
✈️ EAA CHAPTER 32 NEWS ✈️

Jim Bower, Editor

March, 2004

Another bird is about to leave the nest...



Joe Sargent (I knew from the stripes on the tail) is deeply involved in the final assembly of his new RV-9A. After this photo was taken, Joe moved his airplane to another hangar. By this time, he may have already had it signed off!

Join us on March 28 at 2:00 pm for our next meeting at the ARC. Bring food and come earlier (noon) for some chow!

INFORMATION HOTLINE

314-286-9932

CALL THIS NUMBER FOR INFORMATION ABOUT
UPCOMING EVENTS

February Meeting

February 22, 2004

The pre-meeting food fest fell flat on its face due to lack of participation. Other than a few snacks, there were no consumables, so most of the crew departed to Kilroy's for sustenance.

The meeting began approximately at 2:00 PM with the Pledge of Allegiance. Some new members and guests were recognized.

Ken Blackburn gave his report on the rental hangars. A proposed rule change was discussed, which would change the current fees to a sliding scale structure. Wall storage (wings, etc.) would cost \$10.00, and a disassembled project would cost 1/2 the normal hangar fee. Some discussion arose over the definition of a "project", and it was agreed that any aircraft without wings attached qualified, because if wings were mounted, the airplane would take up a full-sized space. Further, flying HOMEBUILT aircraft have priority for hangar space over production aircraft and projects. This was voted on, and it passed.

Treasurer Gale Derosier spoke about the building utilization document, and changes that were made. Details were available at the meeting; see Gale if you are interested. After another brief discussion it was agreed to remove all aircraft from the ARC prior to fueling/defueling operations. Another discussion arose about hangar access and keys. There are approximately 10 keys to the hangar, but it is uncertain as to whom should keep those keys other than the current ARC renovating crew. See any chapter officer for hangar access.

At the time of the meeting, 50 members had not paid their 2004 dues, which were due on January 31. Get the lead out, gang!

K.Z. Zigaitis, our safety officer, has been sent on a long posting to Pax River, Maryland. Consequently, we are looking for someone to take over, at least temporarily, that important job. This person would be responsible for safe operations in the ARC, at Young Eagle rallies, and other chapter functions. Please contact Laura Million if you are interested.

Two Young Eagle events are scheduled at this time: May 8 at Washington and June 12 (International Young Eagle Day). Please consider participating in these events.

Again, with regards to food. For the March meeting, bring a "potluck" dish, but in April, barbecuing will once again commence. Hot dogs, brats, and burgers will be on the menu. Again, bring a side dish. Donations are requested as well. Soda is provided, as usual.

Anybody and everybody is welcome at ARC work days, as well as the Mustang II project. For the Mustang, see Gerry Geiger.

There will be an Executive Committee meeting immediately following the March General Meeting.

A round table discussion was held, featuring several RV builders, Bill Collette, Rick Galati, Dave Hyde, Joe Sargent, and Jim Bower. Topics discussed ranged from why they chose their particular aircraft (and the materials involved), engine choices, and what is involved in building.

The meeting was adjourned at approximately 3:00.

EAA 32 MARCH SPEAKER

Ken and Dot Kotik and their L-4

A very special treat awaits EAA 32 members for the March 28th meeting. Ken and Dot Kotik of St. Peters, MO will arrive at 1300 hours with their L-4 Liaison Aircraft. This L-4 is an Oshkosh award winner and can be view most weekends at its beautiful Creve Couer hangar. Ken has graciously volunteered his time to come over and talk to us EAA 32 peoples about his L-4 and his adventures while flying up to and from Oshkosh. His talk will make you realize Ken loves flying "low and slow." You may want to ask him about the sawdust and the six wings he is presently working on in his studio (basement)!!!

Editor's Corner

Thanks to all my buds for electing me secretary. FYI, I don't do shorthand and I refuse to take dictation, so everybody must speak slowly and plainly from now on!

I don't know about anybody else, but I'm starting to hold out hope that warm weather will soon be upon us. I don't mean the sweaty, strangling heat we have come to know and love here in St. Louis, but the spring zephyrs that waft gently across the newly green lawns and trees, and don't screw us up too much in the traffic pattern!

