

Hatz of the month:
Ebensperger Classic
 ...Boonville, New York

My name is John Ebensperger and I have Hatz Classic s/n 37. which has been flying for two seasons now. Construction was started in 2002. So over a period of about 17 years picking away at it, I completed the build.

I'm running a Lycoming O-320-E2D 150 hp behind a Sensenich wooden 74EM54 propeller. The forward and rear cockpit have full flight controls with airspeed and altimeter only in the front pit. The rear cockpit is mostly steam gauges, XCOM transceiver, Microaire xponder newly added 406ELT, tailBeaconX and AV30-E by Uavionix.

Both my sons are Marines so I took some colors from the dress uniform, deep blue, red and 'white' which are all Stewarts System waterborne finishes. I'm thinking about running a red stripe down each side of the fuselage.

My DAR let me put the X in my tail number as my sons names



are Mark and Mike. I was fortunate to find N200MM available.

I keep the plane on a 2800 foot grass runway near Boonville NY, 1NK7, where this picture was taken. It's about an hour from home and I am looking to move the plane closer.

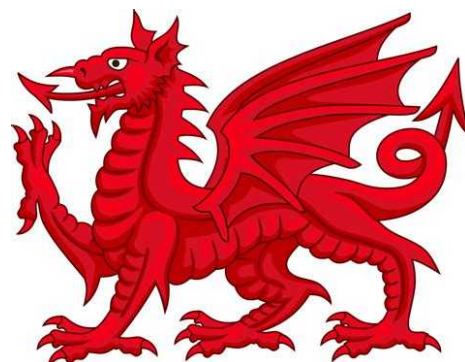
I'm swamped at work and am building a new home so I have only just completed my 40 hour required test flight program. I live in upstate New York and things are really beginning to cool down for any open cockpit adventures. Plans are to venture out and get the cross-country skills tuned up next spring.

I plan on taking out the

vacuum system and replacing the DG with another AV30-E and use that as my DG. I may change over to wood ailerons as well if I can find the time to do that. The prop I have is a climb prop and I have toyed with the idea of adding a couple inches of pitch on a new prop to improve cruise speed.

The red patch on the cowl is a decal of a Welsh Dragon (Griffin). It's on both sides of the cowl. My Mom was 100% Welsh and passed on before I could take her for a flight. So symbolically she goes every flight. (see more pictures on page 4, Ed.)

John Ebensperger



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The View from Above

Jeff Orear, President
Hatz Biplane Association



The Latest News from the President's Classic Project

I'm currently working on my ailerons, and reaping the benefits of working with aluminum from my RV6A build experience. Like riding a bike I guess. **Jeff**



One of the forms used to make the ribs. It's 3/4 Masonite that I have hardened the edge I'm bending against with super glue.



I had to make my spars in two pieces as I did not have a long enough brake. I tried going to a heating and cooling contractor, but since I'm using 2024 T3 aluminum, the radius they could only bend them with was too small and caused cracks. I've primed the area where the splice was riveted.



Press for corrugated skins.

- 4) Fly to more fly-ins/breakfasts.
- 5) Begin tailwheel transition.
- 6) Attend the Hatz annual fly-in at Brodhead and see old and new friends.
- 7) Attend Oshkosh, and again see old and new friends.
- 8) Have the best time ever at numbers 6 and 7!
- 9) Do the best I can as president of the HBA.

How about you? How will you bust out from the confines of, you know, that virus thing we dealt with all last year? I think we all have a bunch of catching up to do with our lives after the debacle called 2020. I hope that your projects keep nearing completion and that those that have completed airplanes get out and enjoy these wonderful airplanes. The new year is filled with hope and potential that is unprecedented.

Have a very Hatzy New Year everyone! Like Mike Patey always says, "Back to work!!"

**As always,
Remain Calm and Hatz On!**

Jeff Orear

New Year's resolutions. We all make them with good intention. Some are harder to stick to than others. How many times have you promised to eat healthier, only to fall off the wagon and order that quarter pounder with cheese? Or see the number of times you get exercise diminish over the months following New Years. We can be so weak and fickle.

But then there are resolutions that are much easier, and I might add enjoyable to adhere to. Yes, I am referring to those associated with aviation. Sacrifices and commitment must start somewhere, right?

