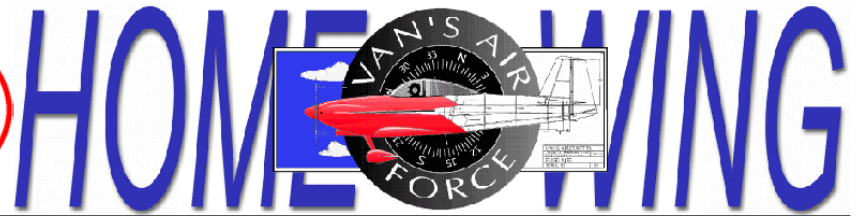


Experimental Aircraft Association

Chapter 105 Portland, OR

Twin Oaks Airpark—7S3 www.EAA105.org

The Purpose of EAA Chapter 105 is to Promote Aviation Education, Construction, Recreation and Safety for Enthusiasts of All Ages.



Next Meetings

- **Jan 13** — Chapter Meeting to Review the Bogardus Little Gee-Bee project restoration at Dick VanGrunsven's shop at Sunset Strip. Map and info on page ???.
- **Jan 20** — Board Meeting: 7:00 PM at John Halle's office (Stoel Rives), Portland. Info on page ???.



Newsletter Deadline — Jan 22

- Newsletter article contributions and ads are welcome anytime, but may be held to a later issue if received after **Jan 22**.

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122.75

J. Rion Bourgeois, Chapter President

Holiday Banquet and Lervold's Revenge

Jennie Hickman, Dru Bourgeois, Marcy Lange and Janet Wentz did the heavy lifting, and made the holiday banquet a rousing success. And thanks again to the Hickman's for hosting the party, which was attended by at least 100. It has been almost a year since I presented the Broken Prop Award to Randy Lervold at a chapter meeting. I qualified myself in June, and knew darn well that Randy was eager to present it to me at Arlington, so I hid the prop, avoided the dreaded presentation, and promptly forgot all about it. It had been well hidden, but Bob Stark rooted around in the hangar and found the damn thing, so Randy had his revenge, presenting it to yours truly at the end of the chapter awards presentation at the holiday banquet amid much snickering. Those who missed the banquet will just have to do without a recitation of how I qualified. I must confess that I had taken great delight in presenting the award to Randy, so I guess you could say that in the case of broken prop awards, what goes around comes around.



New Year's Resolutions

The new board of directors has resolved to accomplish much in 2005. We intend to outfit a new chapter project hangar at Twin Oaks Airpark. The goal is to provide a heated hangar where we can work on chapter projects and chapter members can finish their own projects and conduct annual condition inspections in a fully equipped hangar/shop. It is hoped that

a project hangar will move the chapter along in its project oriented progression, as well as provide a focus for impromptu gatherings for those who are flying, and those who want to get their hands dirty

Breakfast KP Duty

Saturday, January 1st, 2005

7:00 AM	9:00 AM
John Elford	Chuck Curtiss
Greg English	Gene Frye
Sam Fonteno	Dunstan Fandel
Pete Forsyth	Todd Farmer
Walt Foster	Zane Gard
Warren Frain	Darrell Gerrard
Aaron Frechette	Keith Gover
Ed Fredrickson	Robert Grace

Saturday, February 5th, 2005

7:00 AM	9:00 AM
Steve Harris	Ron Graff
Allen Hawkins	Dick Guarnero
George Henderson	Scott Gustafson
Jim Hoak	Carl Hay
Ralph Hudson	Cas Hoefman
David James	Dennis Jackson
Paul Johnson	Charles Kaluza
Bill Kenny	Stephen Kautz

Note to Volunteers who cannot serve: Please arrange replacements for yourselves, or contact Len Kauffman. lakauf@comcast.net or 503-885-1920

on chapter projects. We intend to put in a loft to house the chapter library, and keep a coffee pot busy. We have put down a first and last month's rent deposit on an end hangar in the new row currently under construction. We would prefer something bigger, but that is all that is currently available.

Speaking of chapter projects, the Smithsonian Air & Space Museum has agreed to display George Bogardus' Little Gee Bee, and expects it by the end of 2005. Dick VanGrunsven is spearheading this chapter rebuilding project at his private hangar at Sunset Airpark. That will be the site of the January meeting, to view this historic aircraft, and solicit assistance for the project. The chapter will again host the NW RV Fly-in at Scappoose on the Saturday before Father's Day, and will host a Poker Run out of Twin Oaks this summer.

Several board members are volunteering to help the Hillsboro International Airshow with experimental static and aerial displays. The show will be held the weekend of September 9-11, 2005 (the weekend before the Reno Air Races). The headliner act this year will be the Thunderbirds. We expect several chapter members to fly in the show, either in formation or loose trail, like last year. How would you like to open for the Thunderbirds? If you are interested, see John Halle.

The chapter will also be applying to host the EAA's B-17 again. We lost our opportunity last June when her landing gear collapsed in Van Nuys. Keep your fingers crossed that we get another opportunity this year. Joe Blank has volunteered to be the chapter's fly-out coordinator, so expect more flying activities this year. Among sites discussed have been Arlington and Salmon Arm. Joe is soliciting suggestions.

We also intend to continue our traditional first Saturday

Thermodynamics and Applied Material Sciences in Plexi-land

Or What Size to Drill the Holes in the Canopy



Amit Dagan

One of the dreaded stages of building the RV has got to be the cutting and drilling in the acrylic material. Not only is the canopy an expensive part, it is also a very different material than the aluminum the builder has become accustomed to, so the fear is a natural "fear from the unknown".

The trepidation is further augmented by traditional horror stories of cracks that appear either upon the drilling of "the last hole", or while the airplane was just "sitting there". A famous crack was reported over the North Pole while Jon Johanson was flying his beloved RV-4 through one of the world's coldest air masses.

Plexiglas is a trademark for a thermoplastic acrylic plastic, thermoplastic means "becoming soft when heated and hard when cooled". It is common knowledge, that while working with the canopy, heating it will help reduce chances of cracking. Some builders arguably overdo it, working on their canopy in a sauna-like environment, but as they say: "Better safe than sorry". But don't over heat your canopy: at approximately 180 degrees F it will soften or lose its structural properties! On the other side, the cooler it gets, the more brittle your canopy becomes.

Now, what about that dynamic part? Well, all materials expand and contract to a certain degree due to changes in temperature. Therefore allowances must be made for

these changes in the construction. Acrylic sheet is subject to greater dimensional change, than the aluminum with which it is used in the construction of the canopy. In fact, the ratio between the two coefficients of thermal expansion is greater than three.