Lots of stuff on tap this year, so stay tuned! Demos and round table discussions at the meetings, Young Eagle events, ARC open house, and a projected seminar by aircraft wiring expert Bob Nuckolls. More on that to come later on.

Please join me at the March meeting to kick off spring the right way!

Newsletter Deadline: The deadline for submitting articles, pictures, want-ads, etc. is two weeks prior to our regular general meeting. Please submit these items to the newsletter editor via e-mail (jimbower@hotmail.com), snail-mail (10350 Toelle Ln. St. Louis, MO 63137), or phone (314-869-8971).

Learning As We Go

mr. bill

Get well wishes are in order for Captain Al Donaldson who has been hospitalized. Al, there is a beautiful McDonnell Aircraft framed poster in the ARC that is for you. It is signed by four of the Tuskegee Airmen. Please accept it with sincere thanks from EAA Chapter 32 for providing us with Major Wesley Hurt, the excellent guest speaker at the Christmas Party.

A big THANK YOU to those RV men who stepped up to the front of the ARC and shared their experiences and facts of the building process (a Lycoming engine for \$17,000). It was refreshing to see every one actually talking about AIRPLANES.

The **APRIL** meeting will focus on the COMPOSITE AIRCRAFT. Greg Smith and his Pulsar will be there for our pleasure. Calling Captain Jude and the GIRRRLS to step up to the ARC platform and bring out any show and tell items you would like to share.

The **MAY** program will include discussions of the ALTERNATIVE ENGINE BOYS AND GIRRRLS. Gale D with his Chevy V-6, mr. bill and his Revmaster 2100cc VW engine, Greg S. and his Jabiru (or Gary J maybe) and the GIRRRLS are invited with their top secret engine. Captain Dave D will be hanging his new Subbie by then so it looks like an interesting couple of months ahead.

In a previous article I asked if anyone had experience “flying instruments” with the new Garmin 196 Global Position System. The family of Garmin GPS’s is on the back page of the latest TRADE-A-PLANE and the current issue of KITPLANES. Well, in my travels I found an individual who was wondering too. His friend had just purchased the Garmin 196, the GPS with the instrument panel display on its LCD (Liquid Crystal Display). With one person flying simulated instruments off the Garmin 196 and the other acting as safety pilot these two pilots went and discovered that if the pilot made very slow flight control inputs to correct banking tendencies of the aircraft, that the GPS 196 could be used as an instrument panel to fly “instruments” into and out of the bad weather. Nice to know and have if your cruising in a Cub or Champ and the visibility became obscured.

Does anyone know St. Louis Pilot John Mozley who reported to the TANA WIRE MARKERS that their balls save his life? You see the ad in TRADE-A-PLANE for the high powerlines wire markers that have big bright orange balls made by a company in California, MO. These balls come in sizes from 9 inches up to 54 inches! WOW!!! While boating on the river last year I notice all the wires that cross the Mississippi and remembered several years back that a St. Peters pilot hit some high voltage wires that were spanned across the mighty Mississippi River and flipped his aircraft into the river.

I wanted to pass on some of the statements that my Line Instructor Pilot has placed on my training records. As you can see I must really be impressing him:

- This captain is really not much of a has-been, but more of a definitely won't be.
- This captain will go far-and as soon as he starts the better.
- Works well under constant supervision and cornered like a rat in a trap.
- Since my last report, he has reached rock bottom and has started to dig.

I have two more days of flying so I am sure the best reviews are yet to come.

Safe landings.

Items for sale:

1. Complete Acro Sport plans including the Super Acro wing rib plan for only \$40.
2. The plans for a Mini Max only \$40.
3. A solid built framework of the horizontal and vertical tail section of the Mini Max \$60. Save \$100's here.
4. Metal prop for maybe a Cessna. Markings are KLIP-TIP METL Prop HCM 6948 McCauley Ind. Corp. Dayton Ohio SER. NO. C12171 for \$100.

Call Henry J. Oughton III at 1-314-838-9050. Leave a message if I am out.