So here go my aviation resolutions for 2021:

- 1) Get the Classic project to the ready to cover stage.
- 2) Fly the RV to visit family more, now that there is a Covid (I was trying not to use that word anymore) vaccine.
- 3) Replace all the firewall forward hoses on the RV along with other long-term maintenance.

The Latest News from the President's Classic Project



The corrugated skins were made on a press that a fellow builder and secretary of the HBA, Rick Schultz passed on to me. This shows the die. One groove is where the corrugations are pressed, the other lines up and spaces them. Very important to get that first corrugation pressed perpendicular to the edge of the skin.



I made a template to keep the "swoop" of the aileron outboard trailing edges consistent. Instead of the wood trailing edge insert, I'm using flap trailing edge stock from Vans. I've notched it strategically to avoid the

corrugations and where rivets will be located to aid in bending the arc in it.



Trailing edge taped in place and spar tack clecoed to the top skin. I'm building the ailerons upside down, top skin flat on the build table.



Lower skin has been tack clecoed in place. I have a piece of 3/4" shelving material cut to the shape of the top skin that the aileron assembly is sitting on. The trailing edge clecoes go through the bottom skin, the trailing edge stock, the top skin, then into the shelving material to keep things clamped down to keep the aileron flat. I used the shelving material to raise the assembly off the table which allowed excess bottom skin to extend past the trailing edge at the "swoop".



This shows how the excess bottom sheet hangs past the upper skin trailing edge. I've flipped it over to mark and trim the bottom sheet to size. To the right I'm using some 3/4" aluminum angle to keep the top skin flat at the tip.



Homemade forming tool used to close the forward and aft ends of the corrugations. The closure of the corrugations is not specifically called out on the plans. Many builders leave them open. I just like the closed look, like a Waco. Plus, I'm a glutton for punishment!

The Latest News from the President's Classic Project



Notching tool from Klein Tools



Technique is to tap the tool first vertically.



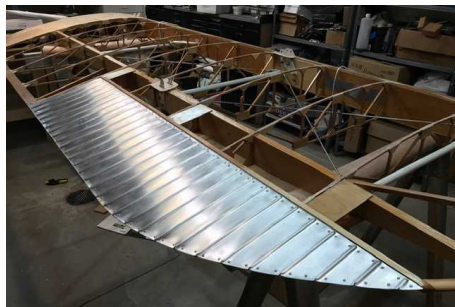
Then continuing to tap, roll the tool toward the edge of the skin. I have a piece of .025 steel at the edge of the sheet/corrugations to aid closing the corrugations.



Very light coat of self-etching primer. Mar-Hyde in this case.



Hinge drilled to the wing prior to riveting. T-nuts retain the screws, and the flanges of the T-nuts are encased in micro fill thickened epoxy to prevent pushing them out on final assembly.



One done, three to go...



continued from page 1



More images from John Ebensperger, top to bottom: John with granddaughter Emma, a freshly-painted wing, rigging crew: Joey, Todd, Vinnie and Chris, using a hoist so he could disconnect the landing gear to lower the plane to clear the garage door opening on moving day.



HATZ BIPLANE ASSOCIATION

LATEST CLUB NEWZ



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From the editor: It's been a busy month for me, between my work, a death in my family and all this entails, and the birth of our fourth grandchild, Sasha Lucia Misegades, a little girl. Life is indeed bitter-sweet at times, but it is great to be alive and able to enjoy God's splendid creation from 500 feet up. Since the December issue I have received so much new material that I can not possibly fit it all into this issue, even at 16 pages. Thanks to all who have graciously sent me material. Since I want to make sure you benefit from the wisdom of fellow members during the winter building season (at least here in the northern hemisphere), I will immediately start on a February issue and turn this around ASAP. As a teaser - HBA member **Bernie Willis** of Wasilla, Alaska, an experienced restorer of bush planes, sent me a lengthy, detailed comparison of three major covering systems, PolyFiber, Stewarts and Oratex, that I know you will enjoy reading as did I. At this time **Sun 'N Fun** remains a go here in the Southeast, and most pilots I know are ready to be done with the whole flu thing and get back to flying and being with flying people again. I recently was at the historic **Smith Field** in Fort Wayne, Indiana, and was impressed by the FBO and **Sweet Aviation**, which had a fleet of modern training aircraft including one with the 3rd wheel on the right end - a Super Decathlon. Based on what I saw and heard there, sport aviation is in surprisingly good shape in northeastern Indiana, all things considered. On that note I will end these scribbles and wish you all success in your shops and in your cockpits in the coming month. **Aim High, Fly Safe Kent Misegades**



Steen Skybolt? No, it's a sleek Hatz Classic, s/n 1001, N415TR, owned by **Andy Velazco** of Jonesboro, GA. Andy reports he's planning on repainting it this year. Thanks, Andy!