In other words, if you had equal lengths of aluminum and Plexiglas, that were subjected to the same change in temperature, the Plexiglas would move more than three inches for every inch the aluminum material would.

Having fitted the canopy in a warm environment, and then flying through cold air, which makes it not only brittle but also causes changes in dimensions, not to mention the vibrations it is exposed to...no wonder Jon Johanson's canopy gave in.

Allowing the Plexiglas canopy to "float" over the aluminum frame, so that the screws that attach the two parts to each other don't exert lateral force at the contact point, requires that you drill the holes in the Plexiglas to a larger size than would normally be required. In fact, calculations show that for a 30" length of canopy, and a 100 degrees F change in temperature, a safe size for hole in the Plexiglas (for #6 screws) is 0.25".

Using a unibit to enlarge the holes in the Plexiglas, and very short lengths of R/C fuel line with O.D. of 0.25" as a soft bushing around the screws achieves that. This centers the screws in their holes, while allowing for the movement between the Plexiglas and the aluminum frame. Don't torque the screws too much! That will negate the entire purpose of the exercise. Where there is no aluminum right under the screw head, use a tinnerman washer to reach across the enlarged hole.

PS, Jon's old canopy has been replaced with a new temperature normalized canopy.

122.75 continued on page 6...

Little "GEE BEE" Restoration Project

Dick VanGrunsvan



In past Chapter 105 newsletters and brief meeting presentations, I have mentioned the Bogardus LITTLE GEE BEE aircraft which we received as a part of the George and Lillian Bogardus Estate. I mentioned that this aircraft, despite its relative historic obscurity, played an important role in the creation of the Experimental Amateur-Built category in which we license all of our wonderful homebuilt airplanes. I had also mentioned and written about our efforts to restore this aircraft for museum display. Restoration efforts thus far have been done by the VanGrunsvan brothers and Laird Smith; as I have not been persuasive enough to enlist a larger army of volunteers. Along with these restoration efforts, I have been corresponding with museums to find a worthy resting-place for this important aircraft. I am pleased to announce that the Smithsonian National Air and

Space Museum has agreed to accept and display this aircraft at their new Udvar-Hazy facility on Dulles Airport, Washington, DC. I don't think that we can do better than that!

The LITTLE GEE BEE was offered to the National Air and Space Museum rather than the EAA's museum in Oshkosh, because it was felt that this would be more consistent with George Bogardus' wishes for the airplane.

By way of review, the Little Gee Bee's claim to fame is that this is the homebuilt aircraft which George Bogardus flew to Washington D.C. in 1947 (under special flight permit) as the climax of a petitioning effort to persuade the CAA to license homebuilt aircraft. The success of this mission was the beginning of the popularity of post-war homebuilts, thus the beginning of the EAA, and "the rest of the story". The reasons for the early retirement of this aircraft, and its languishing in obscurity for over 50 years, is an interesting story which we will chronicle in these pages after all of the archival materials from the Bogardus Estate are cataloged and researched.

The ancestry of the Little Gee Bee is also an interesting story, one which should be of interest to all homebuilders in Western Oregon. It starts with another notable and under publicized homebuilder of the 1930s, Leslie Long. Les and his brothers lived on the Long homestead just north of Cornelius, OR. In the late 1920s, Les began building airplanes, about the same time as the better known Heath Parasol and Pietenpol Aircamper homebuilts were gaining acclaim around the country. High cost of aircraft engines was an even greater obstacle in those depression years than it is now. Thus, the Heath used a modified Henderson Motorcycle engine, and the Pietenpol used a converted Ford Model A engine. Les went one step further and made his own two cylinder opposed engine, the Long Harlequin, using cylinders from an old Harley Davidson motorcycle engine along with a crankcase and crankshaft of his own design and manufacture. He sold kits for this engine, along with completed engines. During the first half of the 1930s, he built several airplanes; experimenting with different wing mounting arrangements to achieve the best performance and construction ease. He concluded that the wire braced low wing was the best (cantilever wing construction was not considered practical for homebuilders of that era), so his last design was the Low Wing Longster (later known as "Wimpy") which flew in 1937. In 1939, a young man named Tom Storey built a slightly redesigned version of this aircraft for Lee Eyerly in Salem. This aircraft was used for only about 40 hours of testing before it was dismantled and put in storage. As we know, all West Coast lightplane flying was curtailed during the war. After the war, this airplane was put on sale and acquired by George Bogardus. The original 40 HP Cont. engine was replaced with a C-65, an extra fuel tank added, and other upgrades. The name Little GEE BEE was taken from George's initials.

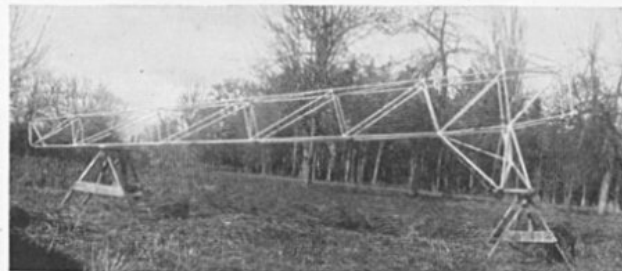
So, that is a brief summation of how the Little GEE BEE



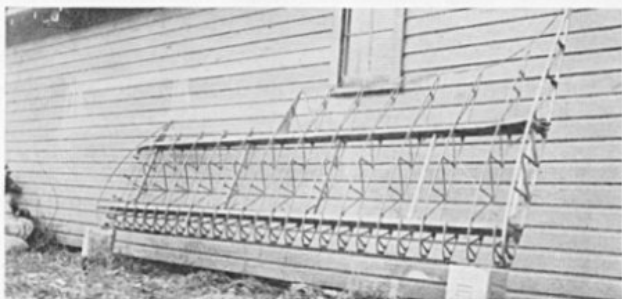
evolved and entered its place in history. While it was in its own right a good little airplane, this was not a prerequisite to its achievement of fame. It just happened to be available to the right person at the right time. However, there is further background, which I find to be equally interesting. While Les Long was a talented designer and builder, he was also an outspoken advocate of the cause of the homebuilder, the "little guy in aviation". He wrote many articles for POPULAR AVIATION (FLYING) and other magazines, not only about his air-



Side elevation of the Low-Wing Longster showing the fuselage fairing methods and the landing-gear streamlining.