Calendar of Events

Every Saturday – ARC building

March 28 – 1pm – Food and Social

2pm – General Meeting, after meeting speaker, Ken Kotic, with his L-4 Liaison aircraft

3:30pm – Executive Committee Meeting – Finalizing the Budget

April 24th – Young Eagles – Smartt Field

April 25th – 1pm – Food and Social

2pm – General Meeting

Dates to Mark on Your Calendar

May 8th – Young Eagles at Washington MO

June 12th – International Young Eagles Day/Smartt Field Open House

July 27th – August 2nd – AirVenture – Oshkosh

September 4th, 5th and 6th – St. Louis Fair and Air Show – Spirit of St. Louis Airport

October 2nd & 3rd – Young Eagles at Creve Couer for the St. Louis Escadrille Fly-In

October 2nd & 3rd – Bob Nuckolls “Aeroelectric Connection” seminar

So You Want To Be An Aircraft Designer?

(continued)

From Russ Erb, EAA Chapter 164, Edwards, California

Spring Steel Landing Gear

Spring steel landing gear change the paths of the landing loads into the fuselage from 3 points to 2 points for each side. A tapered rod landing gear further reduces it to 1 point. Because of these differences, changing the landing gear style would require the redesign of major fuselage structure. According to Bob Barrows, large steel plates would be required to distribute the loads, which would add more weight.

Even if spring steel gear were installed, I'm not convinced it would be an improvement. As the name says, the landing gear is a big spring with very little damping. As a result, you will probably bounce more landings than with the as-designed damped landing gear, which allow heavier landings with the dampers preventing the landing gear springing the airplane back into the air.

The purported benefit of spring steel landing gear is reduced drag over tubular landing gear, especially landing gear with exposed bungees, such as on the Piper Cub. There would only be a slight difference in drag between the spring steel landing gear and the Bearhawk gear.

Stinson 108 Landing Gear

The existing landing gear is plenty big enough. While I am not familiar with the Stinson 108 landing gear, I am told that it is heavier. Besides, unless it would be a pure bolt-on replacement, using it would create more work than it would save, because you would have to redesign the landing gear attach points on the fuselage.

Fabric Covered Wings

This is not as easy as just leaving off the aluminum skin and covering the wing in fabric. Have you ever noticed that fabric covered wings always have two struts per wing while aluminum wings only have one strut? The difference arises from differences in how the torsion (twisting) loads are handled.

An aluminum skin will resist torsion. To see this, try twisting a soda can. It will resist the twisting, even if you partially flatten it so that it looks more like an airfoil. Now try twisting a leg of panty hose. The fabric offers virtually no resistance. To prevent twisting, a fabric covered wing requires two struts, one to each spar.

Two Strut Wings

As mentioned above, two struts are only needed with fabric covered wings for torsion resistance. A second strut adds nothing but drag and weight to an aluminum covered wing.

36 Foot Wing Span

The current wing span is about 33 feet, so a 36 foot wingspan would be an increase of 1.5 feet on each side. I'm not sure of the reason for this proposal. Perhaps more wing area for shorter takeoffs and landings? The Bearhawk already has as good or better STOL performance than most any aircraft out there, such as the Cessna 180. Perhaps looking for a higher gross weight? On the contrary, if you extend the span without changing the structure, you would actually DECREASE the maximum gross weight because the wing bending moment would increase because of the longer moment arm. The highest bending moment for a strut braced wing is at the strut attachment point. If the wing span is increased without moving the strut attachment point, the longer wing would increase the bending moment. The bending moment might be reduced somewhat by moving the strut attachment point outboard, but this has the drawback of worsening the bracing angle of the strut. As the bracing angle changes, the tension loads in the strut and the compression loads in the wing between the strut and the fuselage increase. Additionally, since the portion of the wing between the strut and the fuselage is longer, its resistance to buckling under compression is reduced. The bottom line is that if you are interested in increasing the wingspan with the idea of increasing the maximum gross weight, you will need to totally redesign (beef up) the wing structure.

Steel Wing Struts

A steel strut with the same tensile strength as the specified aluminum strut would be of a smaller cross section. While this might seem advantageous for reducing drag, it is weaker than the aluminum strut in compression (i.e. more likely to buckle) because of the smaller cross section. Wing struts are occasionally under compression, such as when you are sitting on the ground, the occasional hard landing (though you never do that, of course), and during that nasty big down draft that bounced you off of your seat belt last week. Because the wing strut is very slender for its length, it is much weaker in compression (buckling) than in tension. Reducing the cross section size (i.e. making it more slender) makes the problem worse.

