffin@aol.com

Use of Byrd Field courtesy of the Inskeep Family of Culpeper, VA

Special Note: RC FLYING IS PROHIBITED AT BYRD FIELD!!

DREADED BRAINBUSTER SQUADRON

OF THE

Flying Aces Club

Spring Rubber Scale Contest
Petersburg Airport, Petersburg, Virginia

Saturday May 19, 2001
In conjunction with the Brainbusters Spring Free-Flight Contest

ENTRY FEE: One buck

RULES: TIMED EVENTS: (Total of three flights)
Six attempts for three official flights (over 20 seconds)

MASS LAUNCH EVENTS:
Number of flights will be at discretion of flight leader.

GUILLOW WW-I: (Run by D.C. Maxcuters)

Target time event. Any power other than gas/glow. Built from plans as published in MAXFAX or from a kit from which the plans came or from a DPC reproduction kit. Construction changes will be allowed as follows: Fuselages may be changed to longeron-box. Wings and empennage may use reduced cross section members but must have at least the same number of ribs and spars. These may be repositioned. Span must remain at 18 inches. Light wheels may be used. Rigging must be included. Guns and a profile pilot req'd. Scale colors and insignia req'd. Wood nose construction may be substituted for plastic.

EVENTS: Mass Launch Events: 1:30 P.M. WW-I Guillow
2:30 P.M. WW-II
Timed Events: Golden Age, Dime Scale, Peanut, Embryo
Special Events: 3:30 P.M. Earl Stahl Mass Launch*
4:00 P.M. Cloud Tramp*
* non-kanone events

No semi-scale models permitted.
Flying will end at 4:00 P.M.

Contest Director: Abram Van Dover
Flight Leaders: Bob McLellon (757) 481-0480 (bobmcl@exis.net)
Jerry Paisley (804) 357-7642 (jerpaisley@earthlink.net)

AMA LICENSE REQUIRED

Micro R/C Control Linkages

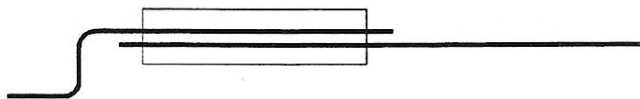
Stew Meyers

Make the control horns from 1/32 plywood with a 0.020 hole drilled for the linkage. Reinforce the hole with cyano. Hinges are a piece of 3/32 x 5/8 Sig Super Hinge.

The push rod itself can be 3/32 sq hard balsa with a length of 0.025 music wire bound with thread and cyanoed to the ends. Or a length of 0.025 music wire run inside a piece of nylon tubing from Sullivan's flexible throttle linkage. This combo can be flexed quite a bit and still run smoothly. The tubing must be supported at several points to keep the assembly from buckling under compression.

The easiest way to mount the servos is to glue them into place with a dab of RTV or PFM. Make a Zee bend in the 0.025 music wire and remove the bell-crank from the servo (don't loose the screw). Snap off the unused arms. Install the push rod and slide the Zee bend into the hole in the arm. Reinstall the bell-crank back on the servo.

At the rear end, clip the wire linkage off 1/2 " forward of the control horn with the surface and servo in neutral. Make a Zee link of 0.020 music wire 1-1/4 long. Slip it into the horn. The wires should overlap by 3/4". Slip a 1/2" length of 1/16" dia heat-shrink tubing over this overlap. Position the servo and control surface in neutral and shrink. If you use a heat-gun, put a piece of Al foil backed by two layers of paper towel between the tubing and the model to protect the model. The resulting bond is tight, but the wires can be forced to slide for adjustment. When everything looks good run some glue down both ends of the tubing. Cyano if you are sure you never want to readjust it; thin Ambroid if you want to preserve your options (you can redo it with acetone).



Don Srull who originated this technique uses the spaghetti tubing supplied with Deans connectors rather than shrink tube. I find this forces me to use larger diameter wires. You can take two pieces of 0.025 music wire and shrink heat-shrink tubing over this off the model. Then force the heat-shrink tubing off the wires and use it on the model for a tighter fit on smaller wires.