The simple yet sturdy fuselage structure of the Low-Wing Longster.



The uncovered wing structure of the Low-Wing Longster, showing the builtup ribs, the edging and spars.

planes, but also in advocacy of more freedom for homebuilders. As you may recall, the CAA was created in 1926 and set up procedures for certifying and licensing airplanes. It took a while for this to be completely implemented, so in the early 1930s, there were many homebuilts being made and flown. Before long, the feds began to clamp down, making it nearly impossible for amateurs to fly their homebuilt planes. That is, except in the states of Oregon and Utah, which had implemented State Licenses for airplanes. So, Oregon became the haven for homebuilders. In addition to his writings, Les Long also chaired a loosely knit organization of homebuilding advocates called the Amateur Aircraft League. Concluding a 1937 POPULAR AVIATION article about his new Low wing plane, Les wrote:

"Amateur building interest is not as high as it once was, due of course to the unjust Federal and State Aviation laws, but it is hoped that the simplicity and low cost of this little job will get the old crowd back in line again. And speaking of unjust laws, the Editor has promised me space in an early issue for a history of our Oregon Aviation laws during the past 17 years. There will also be given a detailed account of our present excellent aviation law and what it is doing for amateur flying here, how it is administered and who does it and our plans for the future. The coming article should point the way for any state to have the freedom we have."

Les did publish the article on Oregon Aviation, but it had little effect on getting other states to follow Oregon's lead. When private aviation returned after the war, Oregon had abandoned its state aircraft licenses, so the homebuilders here were also grounded. However, their spirit lingered on. During the war years, George Bogardus had become sort of a protégé of Les Long. Together they conspired to form a new organization called the American Airmen's Association, with the hope of reviv-

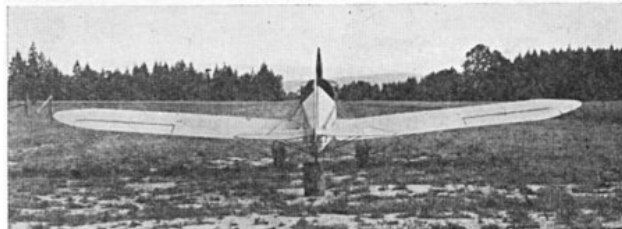
ing homebuilding interest after the war. Unfortunately, Les Long died in 1945, leaving George to take over the reins.

So, not only the airplane, but also the American Airmen's Association was Oregon born. These men and their airplanes may not have been widely recognized in their time, but there is no doubt that they were the spark that lit the torch, which the EAA and all of us have since carried forward. Lest we forget our origins, we need to get this aircraft restored and on display where it can take its proper place in history.

In the spring of 2004, restoration work on Little GEE BEE



A side-view of the "Hi-Low" monoplane.



Rear view of the wire-braced low-wing job.



The wire-braced parasol plane used in the experiments described here.

was started at my shop in North Plains. The badly rusted steel tube fuselage and tail surfaces were sand blasted and repainted, along with all of the fuselage control mechanisms and some wing fittings. This was a nasty job, one which we are glad to have behind us. However, this represents just the beginning of the process. The wood wings and ailerons need clean up, some wood re-furbishing, and re-varnishing. Of course, the entire structure needs to be re-covered with fabric. New windshield and canopy plexi-glass is need. The engine needs to be re-painted and assembled. There are obviously many other smaller details, which must be attended to. One consolation is that the aircraft need not be re-built to award winning quality. While it was originally well built, it was



not lavishly finished or painted. So, we plan to restore it to its original, authentic, lackluster condition.

Oh yes; I neglected to mention that I told the folks at the Smithsonian that we would have the restoration completed by the end of 2005. I feel that with a reasonable amount of volunteer help, this is a realistic goal. As I have mentioned before, I have made my North Plains shop available for the restoration work. This shop has sufficient space and most of the tools and equipment needed. I have sufficient knowledge of all of the skills needed for the restoration, but don't have time to do all of the work myself, nor to personally supervise all little details of the complete effort. What I am looking for is a cadre of volunteers including a few project leaders to manage projects such as wing restoration, engine assembly, re-covering of wings, fuselage, etc. If practical, a manager could take a project such as engine assembly to his own workshop. We're open to help and suggestions.

I mentioned that the fuselage cleaning and painting was messy work. However, even this work was enjoyable because of the camaraderie and sense of accomplishment. I hope that a number of you can find some spare time, and interest, to join us in the work, as well as the coffee, hamburger and Chili lunches; or whatever can be added to the fun. And, your handiwork is destined to hang in the SMITHSONIAN. Such a deal!

The Chapter 105 meeting program schedule has, at my request, been re-arranged so that the January meeting can be held at my North Plains shop. This will give you an opportunity to see the Little GEE BEE airframe and learn more details about it and its restoration. We hope to begin an accelerated restoration schedule as soon as possible to take advantage of the winter and spring weekend "building season". See you there.

Dick VanGrunsvan

Do You Want to Win a KitFox?



EAA Chapter 517, Inc. in Missoula, Montana is conducting a sweepstakes



with a KitFox Model V which was completed in 1997 as the Grand Prize. Built

by a retired airline captain, this beautifully completed aircraft is powered by a Teledyne Continental IO-240 engine. This beautiful airplane, painted in a patriotic red, white, and blue scheme, has approximately 110 hours total time and is a 9+ inside and out. Pictures and full details about this airplane are available on the EAA Chapter 517, Inc. website: www.eaa517.org. In addition to the Grand Prize KitFox, 1st prize will be a Garmin GPS, and 2nd prize will be a Lightspeed ANR headset.

This sweepstakes is unique because Chapter 517 will only offer a maximum of only 4,000 tickets. The odds of winning will be based on how many ticket are actually issued. The Chapter hopes to receive donations for a minimum of 3,000 tickets to see an appropriate return on the generous donation made by one of our Chapter members. A donation of \$25.00 is requested for each ticket. The drawing for this sweepstakes will be held on March 5, 2005.

<http://www.eaa517.org/Sweepstake.htm>

...122.75 continued from page 2

of the month Pancake and Grits Breakfast, which we have been hosting for over ten years now. We are all looking forward to an interesting year, and if we can accomplish all of this, a rousing success. As you can see, there is plenty of opportunity for all of our members to get involved.