The NEWZLETTER is published on a regular basis by the American Hatz Association dba Hatz Biplane Association, founded by Lorin Wilkinson, Past President, Emeritus, for Owners, Builders and Lovers of the Great Little Biplanes Inspired by John Hatz.

More than **50 YEARS of Happiness**

Hatz CB1 Kelly-D Hatz Classic Hatz Bantam Vintage Hatz

'round the patch
by Ted Tracy
Hatz Biplane Association



ey folks, this month I'm going to wrap it around the pattern, carrier style, short base to final, level the wings and flare. Better jam on the brakes and pull the mixture right in front of the shop door of one Manfred Maurer of Manville, Ohio. That was a close one !

This time around we'll look in on Manfred and his Hatz Classic #193, to see how things are getting along. Wow, this guy knows how to get things done. Manfred is a prolific GA enthusiast and serial homebuilder. If the beautiful RV 7 he's already turned out is any indication, this Hatz is gonna be a stunner. No pressure though, Manfred !

Like a lot of us Manfred chose to start with the wings, and he's already finished the entire rib set and most of the center section for the upper wings. He also has the spars milled, the compression

tubes fabricated and machined the drag/anti-drag wires. In the accompanying photos, we can see his progress on the wing set and how he is using the center section as a fixture to guarantee alignment of the wings as they go together.

Next up is where Manfred really supercharged this build. Enter Don VanRaay at VR3 Engineering. Most around these parts have, by now, heard of VR3 and the work they have done in supplying the homebuilding hobby with a huge time saver, in the form of their laser cut fuselage kits. Our friend Rick Schultz was instrumental in getting VR3 to engineer a fuselage kit for the Hatz Classic. After a two year gestation period, while Don and VR3 crew engineered the laser cut tube kit, and with Rick "waiting patiently", he finally received the first kit for the Classic.

The visit that Manfred and I had to Rick's shop to see this awesome build was more than enough to convince Manfred that this was the only way to go. His enthusiasm got him on the phone to VR3 immediately, and he managed to negotiate a "Twofer" deal for us, with a savings based on shipping two kits to one location.

Unfortunately I couldn't pull the trigger at that time, but as often happens, when one door closes, another opens. Through



'round the patch

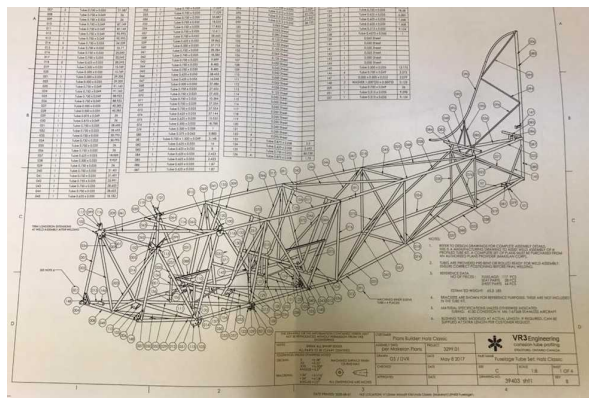
by Ted Tracy
Hatz Biplane Association



phone conversations with Don, Rick learned that VR3 actually had a complete airframe for a Classic all welded up and sitting on the shop floor as a demonstrator. Rick let Manfred know about this new turn of events, and after some "convincing", Don was persuaded to part with their demo Classic, and the fuse was on its way to Ohio.

This is really one beautiful piece of engineering! The kit comes from VR3 with its own dedicated plan set, which actually provides more detail on the fuselage construction than the Classic plans themselves. Having seen an unassembled kit, I can attest that you can't get a credit card in the gaps on the tube clusters, and the welding on this particular fuselage is nothing short of art!