I also like to use pull-pull cables to the rudder which mimic full scale practice on WWI models. As long as the control horn cable attach points are the same distance apart as the holes in the servo they are attached to, the routing in between can be any path. I like to use short teflon tubing fairleads as pulleys for small angle changes (< 30°). For the elevator I often cheat by only pulling up and using a light rubber band to pull down. This is much easier to rig and adequate for the slower flying models since the servos have excess power. I use non-stretch fishing or 1/2A control line and small piece of crimped tubing glued instead of a knot.

Photo Caps Guillow's WWII

10. To start off this Guillow WWII page we have Allan Schanzle launching his Hellcat.
11. John Robison, a west coast contributor to this issue, with his Guillow's Focke-Wulf.
12. John's photo of his Focke-Wulf 190.
13. And here is Allan Schanzle's Focke-Wulf 190 from the Guillow kit.
14. Allan must have built most of the Guillow WWII models -- here is his Avenger.
15. And one more here is Allan with his Zero.
16. No not a Guillow's but a Me109E from a Golden Age Kit. by Pat Daily. Pat is ready for the 'Battle-of-Britain' event at the Kudzu fun in September.

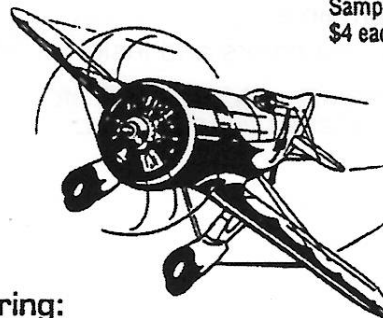
Leonard Opdycke who puts out the two excellent magazines listed below reminds me that he built a real Bristol Scout and owned the Cessna 37 shown in the last issue. He built several of the bigger Guillow's WWI models for free flight gas. Both eventually flew OSS.

COMING AT YOU!

Two Quality Journals

- *Skyways* (1920-1940)
- *WWI Aero* (1900-1919)

Sample issues
\$4 each

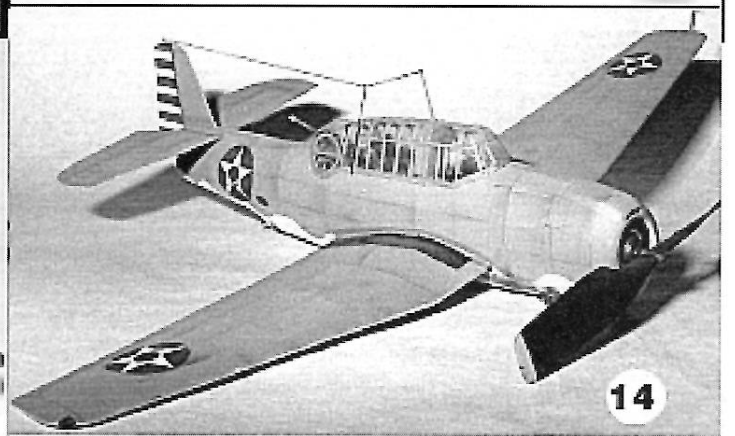
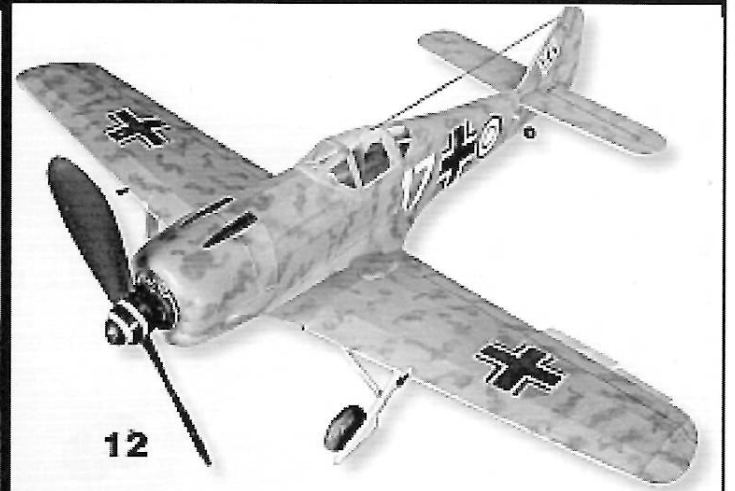