Pacesetter Props (the company) For Sale

- Carving Machine (tracer lathe)
- Hub Tracker
- Inventory of Hub extensions (4, 6 & 8 Lycoming)
- All Patterns (Cassidy designed)
- Glue beams & clamps
- Finish work table
- Contact Keith 503-628-0547



Chapter's RV Kits Sold!

Greg Halverson has a flying RV-6, but found himself in need of a project for the winter, so he has purchased the RV Tail and Wing kits that have been occupying the chapter hangar. He loaded the whole shootin' match in and on his Subaru and drove the pieces in one trip back to his shop in NE Portland. Thanks, Greg!



Chapter Volunteers — One Position Filled...

The Chapter Breakfast is a long-running chapter fund-raiser — and by now *northwest tradition* — that has paid our hangar rental, and provided funds for many other club events.

Thanks Brent

Brent Anderson is stepping down as KP Duty coordinator and Flying Calendar maintainer after handling those functions for many years. Thanks, Brent, for all the time and effort you've put for the chapter.

KP Duty Roster

Len Kauffman has volunteered to cover the KP Duty Roster function. Please help to make his task easier by making time to help when your name comes up in the rotation, or letting him know promptly if you'll not be able to assist. Len can be contacted at lakauf@comcast.net or 503-885-1920. **We'll assume you're available and willing to help unless and until you forward an opt-out message to Len or Randy Lervold randy@romeolima.com.** It's not hard work, and is a great chance to meet new folks, network, and often look at a bunch of *great* airplanes.

Aviation Event Calendar

Brent also maintained the chapter and fly-in calendars, our listing of upcoming events. If you're someone who follows the regional aviation events already, we could use your help in keeping our newsletter listing updated. If you'd be willing to assist, drop me (Benton) a note; it only needs to take as much time as you're willing to contribute.

Meeting Coordinator:

Randall Henderson

503-297-5045
rv6n6r@comcast.net



January 2005 Meeting

Program: Bogardus Little GEE BEE Restoration

Address: Dick VanGrunsven's hangar/shop
east end, Sunset Airstrip
9899 NW 316th Pl, North Plains

Date: Thursday, Jan 13, 2005

Time: 7:00 pm

The January meeting will be at Dick VanGrunsven's old 'skunkworks' hangar/shop on Sunset Airstrip, where Dick and a few dedicated chapter member-volunteers are restoring George Bogardus' historic Little GeeBee aircraft. George flew the plane from Oregon to Washington DC on multiple occasions back in the 1940s and -50s - trips that were instrumental in establishing the regulations that have since allowed us to build, maintain, and fly our homebuilts with relative freedom in this country. Should be fascinating from a technical as well as a historical perspective.

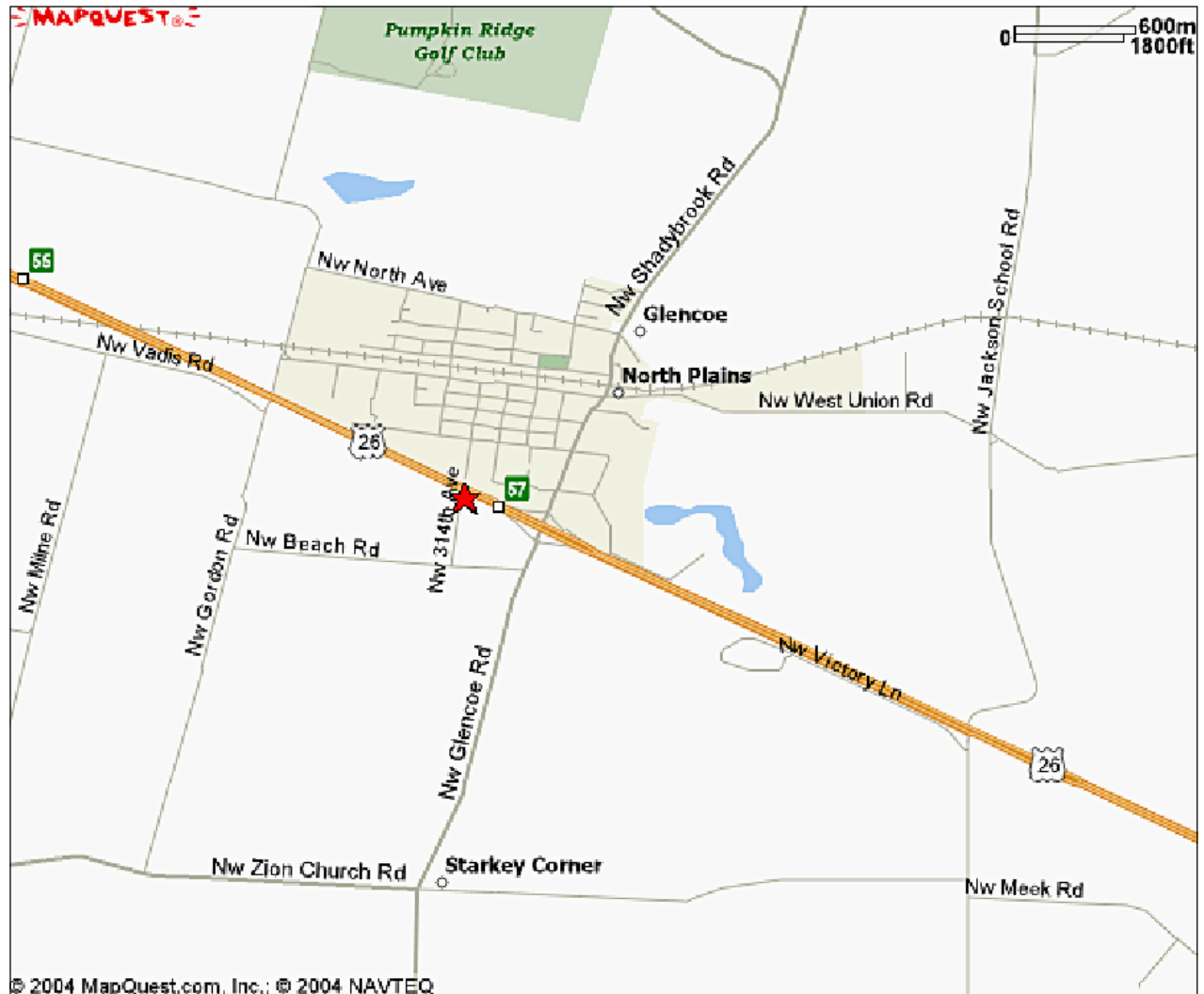
Driving directions:

From all points east: Take Highway 26 west to the Glencoe Road/North Plains exit. At the top of the ramp (stoplight) go left over the overpass. Just beyond the ARCO station, take a right on Beach Road. 1/8 mile down Beach Road and just past the grain elevator, turn right on 316th place. At the end of 316th place on the left

is Van's hangar/shop. This 'tiny URL' opens a map: <http://tinyurl.com/72789>

Flying in:

Due to seasonal (and darkness) factors affecting the airstrip, Van has asked that no one attempt to fly in for this meeting.