Switching to a steel strut may or may not reduce the weight when sized strictly for tensile loads. When a steel strut is sized to handle the compression loads, it will very likely be heavier than the aluminum strut. Either that or you will have to add a jury strut as seen on Piper Cubs, which adds back the drag you were trying to get rid of.

Then there's the corrosion problem. Seen a few Piper ADs lately? The Bearhawk runs the aileron control cable up the inside of the wing strut. If you set up a steel strut the same way, water would soon get inside the strut and start rusting it away from the inside. Tough to detect and even tougher to repair. Alternatively, you could seal the strut by welding the ends closed, and then run the control cable externally through fairleads on the back of the strut, as was done on early Piper Cubs. However, this will probably add as much drag as you saved. Additionally, if you get into icing conditions, you're going to get some serious flight control problems really quick. Incidentally, such a configuration is no longer certifiable under current FARs for just that reason, which can be interpreted to mean that it's not a very good idea.

Extruded Wing Spars

I don't see the benefit in this, unless you happen to have the equipment to make the extrusion dies and do the extruding. Even then, you would not want the spar to have a constant cross section from root to tip. The spar design is beefiest where the greatest loads are (at the strut attach point), and thins out where the loads are smaller. Any constant cross section extrusion strong enough to handle the loads at the strut attach point will be heavier than the built-up spar. Either that, or the extruded spar will require extensive machining to remove the extra unneeded weight. The built-up spar is actually a very simple and effective design. I think it is even simpler than the RV spar which uses bigger rivets (3/16") and has multiple webs. Of course, the RV spar has to be bigger, since the wing is cantilevered.

Tricycle Landing Gear

You're on your own for this one. Mike Meador tells me "We will never live to see the day Bob caves in to this." That tells me that your first problem would be to find a new name for your aircraft, since a "Tri-Gear Bearhawk" or a "Tri-Bearhawk" or even a "Bearhawk-A" are all oxymorons. The next (and biggest) problem would be redesigning the fuselage structure because the landing gear loads are now in totally different locations. Also, the tail would probably be over 10 feet tall. Take a look at the Piper Tri-Pacer to get the idea. Might be tough to get in your T-hangar door as well.

Besides, if you are building a Bearhawk because of its STOL capabilities or its ability to operate from grass or unprepared strips, there are numerous reasons why a conventional gear (the proper name for a "taildragger") arrangement is better, which I won't go into here.

If you're concerned that you don't know how to fly a taildragger, find an appropriate instructor and go take some lessons. You can learn how--consider that virtually every pilot up through World War II learned to fly taildraggers. If they could do it, then you can too.

Wooden Airframe

This question has actually been raised. Simply replacing the steel tubes with similar sized sticks of spruce won't cut it. Find a toothpick and a similarly sized nail. Try to break each one with your hands. Which one broke? Which didn't? Point made?

While it's true that large aircraft have been constructed of wood (e.g. the Hughes HK-1 Hercules, a.k.a. the "Spruce Goose"), typically they use a totally different construction method. The DeHavilland Mosquito used a monocoque or semi-monocoque construction where wood formed the outer shell of the aircraft and this shell carried the loads, much like the shell of an egg. The Corby Starlet fuselage is built from sheets of plywood reinforced by a wood truss. The majority of the loads are carried through the skin acting as shear panels. The primary purpose of the truss is to keep the unsupported panel areas small enough to prevent buckling.

Another type of wood construction uses a large number of stringers held in place by wooden formers, covered by fabric. The Sopwith Camel was typical of this type of construction (Many Fokker aircraft used welded steel tube construction--Anthony Fokker was a pioneer of this method). Most Guillow rubber-powered airplane models use the stringer and former construction.

Both of these methods are significantly different from the method used in the Bearhawk fuselage. Thus, choosing to change to a wooden fuselage would necessitate designing an entirely new fuselage. If you really want to do that, you might as well design your own airplane.

Elimination of the Front Strut on the Tail

I'm not sure what would be gained by this. The left and right horizontal tails attach to the fuselage by a tube slipping over a tube, held in place with a bolt. While this setup handles forces sufficiently well, it doesn't handle moments very well. It's actually rather similar to the wing root, where the pin (bolt) carries the forces and wing strut counteracts the moments. The three struts on the horizontal tail keep it from flapping up or down.