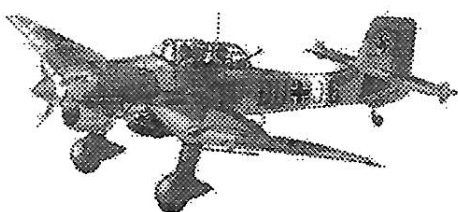
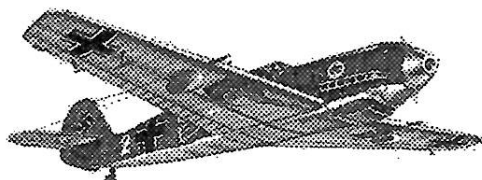
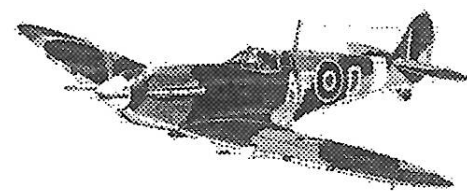
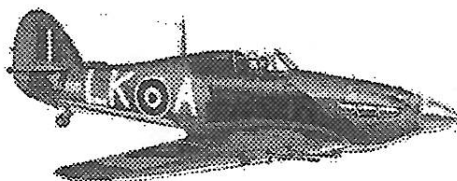
Featuring:

- Airplane restorations & reproductions
- Indepth articles on historic aircraft
- Great photos including details & cockpits
- Scale & flying models
- Accurate, detailed drawings
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15 Crescent Road, Poughkeepsie, NY 12601, USA (845) 473-3679

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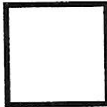


This years Kudzu special event is the "Battle of Britain".

Any sized rubber powered model is eligible from Peanut to Jumbo. The model must represent a combatant in that battle and be in the proper colors and insignia. The contestant must prove the mark and colors are authentic to the era. Any model entered must make 40 FAC points. Dimers are eligible, but that Comet 109C better look a lot like an 109E in the right colors and that Guillow's Me109E better really be an Emile as well. There will be a mass launch fly off for the Brits and Jerrys .



NOTE: Your Dues Are Due



CLUB OFFICERS - President: Hurst Bowers, 1649 Birch Rd., Mclean, VA 22101
Secretary: Bert Phillips, 1709 Crofton Pky, Crofton, MD 21114-2305
Treasurer: Norm Davison, 14008 Castaway Dr., Rockville, MD 20853
Editor: Stew Meyers, 8304 Whitman Dr., Bethesda, MD 20817

MEETINGS - The D.C. MAXECUTERS hold meetings at 8:00 pm on the first Tuesday of every month at the College Park Airport, the oldest continuously operating airport in the world. Daylight savings rule not in effect.