One pleasant surprise was learning that even after a kit sale, VR3 has stayed in contact with



the kit builders, and learned from their experiences with the kits. They then incorporate improvements learned in the field into the new kits as they go forward.

Continued development, not every outfit has the commitment to follow through "after sale" like this, in an effort to continually improve their product. As the "Ancient Pelican" would have said, Tip 'O the Ole Hatz Topper to Don and VR3 for their outstanding Hatz Classic kit!

Well, I hope you enjoyed meeting Manfred, and touring his project. I guess I'll hit the fuel pump, switch on the mags and push the starter.. and go look for another Hatz builder that we can pester into letting us inside their shop for a look around.

Until then, cheers!
Ted T

(For details, see VR3 Engineering, Stratford, Ontario, Canada, www.vr3.ca)



Hatz CB-1 N1929H Serial #699 by Bob Mott Hatz Biplane Association



Like many of you, I grew up dreaming of being a pilot and flying a biplane like the ones I saw in movies like “The Great Waldo Pepper,” or “The Blue Max.” With the price of vintage biplanes being what they are, I knew, maybe like John Hatz, that my best hope of affording my dream was in an experimental biplane. Unlike John Hatz, my wood & metal working skills set peaked about the time I got a C-in shop class in 8th grade, so I knew I would be buying and not building one.

To back up a little, I finally earned my pilot's license in 2007 in a C-150 at age 41, and then achieved my tail wheel endorsement in 2008 with a Cub Club. I spent the next few years building time in the J-3, culminating in 2012 when I flew it

to Oshkosh for the 75th Anniversary Cubs 2 OSH celebration. In 2013 I managed to secure a hangar at the Bayport Aerodrome Society in Bayport, Long Island, and the final hurdle was crossed towards making my biplane dream come true. I then began looking in earnest for a Hatz because the design appealed to me for its affordability, docile handling characteristics, and most of all its vintage biplane look.

After observing pilot friends purchase airplanes and reading all the “how-to” articles in AOPA and EAA magazines you would think I would have been very well prepared for buying my own airplane. Boy, would you be wrong! In a fit of biplane-happy fever, ‘caveat emptor’ flew right out the hangar window when I found a beautiful Hatz for sale in Ohio on Barnstormers, and basically bought it sight unseen.

An A&P friend of a friend happened to know the owners and reported the plane to be in

great shape with just a small fuel tank leak. The owner was also willing to deliver it all the way to Long Island, so what could possibly be wrong? Famous last words...

To make a long painful story short, I discovered much more than just a “small” leak. That leak lasted until all but 5 gallons of fuel remained in the 24-gallon tank, but that was not the worst. When I went to taxi it a day after delivery, to get a feel for it prior to my check out ride, I discovered it would only run on one mag. Upon removal of a bottom spark plug, what seemed like a gusher of oil poured out onto the hangar floor.



Hatz CB-1 N1929H Serial #699 by Bob Mott Hatz Biplane Association

Upon further tear down, we found the pistons looked like chocolate frosted cupcakes from all the blow-by baked on them and we discovered the crank journals were scored. This with just 375 hours SMOH by the amateur builder. The best guess is it most likely was the result of a dirty re-build. I was amazed the owner was willing to fly it all the way to Long Island like this. Of course, this was all on me because a proper pre-buy would most likely have revealed many of the faults.

Seven long and sometimes frustrating years later, and with my shop class skills reluctantly improved, the engine has been professionally rebuilt and upgraded, the fuel tank removed, repaired, reinstalled, the center section recovered, plus numerous other small modifications and repairs she is back commanding the air once again.

My Hatz, serial #699, had originally been built for well known aviation artist Sam Lyons by retired Grumman Aircraft employee Vincent Miglino in



Sam Lyon's painting of the Hatz he originally owned.



2005. Interestingly Vincent lived most of his life just a few miles from me before retiring and moving to Gray, Georgia, in 1985. There he built multiple aircraft, including two Hatz biplanes, before his passing in 2010.

My Hatz was his second CB-1 and was built with a Lycoming O-290-D2. It has since been rebuilt with an O-320 crank, nickel carbide plated cylinders with O-320 exhaust valves, and a cross over stainless exhaust system from Sky Dynamics, and a Casper Labs spin on oil filter adapter. It has a Tennessee wood Propeller, Cleveland Brakes, Matco tailwheel, Valcom radio, Sigtronics intercom, and a Bendix transponder.