Because the horizontal tail is fabric covered and thus has no load bearing skin, it is not exceptionally stiff in torsion. Therefore, two struts are used on the bottom just as with a fabric covered wing. Both the forward and aft strut systems are necessary. The forward strut is large enough to take loads in tension and compression. The aft struts are thinner, but only need to take loads in tension because of the upper and lower struts. Removing any of these struts would compromise the torsional rigidity of the tail.

All Aluminum Tail Feathers

You could do this, but you would be designing the whole thing yourself. The structure would be much more like the wing than the current tail feathers. Aluminum tail feathers would definitely be more complex, take longer to build, and might even be heavier.

All Aluminum Flaps and Ailerons

The only benefit that I could see for this would possibly be in a bush flying scenario where the flaps and ailerons might frequently be hit by debris. Of course, by that same logic, you'd probably want to cover the fuselage in aluminum too. Even then, you're trading fabric tears (temporarily repairs in an emergency with duct tape) for aluminum dents (which may be more difficult to repair). Aluminum covered flaps and ailerons would be heavier, since the aluminum sheet is heavier than the fabric. The ailerons would also pick up additional weight because of the increase in ballast required to balance them.

This will launch you down the path of redesigning the fuselage. If your idea was to increase the payload, see the previous discussion on increasing the wing span.

Electric Flaps

Electric flaps are usually mechanized by placing a jack screw in place of the flap lever. This adds one more gadget to fail on you at the worst time. One advantage of electric flaps are that you can set them up to be able to stop at any deflection. Even so, with four positions available on the manual flap lever, this benefit is minimal at best. My experience has been that manual flaps can be set to a different position faster than electric flaps if desired. You might find the faster manual flaps a benefit if you like to retract the flaps quickly after landing to "plant" the airplane on the ground.

So What Should I Do?

As you can probably see by now, your best bet if you don't consider yourself an aircraft designer is to build your Bearhawk according to the plans for the parts where the plans exist. There are plenty of non-structural areas and areas not specified in the plans, such as the engine installation and the instrument panel layout, where you can express your individuality with your own design, while still feeling confident about the primary structure around you. If you still feel that the Bearhawk is not right for you without some major design change, then maybe you should be building some other design.

From the Desk of the President

Last week, some friends invited my daughter, Amanda, to their house to build and launch a rocket. When I asked her if she would like to do that, I got the usual pre-teen answer, "I guess" (insert a sigh and shrug of shoulders here). Well, I thought it would be cool. We arrived at their house on a windy Sunday afternoon just as they were setting up the launch pad. Michael took Amanda in and had her pick out a color. Of course she chose purple. Then he took the pieces and painted them for her. While they dried, we went outside to watch the first launch of the day. This rocket belonged to a 12-year-old girl and was painted pink, blue and green with flower stickers on it. She nicknamed it "Flower Power." This rocket shot about 1000 feet into the air. Because of the winds, it drifted about a quarter mile away. The kids (as well as the grown-up kids) chased it. My daughter came back excited for the next launch. We ended up launching about 10 rockets that day, including my daughter's rocket that launched twice. She had the time of her life. She expected the rockets to go 10, maybe 15 feet in the air. She had no idea how high they would go and how exciting the launch would be.

Do you remember the first time you watch or launched a rocket? Do you remember the first time you watched an aircraft take off or land? For those pilots, I'm sure you remember your first solo. I sure do. Since you are part of an aviation organization, at some time you experienced that excitement, whether as a child or adult and it sparked not only an interest, but eventually a passion. I see that excitement on the kids' faces after they have taken their first Young Eagles flight. I saw that excitement on Joe Sargent's face when he was showing off his RV at the ARC a few weeks ago. I assume I had that expression on my face after Bob Jude took me on a ride in his Lancair last summer. That's what makes EAA great, we share our passion with others.

What is your passion? Why are you with EAA? What brought you to Chapter 32? Have you help someone get interested in flying? Have you help someone get interested in building an aircraft? In the next few months, we are going to be asking people to help in various areas. We have several Young Eagle's events planned for this spring and summer and more to come. We have the Smartt Field Open House in June where we should take the opportunity to show the public what we are about. We have the St. Louis Fair and Air Show in September where we have the opportunity to meet the general public. Help us spark the excitement of aviation in others. It doesn't take much, just the interest and the spark does the rest.

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