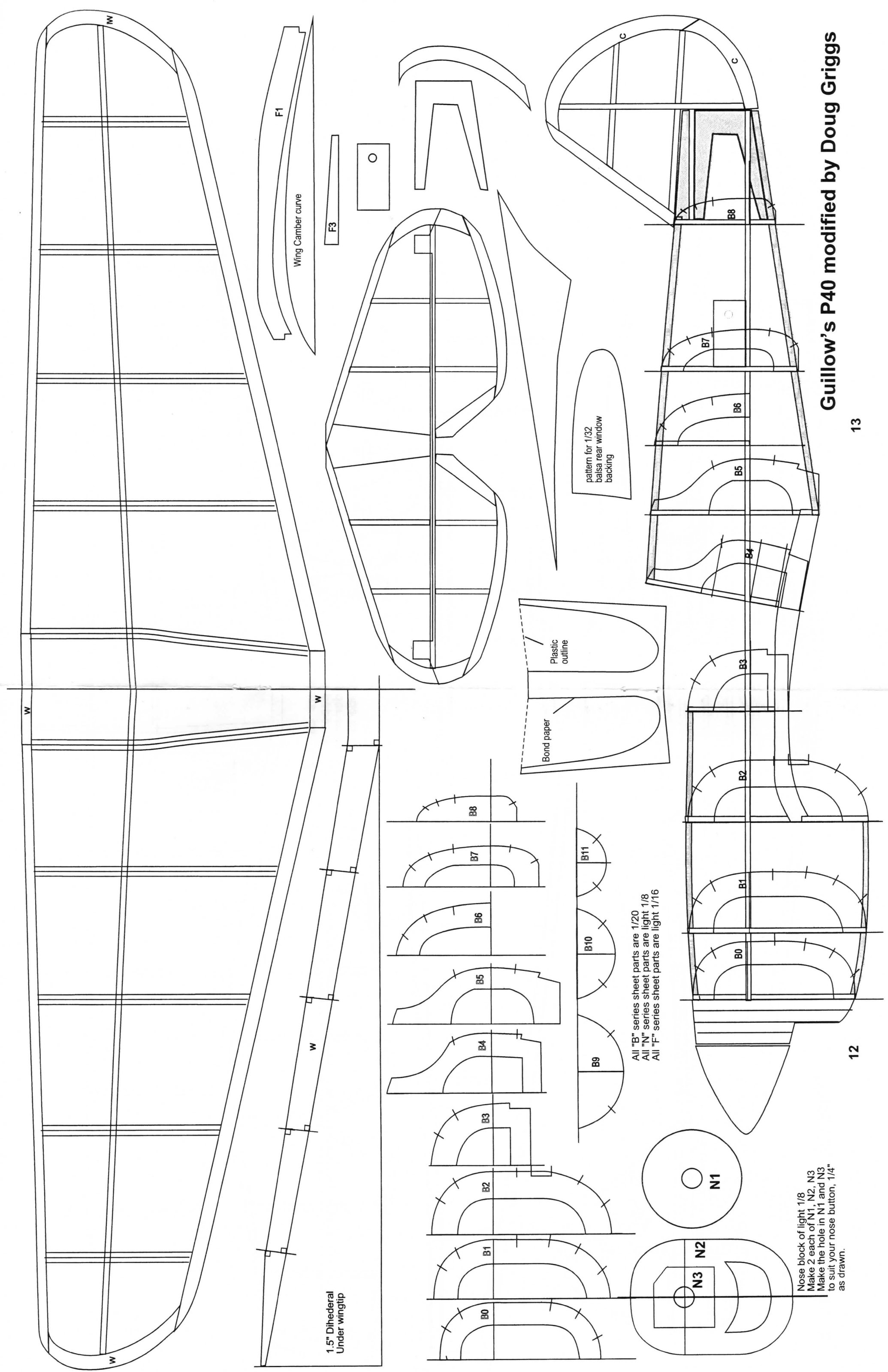
MEMBERSHIP - Dues for membership in the D.C. MAXECUTERS are \$15 per year for residents of the USA, Canada, and Mexico, and \$25 for all other countries. Your mailing label indicates the year and month of the last issue of your current membership. A red "X" in the box above is a reminder that your dues are due.

Send a check, payable to the "D.C. MAXECUTERS", to the treasurer, Norm Davison.

PUBLISHING DATES - Six issues of **MaxFAX** are sent each year as close to the nominal dates as possible, but since this is a volunteer publication nothing is guaranteed except that six issues will be sent to all members.

CONTACTS - Material for the newsletter and membership questions should be addressed to Stew Meyers phone 301-365-1749. E:mail gets immediate attention. stew.meyers@erols.com

Maxecuter web site: www.his.com/~tschmitt



W

W

F1

Wing Camber curve

F3

1.5" Dihedral Under wingtip

W

W

W

W

pattern for 1/32 balsa rear window backing

Bond paper

Plastic outline

All "B" series sheet parts are 1/20
 All "N" series sheet parts are light 1/8
 All "F" series sheet parts are light 1/16

B0

B1

B2

B3

B4

B5

B6

B7

B8

B9

B10

B11

N1

N2

N3

Nose block of light 1/8
 Make 2 each of N1, N2, N3
 Make the hole in N1 and N3
 to suit your nose button, 1/4"
 as drawn.