After finally passing her condition inspection by my I.A. Gino Dinucci, I then needed a checkout from a CFI to satisfy my insurance company. There is no better guy then Craig Sampson, whose day job is flying a Global Express and weekend hobby is flying T-6s for the American Airpower Museum, to put me



Left: rebuilt O-290 ready to go back on. Above: engine builder Joe Erale (right) and I discussing how we will recover the center section. Below: first engine run in seven years.



and the plane through its paces. After engine break-in he did just that, and I now have about 15 hours on her. I was enjoying every minute until the temps began dropping below tolerable here in the northeast, and now I will have to commiserate with other open-cockpit types all winter waiting for spring to come.

Living my dream of flying an open-cockpit biplane could never have come true without the help and camaraderie of the men and women of the Antique Airplane Club of Greater New York and the Bayport Aerodrome Society. I am forever in debt to my friends, too numerous to name here, for all their hands-on help and encouragement over the years, first in learning how to fly and then in rebuilding my Hatz. I can't

Hatz CB-1 N1929H
Serial #699
by Bob Mott
Hatz Biplane Association



Bob Mott's first flight from the rear seat.

say enough good things about them!

Both organizations are based out of the Bayport Aerodrome (23N), one of the few municipally owned public grass airfields in the country with its pristine 2,700' runway on the south shore of central Long Island. The Bayport Aerodrome Society was formed out of the Antique Airplane Club of Greater New York in 1975 to



save the aerodrome, built in 1945, from becoming a housing development. Lucky for me they were successful, and in the 1980s built 24 hangars for exclusively antique and classic privately-owned aircraft. The all-volunteer Society acts as a living history museum that is open to the public and hosts many events during the year like pancake breakfasts and car shows for the public, and this year will host the 58th Annual Antique Airplane Club of Greater New York Fly-In.

I am lucky to be on the Board of Directors of the Society and

the President of the AACGNY, and even more fortunate to call Hangar 18 my home away from home. We are a great destination spot for aviation enthusiasts with over 45 vintage and classic aircraft on display.

I hope you stop in if you are ever in the area. If you are flying in don't let the New York airspace scare you, we have our own cut-out under the Class Charlie and, believe it or not, you can fly into and out of Long Island without a radio from any direction if you read the charts carefully.

Sincerely, Bob Mott

Antiquer News...page 13



The Eaglet



THE BAYPORT AERODROME SOCIETY NEWSLETTER

Volume 13, Issue 10

December 2020

The author, Bob Mott, is the editor for the outstanding newsletter of the Bayport Aerodrom Society.

HATZ BIPLANE ASSOCIATION MEMBER SHOPS & EVENTS



Mark Marino, HBA Director North and creator of the Hatz Bantam sent these pictures of his latest progeny, a 7-cylinder Verner radial-powered beauty he calls the **"Radial Flyer"**. That is the famed **"Lark of Duluth"** in the back of his hangar in the top picture, a flying replica Mark built of the **Benoist XIV** that provided the first heavier-than-air airline service anywhere in the world. Follow Mark's progress on the Radial Flyer at hatzbantam.com Thanks, Mark!

UPCOMING EVENTS

April 9-11, Uncle John's Fly-In, Triple Tree Airport (SC00), Woodruff, SC, USA, tta.aero

April 13-18, Sun 'n Fun Aerospace Expo, Lakeland Linder International Airport (KLAL), Lakeland, FL, USA flsynf.org

May 7-9, Spring Wings & Wheels Fly-In, Old Kingsbury Aerodrome (85TE), Kingsbury, TX, USA pioneerflightmuseum.org

July 22-July 25, Hatz/Pietenpol Fly-In, Brodhead Airport (C37), Brodhead, WI, USA, eaa431.org

July 26-August 1, EAA AirVenture 2021, Wittman Regional Airport (KOSH), Oshkosh, WI, USA, eaa.org

September 1-5, Antique Airplane Association Homecoming & Fly-In, Antique Airfield (IA27), Blakesburg, IA, USA, antiqueairfield.com

September 20-26, Triple Tree Fly-In, Triple Tree Airport (SC00), Woodruff, SC, USA, tta.aero

November 12-14, Fall Wings & Wheels Fly-In, Old Kingsbury Aerodrome (85TE), Kingsbury, TX, pioneerflightmuseum.org

Please send details on any event that attracts biplane people to the newsletter editor, Kent Misegades.