Future Meetings—Tentative!

**Feb — Dan Benua's RV-10 project,
West Skyline, Portland**

Mar — Van's Aircraft Factory, Aurora

About the meetings

Meetings are the second Thursday of the month, starting at 7:00pm, unless otherwise specified (here and in the newsletter), and are typically at the site of someone's experimental aircraft project or hangar.

The structure of the meetings is pretty loose. The first 40 minutes or so is generally spent socializing, eating chips and dip, and checking out the project. Then we get down to "business", with introductions of new members and guests, milestones, discussions of group issues, open items, and the host project. After that, it's back to BSing late into the evening.

Be sure to bring any tools, parts, etc. that you wish to sell, loan, give away, etc. And while you're there, throw a buck or two into the kitty, to help out the host for costs of purchasing the refreshments.

All are welcome, building or not, group member or not. Spouses too!

Meeting places are always needed. If you would like to host a meeting, you will be expected to provide:

- A location that will hold 30-50 people. In the summertime this can usually include just about any size shop as long as we can overflow outside.
- Refreshments. You can get away with a

couple of bags of chips and a few six packs of soda, or go all out and provide a full buffet bar with microbrew beer and smokies on toothpicks. We're all really there mainly to BS about airplanes, so don't feel like you have to go overboard with the food -- but feel free to do so if you want!

- A "kitty" -- a jar or bowl for folks to throw a buck or two into. No reason the host shouldn't get some reimbursement for all that food and drink.



• A program. Once we get through the business part of the meeting, you'll be expected to talk about your project for 20 minutes or so. For example, people usually like to know —

- Anything in particular that led you to choose this particular project?
- Any 'gotchas' to let others know about?
- Any cool techniques or tips to pass on?
- What would you do different next time?
- Have you used a TC? Do you plan to use a Flight Advisor?
- What kind of primer did you use? ;-)

Contact the Meeting Coordinator if you are interested in hosting a meeting.

IMPORTANT: The Van's Air Force Home Wing and EAA Chapter 105 newsletter is in no way a publication of Van's Aircraft or any other corporation. All products reviewed or mentioned are not necessarily recommended for use by the Home Wing or EAA Chapter 105, but are included for informational purposes only. All building or flying tips represent only the means by which the builder whose name is associated with the tip chose to build or fly his/her aircraft. Builder's tips are not meant to replace the plans and instructions from Van's Aircraft or any other company. All information is presented only as a source of information, and this newsletter is a forum for exchange and the sharing of ideas and construction methods only. NO responsibility or liability is assumed, expressed, or implied as to the suitability, accuracy, safety or approval thereof. Any party using the suggestions, ideas, or examples does so at their own risk and discretion and without recourse against anyone. The editors of the Home Wing and EAA Chapter 105 newsletters and the builder's tips submitters are not responsible for any product, incorrect construction, design failure, unsafe aircraft operation practice, nor any other peril. Any material printed within may not be reprinted without specific permission, and then should include credit to the original source and author. The Home Wing and EAA Chapter 105 newsletter is published monthly. A complimentary issue for new builders is available upon request. Mail or e-mail all subscriptions, ideas, tips, tricks, and articles to the newsletter editor.

Demystifying the Taildragger (Part One of Two)

Donovan Hammer



It seems strange to me that even to this day some of the aviation literature still refer to taildraggers as conventional gear airplanes. Yet there has existed for some time now generations of flight instructors and pilots that have never even flown an airplane of such configuration. The tricycle gear airplane has long since superseded the taildragger in the evolution of aviation to become the dominant species of the modern flight line. It has been a source of amusement for me to overhear conversations, both scornful and respectful, about what a different breed those taildragger pilots are. Admittedly, this is a mystique that many taildragger pilots may perhaps nurture for a certain public image, but to some extent it may also be perpetuated by the relative lack of understanding that many pilots share regarding taildraggers and how they differ from their tricycle relatives. It is true that if mishandled the taildragger quickly becomes the "tail dragon", but with understanding the taildragger can be easily tamed.

The root of the problem may lie both in the tricycle airplane's more favorable nature and the generations of flight instructors who have known no other world but the one shaped by the universal abundance of tricycle airplanes. When the design of the landing gear covers a multitude of our piloting sins, the techniques mastered by pilots of a bygone era become forgotten and atrophied. However, the taildragger demands from us a discipline and fidelity towards proper piloting techniques that are, in reality, not really so very different than what we should still practice even when flying our

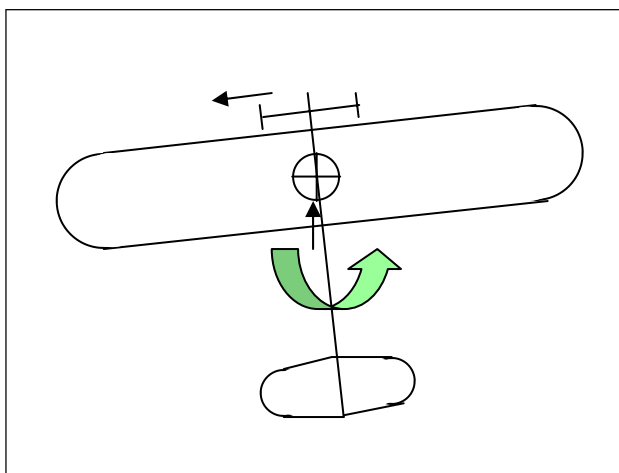
tricycle airplanes.

In this article I will cover some of the taildragger basics in order to explain its idiosyncrasies. To strive for brevity, I will only cover the basic landing operations because it is in landing the taildragger that we can capture the essence of what makes a taildragger different from a tricycle airplane. Although the finer points of taildragger take-offs are different, the tricycle gear pilot will find them familiar enough to perhaps obscure many of the salient points.