C

C

B8

B7

B6

B5

B4

B3

B2

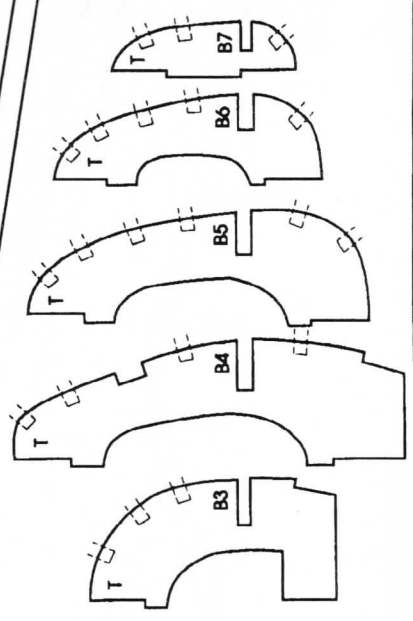
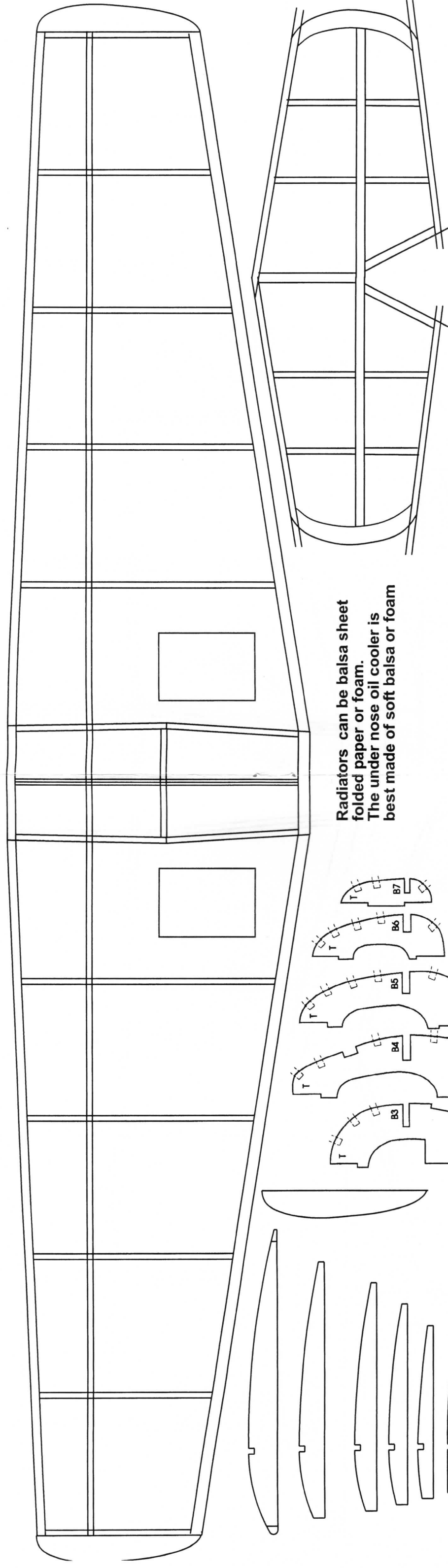
B1