You could call this month's report from the SGAF workshop "CB-1 Rib-Building for dummies", the author being the dummy. Well, not completely. My past experience at building ribs was limited to a weekend-long SportAir Workshop I organized for my EAA chapter (1114) years ago, and to twice attending the workshops in Oshkosh with my two sons.

In addition, I studied the popular references on the subject in my library, for instance Tony Bingelis' books, Paul Poberezny's (Acro Sport Inc.) "The Techniques of Aircraft Building" and the EAA's manual on Aircraft Building Techniques - Wood. The great HBA forum and builder web sites provided additional tips and tricks.

I am impressed by the effort some builders put into their rib jigs! Mine were pretty basic, making use of shelf board material covered with acrylic plastic, and short sections of spruce cap strips glued with CA (super glue) onto the acrylic over a copy of the rib plans.

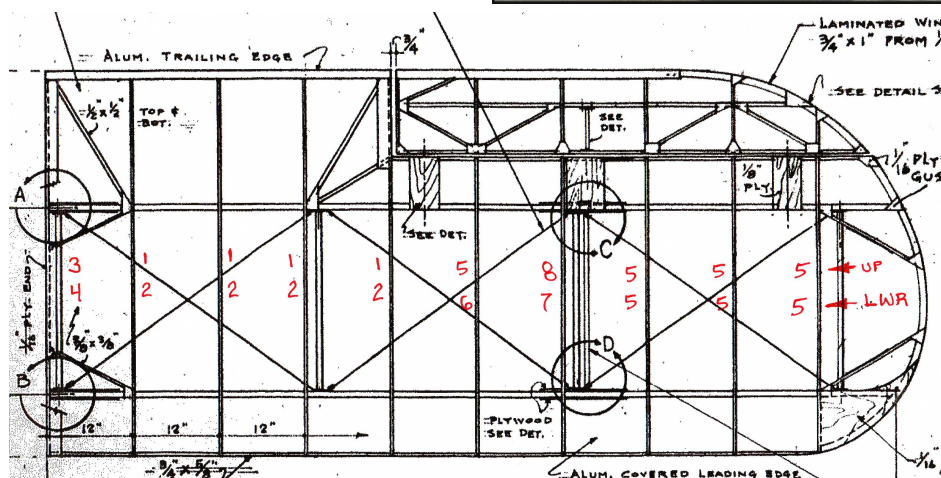
I made in fact two such jigs, one for the sections inboard of the ailerons, and one for the aileron sections. It took me awhile to figure out that there are not two different types of ribs, but actually eight, and a total of 40 ribs (excluding the center section) as listed here:

1. inboard, no doublers, upper L+ R, total 8 ribs
2. inboard, no doublers, upper L+ R, mod for cables, total 8 ribs
3. root upper, like type #1 but w/ 1/8" doublers both spars, 1/16" ply end cap, upper L+ R, total 2 ribs
4. root lower, like type #2 but w/ 1/4" doubler fwd. spar, 1/8" doubler rear spar, lower L+ R, total 2 ribs
5. aileron, no cables, no doublers, 4 x upper L+ R = 8, 3 x lower L+ R = 6, total 14 ribs
6. aileron, like #5 but with cable mod, lower only L+ R, total 2 ribs
7. aileron, like #6 but with 1/4" doublers both spars, lower only L+ R, total 2 ribs
8. aileron, like #5 but with 1/4" doublers both spars, upper only L+ R, total 2 ribs

After making the first trial rib, which turned out fairly well, I took it to Jerry Stadmiller of BIPE, Inc. a well-known restorer of Wacos and Stearman in Andrews, North

Carolina, in the far western end of my state. (I used the occasion to meet up with my brother from Franklin, Tennessee, to spend a day rafting the Ocoee River and another day flying gliders at the great Chilhowee Gliderport near Benton, TN). The image shown below of a stunning red Waco is an example of BIPE's outstanding workmanship.