Taildragger Basics

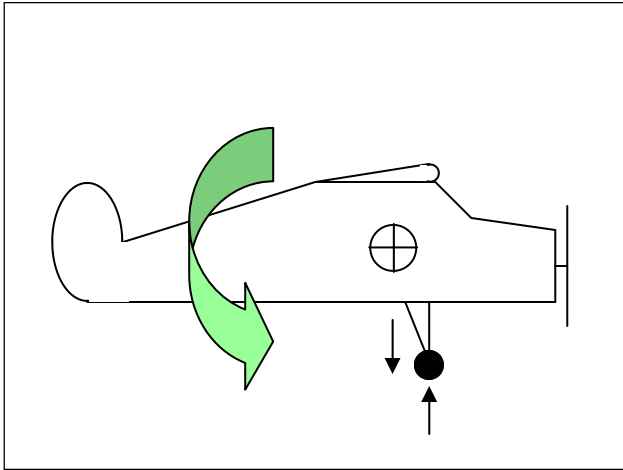
Perhaps it may be best to start right off by comparing the taildragger to the more ubiquitous tricycle gear airplane for which most pilots are more familiar. The main difference between taildraggers and their tricycle brethren can be distilled down to the position of the main landing gear. A taildragger can essentially be perceived as pushing its main gear out ahead of the Center of Gravity (C.G.). Conversely, the tricycle airplane drags its main gear behind the C.G.

First let us discuss the dynamics about the vertical (yaw) axis. Consider the mental image of an airplane during



landing that travels along a centerline directed north (i.e. 360 degrees). By definition, both the centerline of travel and the yaw axis pass through the airplane's C.G. Now visualize that the airplane is not aligned with the centerline of travel in that its nose is pointed 10 degrees to the left (i.e. 350 degrees). Upon touchdown in this situation, the main gear will not be aligned with the direction of travel and will want to roll in a direction 10 degrees left of the centerline. For the taildragger, the main gear will be ahead of the C.G. and to the left of the centerline of travel. The main gear will want to go to the left while momentum carries the airplane's C.G. along the centerline of travel (i.e. due north). This pulls the front half of the airplane to the left and rotates the airplane counter-clockwise and away from the direction of travel. Now the main gear is even more unaligned and the rotational forces are even greater. If left unchecked in the early stages this action will cause loss of directional control and can potentially degenerate into a ground loop. Of course, it is best to land with the airplane properly aligned with the direction of travel in the first place. When a tricycle airplane is placed in the situation above, at touchdown its main gear will be behind the C.G. and to the right of the centerline of travel. As before, the main gear wants to go to the left while momentum carries the airplane's C.G. along the centerline of travel. However, this time around it is the back half of the airplane that is pulled to the left and it is now pulled towards centerline. This action rotates the airplane clockwise and brings it back into alignment with the direction of travel. Directional control is maintained automatically by the design of the tricycle landing gear and in spite of the pilot's inattentiveness to alignment.

This is a good time to switch the discussion to the dynamics associated with the pitch axis. Consider what happens during a landing as an airplane descends towards the runway. As an airplane of either configura-



tion contacts the runway, the main gear's vertical descent is halted, but momentum causes the rest of the airplane to continue its downward motion. This results in the main gear pushing up on the fuselage at its mounting point. For the case of the tricycle airplane, this mounting point is behind the C.G. and at the moment of contact, when the motion at the C.G. is still downward, the fuselage just above the main gear remains relatively fixed. This creates a rotation that lowers the nose of the airplane, which decreases the wing's angle of attack. This in turn decreases the lift produced by the wing and reinforces the downward motion to help hold the airplane on the ground. This is considered a stable condition and makes the pilot look good. On the other hand, what happens to the taildragger is quite the opposite. The main gear on the taildragger is mounted ahead of the C.G. and therefore as the main gear contacts the runway it pushes the nose up as the C.G. continues downward. This action increases the wing's angle of attack resulting in increased lift that tends to oppose the desired motion and can actually send the airplane back into the air. The latter situation is known as a "bounce" and it does little to enhance the pilot's image. It should be noted that the term "bounce" is misleading because it creates the impression that the spring action of the landing gear causes

the airplane to become airborne again when in reality the action is mostly the result of aerodynamics rather than mechanics.

In summary, we have described the two banes of taildraggers, which are the loss of directional control and the "bounce". But, I should point out that there are some things that counter the instabilities of the taildragger's landing gear configuration. The horizontal and vertical tail surfaces certainly offer stabilizing interactions as long as sufficient airspeed exists. That little wheel in the back, for which the taildragger derives its name, can also provide a significant means to maintain directional control as long as it is firmly in contact with the runway.

Three Point Landings vs. Wheel Landings

Not counting functional variations such as short or soft field landings, there are two basic forms of landings used by taildragger pilots. (Note that by this sort of accounting the tricycle airplane has really only one form of landing.) These two forms of landings are the three point and the wheel landings. The three point landing is for most taildraggers the standard form of landing where the airplane contacts the runway with the main gear and the tailwheel simultaneously. The wheel landing differs in that the airplane initially contacts the runway with the main gear only in nearly a level attitude. In this section we will discuss these two forms of landings.

The tricycle airplane is very tolerant of somewhat wide variations in touchdown airspeeds as well as a certain amount of directional misalignment. This gives the tricycle airplane very favorable handling characteristics allowing for a wide range of pilot proficiencies. Too often a successful landing in a tricycle airplane is more due to the design and ruggedness of the landing gear rather than due to the training and technique of the pilot. The taildragger pilot, on the other hand, must pay strict at-

ention to control of airspeed, attitude, flare, and alignment.

For the three point landing, the airplane's airspeed and attitude are critical in that they are relatively fixed to a narrow range. The flare and the airspeed at touchdown must be timed so as to allow the airplane to settle on to the runway at the slowest possible airspeed with the tailwheel and the main gear contacting the runway simultaneously. Nominally the slowest flyable airspeed is achieved with the airplane rotated into the proper three point touchdown attitude. A minor variation is permissible for reaching a bit slower airspeed that allows the tailwheel to touch ever so slightly before the main gear so that tailwheel pushes up on the tail before the main gear settle which produces a small decrease in the wing's angle of attack at touchdown. This action mimics, to a lesser degree, that of the tricycle airplane at touchdown with the same result of helping to keep the airplane in contact with the runway.

When the tailwheel and the main gear contact the runway simultaneously the "bounce" situation is avoided since no further increase in the wing's angle of attack is possible. In fact, when a three point is properly performed, the vertical descent speed is not critical as long as the landing is not dropped in from too high of a position above the runway.