B0

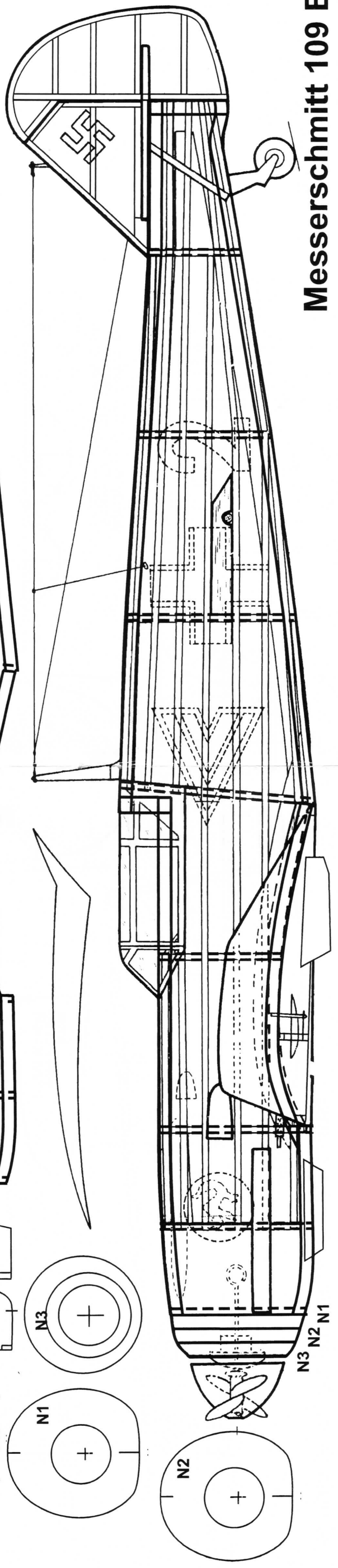
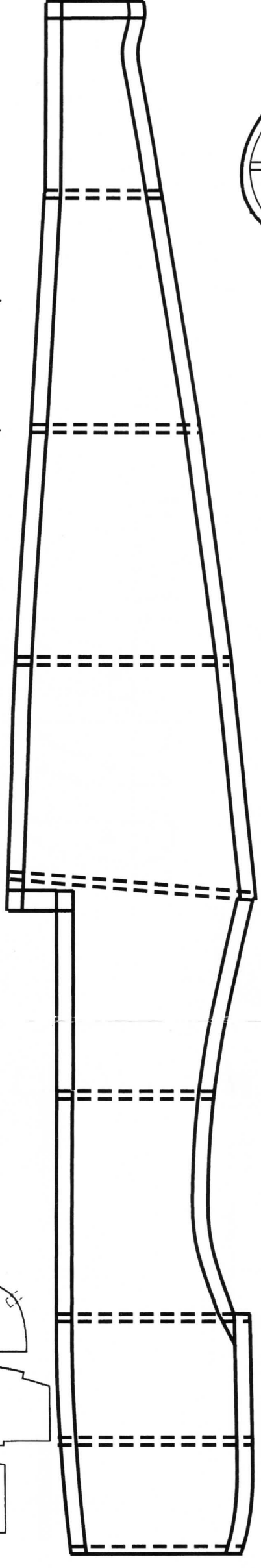
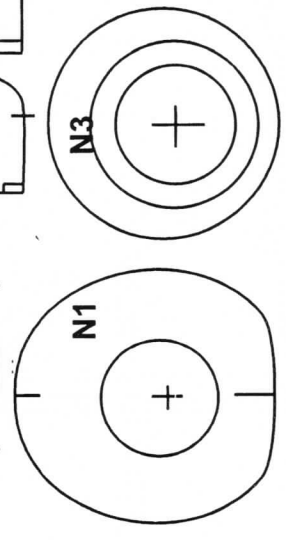
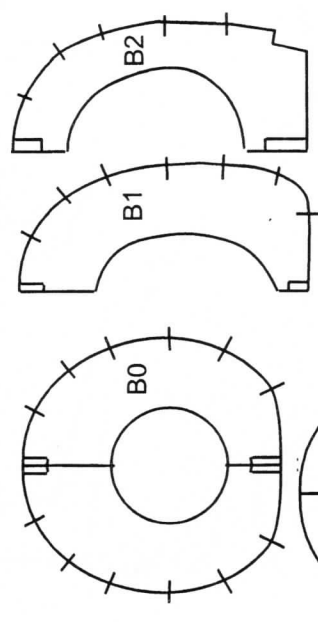
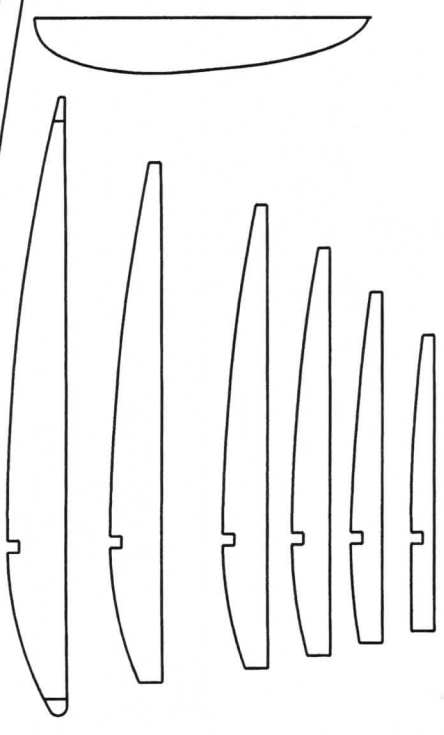
12

Guilow's P40 modified by Doug Griggs

13



Radiators can be balsa sheet
folded paper or foam.
The under nose oil cooler is
best made of soft balsa or foam



Messerschmitt 109 E