Jerry showed me the jig they had created for Waco ribs, which was simpler than mine yet equally effective. He demonstrated their "fingernail" test on all the corners of the gussets to assure good adhesion, and how a simple bench grinder can be used to trim off the excess from overhanging gussets. Jerry and his younger colleagues were impressed by the CB-1 plans,

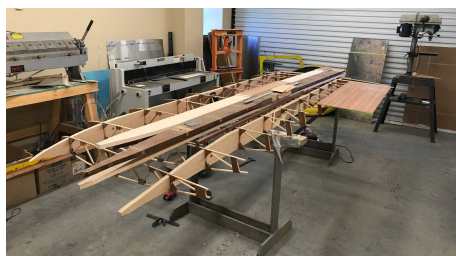


Rib types and locations for the CB-1 wings.

**Hatz Topics from the SGAF
by Kent Misegades
Hatz Biplane Association**



Above: Simple tabletop router made from a hand router and some wood scraps. The end of a Shop Vac hose was inserted in the top and held near the router bit. Below: router template and several of the nose pieces prior to finish sanding.



Top to bottom: Jerry compares my first rib to the jigs he's made for other aircraft; BIPE Inc.'s well-equipped shop at the Western Carolina Regional Airport (KRHP) in Andrews, NC; Jerry shows his well-honed skills on my rib.

which they said were far more detailed than what they were able to find from the original Waco factory. Jerry also suggested a few changes, based on their experience restoring classic

biplanes. I will report on those in the next issue.

During construction of ribs, I jotted down the following notes as I ran into problems:

Materials initially purchased from Aircraft Spruce (in Peachtree City, GA) consisted of a standard bundle of 140 x 1/4" x 1/4" x 4' spruce capstrips, 1 x 1/4" x 4' x 4' sheet of domestic birch plywood, 1 x 1/16" x 4' x 4' sheet of domestic mahogany plywood and a quart of T-88 two-part epoxy glue. The birch was sufficient for the nose pieces and little triangular wedges for the trailing edge, but I ran out of capstrips and mahogany plywood. Another 10-20 capstrips and another sheet of 1/16" x 4' x 4'

mahogany plywood were necessary. The total cost for all this was about \$500. I had some business near Atlanta and made the pickup myself to save on shipping.

To make the nose pieces I converted my hand router into a table router (plenty of examples to be found online) and made a template from shelf board. After practicing a bit and making an enclosure around the router with cardboard, duct tape and my shop vac, I was able to knock the parts out quickly and accurately in a few hours.

I suppose everyone struggles with the thin mahogany plywood gussets - there are so many of them! According to my calculations, there are $17 \times 2 = 34$ of these for each of the standard "type #1" rib, with a few more or less for the other 7 variants. That makes a total of around 1,400 of these little guys to draw onto the plywood sheets, which I cut into sections 2 foot long by 6 inches wide. I made small templates for



A plastic box with partitions for small parts made an ideal means of storing gussets while making the ribs.

each gusset from mat board, the stuff used in picture framing. Each one of the 2' x 6" sheets of plywood were then filled with gusset outlines using a Sharpie, making sure to align the wood grain in the direction of the cap strips, although I am not sure that grain alignment for plywood here makes much difference.

The individual gussets were rough cut on my electric scroll saw and then rough sanded on a combination bench/disk sander placed near the rib template. Final sanding of the gussets took place when I was ready to glue them in place, which helped to reduce any final sanding once the epoxy adhesive had cured. The scroll saw and sander also came in handy when cutting and fitting



Above: std. rib jig, flat "back side" rib jig and spar jig (top to bottom).