It has been established that the three point landing is sensitive to all but the smallest variations in the airplane's attitude and airspeed, but is relatively tolerant of wider variations in the airplane's vertical descent speed. As it turns out, the wheel landing is pretty much the opposite in that it allows for wider variations in attitude and airspeed, but is intolerant of too much vertical descent speed.

By definition the tail will be still flying when the main

gear contacts the runway and therefore is lacking firm support under the tail. With a high rate of descent comes more downward inertia acting at the C.G. which results in greater tail-down rotational force when the main gear contacts the runway. This rotational force may be more than the lift from the tail plane can counteract if the pilot isn't quick enough to apply adequate forward stick pressure to suppress the ensuing "bounce". In fact, it is considered good form to always apply some slight forward stick pressure at the moment the main gear contacts the runway. This action manually pushes up on the tail and reduces the wing's angle of attack in much the same way as is done automatically by the tricycle landing gear. However, in cases of excessive vertical descent speed there may be little the pilot can do to suppress the "bounce".

Although sensitive to vertical descent speed, the wheel landing is tolerant of fairly wide variations in the airplane's attitude and airspeed. In fact, varying the airplane's attitude is the primary control over the vertical descent speed, albeit the airspeed determines how much change in attitude is required. A faster airspeed means



that the attitude has to vary less for a given amount of control. The upper limit on airspeed determined by how much extra runway length, or airframe abuse, the pilot is willing to accept. The lower limit on airspeed is determined by how low the pilot is willing to let the tail drop to minimize the vertical descent speed. An excessively tail-low attitude with its correspondingly lower airspeed may make it impossible to raise the tail enough to realize any of the benefits offered by the wheel landing. Even worse, an excessively tail-low attitude during a wheel landing may deny the airplane adequate directional control because the tailwheel is not yet firmly in contact with the runway and the airflow over the tail surfaces is too low for effective rudder control.

Conclusion

It may sound as if the taildragger has little relevance to flying tricycle gear airplanes, but good airspeed control and attention to alignment is good technique for tricycle airplanes, also. It is considered every bit as good of form to make a minimum speed touchdown in a tricycle airplane as it is for taildraggers, albeit not mandated by landing gear characteristics. Furthermore, many tricycle gear pilots find it a humbling experience to learn during transition training that the taildragger can make it abundantly clear that they might not have as good of a cross-wind landing technique as they might have thought. Maintaining the same attention to runway alignment in tricycle airplanes as one would for taildraggers is a safer practice and much easier on the airplane. In my next article I will discuss in further detail the wheel landing which can be as much of an enigma to taildragger pilots as it is to tricycle pilots.

Chapter Calendar

Jan 1	HIO Twin Oaks EAA 105 Pancake Breakfast 503-646-8763
Jan 13	EAA 105 Chapter Meeting Bogardus Little GEEBEE Restoration at Dick VanGrunsven's shop—Sunset
Jan 20	EAA 105 Board Meeting John Halle's office—downtown Portland
Feb 5	HIO Twin Oaks EAA 105 Pancake Breakfast 503-646-8763
Feb 10	EAA 105 Chapter Meeting Location TBA
Feb 17	EAA 105 Board Meeting Location TBA

2004 Aviation Calendar

Jan 8-9 '05	Upland, Ca Cable Airport (CCB) 30 th Annual Pomona Valley Air Fair 909-238-4508
Feb 10-12	Ontario, Ca Soaring Society of America National Convention 505-392-1177
Feb 26-27 '05	Puyallup, Wa Northwest Aviation Conference 866-922-7469
Mar 6-9	Baja California, Mexico El Galito Baja Bush Pilots Whales 2005 Trip II; 480-730-3250
Mar 15	Scottsdale, Az (SDL) Business Aircraft & Jet Preview
May 19-21	Hayward, Ca (HWD) Hayward Proficiency Air Race 925-784-7128
Jun 13-15 2005	Paris, France- Paris Airshow 2005

Board Meeting Highlights

Your Chapter 105 Board

The chapter board meeting was held at the Bridgeport Pub in NW Portland on December 16, 2004 at 7:00 PM. Rion Bourgeois, Jim Pace, Jim Mitchell, John Halle, Mike McGee, Randall Henderson, Dick VanGrunsven, Ralph Schildknecht, Joe Blank and Benton Holzwarth attended.

- The November meeting minutes were accepted without change.
- The 2005 Board of Directors: There were no additional suggestions or volunteers so the proposed set of Board Members were approved to their positions. Rion Bourgeois as President; Randy Lervold as Vice President; Benton Holzwarth as Secretary and NL Editor; Jenny Hickman as treasurer; Mike McGee as Quartermaster and associate NL Editor; Randall Henderson as Sgt-at-Arms and Meeting Coordinator; Joe Miller as Breakfast Crew Chief; Jim Pace as Breakfast Crew Chief; Dick VanGrunsven as Bogardus Trust Liaison; Jim Mitchell as Librarian; Woody Hall as facilities Mgr.; and John Halle and Ralph Schildknecht as Members at Large.
- Joe Blank has agreed to cover a new position of Fly-Out Coordinator but declines to serve on the board.
- Green Lathe: Benton was given a lead to Turk Manufacturing, who has a display of restored machine tools in their offices. He hasn't yet, but will contact them about any interest they might have in the Bogardus lathe.
- RV-6 Wing/Tail Kits: We're pursuing nibbles from Greg Halvorson and the Evergreen Aviation Museum folks, on behalf of Lane Community College. (Late Breaking News: Greg Halvorson has agreed to purchase the kits. -- Ed.)
- The chapter has a reservation in on the the T-hangar of the new row going in at Twin Oaks, in lieu of a larger free-standing structure of our own elsewhere on the

Twin Oaks airpark. This T-hangar will be large enough for one plane, with space available to add a 'loft' area.