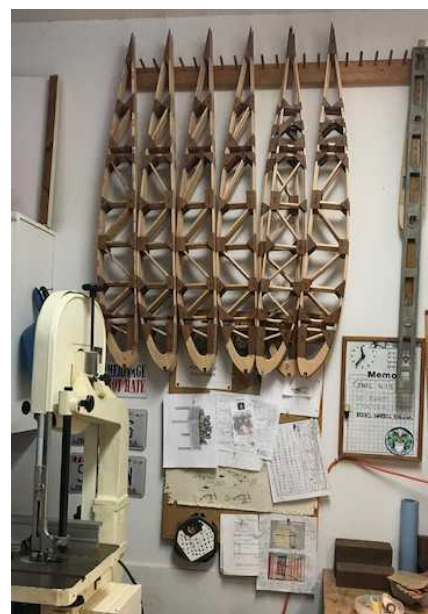
the spruce sticks. I did think about using a CNC router, water jet or laser table to cut the gussets, but I like doing things first the hard way as builders did in the 20s and 30s. It gives me a greater appreciation for what builders faced in the 20s

and 30s. I I ever build another Hatz though, I would consider cutting the gussets with a CNC router, water jet or laser. Or perhaps make the entire rib in one shot from a sheet of birch plywood using a CNC router or water jet.

I have seen rib construction guidelines that call for glue only on the gussets and not on the ends of spruce diagonals, but I applied some at every joint anyway. Many such handbooks were written back



Above: Aileron rib during construction. Right: Completed ribs hung safely out of the way.



when the primary glue was casein or resorcinol, which required very flat and clean mating surfaces compared to T-88 and similar epoxies. Typical was also to hold the gussets in place with those tiny tacks or staples, which is what is done at the EAA workshops. I didn't like either tacks or staples, so I followed others' examples and bought a few dozen small spring clamps, which worked quite well.

On every rib there were 3-6 gusset corners that would not behave and needed a small tack, which I removed after curing. Learned the hard way - twist the tacks with a pair of pliers before pulling. Sometimes the epoxy would adhere so well to the tack that when removing it a corner of the gusset would be pulled free.

Gussets were glued onto one side of the rib, which was allowed to cure for 4-6 hours before gently prying the rib off the jig with two flat-headed screw drivers. Another simple jig made

in the outline of the rib was used to hold everything flat as the gussets were added to the lower side. I eventually was able to make two such ribs every day, and things went fairly fast.

The size and position of the spar openings should obviously be accurate and consistent for all ribs. For this I constructed another jig which was simply another piece of shelf board onto which I glued pieces of cap strips at the outer extent of the spars as well as another one at the location of the leading edge notch. The spar openings in each rib were finely sanded using a fine-toothed file until it fit easily but snugly onto the jig. Obviously the jig was modified depending on each of the 8 different types of ribs.

My Quality Control included assuring a good fit on the spar jig, a fingernail test on all gussets to make sure the glue held under loads where it should, a gentle twist to listen for any potential cracks or loose gussets, repair of an

occasional crack, and a fingertip test around the rib's outer perimeter to eliminate any overhanging parts. A stack-up of the ribs showed only minor variation, as it should, coming from the same jig. A further check was done by weighing each rib using a digital postage meter to see if any rib's weight varied greatly from the average, about 180g. The largest variance was 5 grams, or 3%, which is surprisingly low considering we're dealing with amorphous materials, and, as the first sentence described, a dummy as builder.

From just this very early stage of construction I have learned a great deal and am happy with the results. They make the task ahead less daunting: fabrication of wing fittings. Here I will take a short cut by modelling them in CAD and having my son, a design engineer, metal fabricator and A&P, cut them out using a laser at his work.

Aim High - Fly Safe
Kent Misegades

CLARK Y



Why the Clark Y?

*Ever wonder about the airfoil chosen by John Hatz for our favorite airplane, the Hatz? The Clark Y was one of a number of airfoils developed in the 1920s by **Virginius Evans Clark** (February 27, 1886 – January 30, 1948), an officer in the United States Army, a military aviation pioneer, and a World War I engineer. In 1913 Clark joined the Aeronautical Division, U.S. Signal Corps. In 1914, Clark attended MIT for an aviation engineering course. In 1917 Clark became the Commanding officer of McCook Field founding the current Aeronautical Systems Center. While at McCook, he was the co-designer the VCP-1, and Engineering Division TP-1 aircraft. Later he worked for the Dayton-Wright Company, Consolidated, Fairchild and Hughes Aircraft. Clark's Duramold process would later be used on the Spruce Goose. The Clark Y has been used with success on a variety of aircraft including the Lockheed Vega, Spirit of St. Louis, Ilyushin Il-2 Shturmovik, Hawker Hurricane, Northrop's Tacit Blue stealth demonstrator and on the Waco and Hatz, of course. Good choice, John Hatz!*



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