- Upcoming meetings: Upcoming meetings are still in a state of flux. (Following the board meeting it has straightened out as: Jan: Dick VanGrunsven's shop at North Plains to see the Bogardus Little Gee Bee restoration project; Feb: Dan Benua's RV-10 project plus a visit from the SpaceShipOne program manager; and March our annual visit to the Van's Aircraft factory in Aurora.
- Young Eagles: No news, Harvey didn't attend.
- Chapter Hangar Sign: No news, Woody Hall didn't attend.
- Breakfast: MikeM has the provisioning organized, Jim Pace is chasing down a blender to automate egg-smashing, and Len Kauffman is lined up to make the volunteer reminder calls.
- The holiday banquet came in \$100 under budget. The board approved 'thank you' gifts for Jenny Hickman, Dru Bourgeois and Marcy Lang for the lavish and tasty foods they prepared.
- Northwest RV Fly-In planning: The date for the '05 event will be the usual -- the Saturday before Father's Day. Mike has signed up RandallH as the Marketing crew chief, Joe Blank for Airplane Parking and Ralph S for Ground Radio.
- Fly-Outs: Joe Blank is soliciting ideas for chapter fly-outs. [He can be contacted at jebblank@molalla.net --ed.]
- Oregon International Airshow: Scheduled for Sept 9-11 (this is the weekend before the Reno Air Races; no conflict). The USAF Thunderbirds will headline this year. Discussion of a formation fly-by, requirements for 'formation card's. There is a need for more pilots to become more involved in the safety aspects of the show (vs. the public safety folks there now, who aren't necessarily pilots.) RandallH and John Halle would like to be more involved in the planning and organization of the airshow, and will try to attend their meetings.
- Chapter 105 will apply again to host the EAA's B-17

during its west coast tour. HQ's standard policy is to avoid bringing it to airshows, but OIA-HIO's organization might allow for morning rides and afternoon ground tours. It seems like the B-17 orbiting the area would be good advertising for the airshow, and the airshow folks appreciate acts that don't require 'appearance fees.' The board suggests we try for the OIA-HIO (Hillsboro Airshow), but avoid scheduling it during the NW RV Fly-in and Arlington Fly-In weekends.

Next Meeting at John Halle's office

The next board meeting will be at John Halle's office -- 7:00 PM on January 20, 2005. Directions: The office is Stael Rives LLP; 900 SW 5th Avenue. There are doors on both 4th and 5th but the 4th Avenue side may be locked. During the day you can just walk in, go to the elevators (left side bank if you are coming from the 5th side, right side if you came up the escalator from 4th. Go to 26. I will be there. At some point you may have to check in with the guard. If so, say you are going to an EAA Board meeting at Stael Rives. I will let the guard know. If anything gets screwed up, call my cell phone (503)939 5527.

You can park across 4th and go thru the tunnel to the office building (garage elevator to "C") or park in the Pioneer Place lot one block north on 4th. Either will cost money though and you should be able to park on street by that time. An area map is available at <http://www.tinyurl.com/6xtp5>

2004 Feature Article Index

My plan for this section is to both chronicle our contributors for the previous 12 months (thank you authors and photographers!) and in the January issue provide a complete index to the previous year's articles. —Ed.

January '04

- Randy Lervold / The Homewing Membership has Spoken
- Mike McGee / Nov Meeting: Sheepspen—Steve Householder's RV-6 (& T-28s)
- Carl Battjes / December Meeting in Beaverton — Carl Battjes' Chard-6
- Kevin Lane / Adventures from the Logbook — The Trap Had Been Well Set

February '04

- Carl Battjes / Report from the Design Group
- Mike McGee / Jan Meeting: Aurora Airport — Kent Byerley's RV-9A
- Mike McGee / Experimenting — Pre-flight-able Brake Reservoirs
- Ed Anderson / Ducts Vs Diffusers — Cooling

March '04

- Randy Lervold / New Web Site Up!
- Benton Holzwarth / Birds of a Feather — Special Interest Groups
- Mike McGee / Feb Meeting: Randy DeBauw's RV-10

April '04

- Dick VanGrunsvan / Little Gee Bee Restoration
- Mike McGee / March Meeting: Van's Aircraft at the Aurora Airport

May '04

- Carl Dugger / Chkalov Update
- Mike Robertson / OK, NOW What Did I Do?
- Randy Lervold / A Perspective on Testing
- Mike McGee / April Meeting: Ralph Hudson's Strojnik S2 Motorglider

- Bob Duncan / Balanced Lobbying at the Port of Portland
- Amit Dagan / A Methodology for Planning Your Wiring Process

- Randy Lervold / Window of Vulnerability
- Denny Jackson / Denny Jackson Takes Flight

June '04

- Joe Blank / N6810B's First Flight
- Don Hammer / What I Did on My Summer Vacation: Three Days on Lake Washington
- Jenny Hickman / It's Poker Run Time Again!!!
- Carl Dugger / Excitement Builds for the Russian Visit to Chkalov Days Celebration
- Mike McGee / Getting ready for the 13th Annual Northwest RV Flyin
- Amit Dagan / Do You want To Do It On The Table, Or Would A Mattress Be More Comfortable for You?

- Mike McGee / May Meeting: the Hillsboro Airport — Mike McGee's Alternative Engine Showcase
- Nat'l HQ / Pilot and Actor Harrison Ford Accepts Chairmanship of EAA's Young Eagles program
- Benton Holzwarth / AOPA Fighting for Crosswind Runway at Mahlon Sweet Field, Eugene

- Jess Frost / Benefit Dinner for Chkalov Cultural Exchange Committee
- Bob Duncan / Port of Portland -- Community Meeting on HIO Airport Noise and Helicopter Issues

July '04

- Jerry VanGrunsvan + Jerry & Judy VanGrunsvan, Paul & Joan Good / Alaska!
- Amit Dagan / NW RV Flyin—"On a Day Like This You Should be Flying."
- Benton Holzwarth / NW RV Flyin—A First-Timer's Visit to the VAF Homewing Fly-In
- Amit Dagan / A Custom Ground Block
- Benton Holzwarth / June Meeting: Dietz Airpark — Ken Scott and Ken Krueger's Scratch Built Pipsqueak

Project

August '04

- Mike McGee / The Third Annual Chapter 105 Poker Run
- Jerry VanGrunsvan + Jerry & Judy VanGrunsvan, Paul & Joan Good / Alaska! Pt. 2

September '04

- Ann Marie Smith / IAC-67 Event Notice!! Earn Your IAC Smooth Patches!
- Marcy Lange / Thank You, Thank You, Thank You
- Randall Henderson / Hillsboro Airshow EAA Flyby
- Randy Lervold + Cassie Lervold / Formation Flying
- Amit Dagan + Gail Dagan / First Flight -- The Toolmeister's RV-7
- Mike McGee + Dunstan Fandel / Aug Meeting: Aurora Airport -- Kent Byerley's RV-9A

October '04

- Carl Battjes / The Joy of Slow and Simple
- Randy Lervold / Formation Flying Materials Now Available
- Benton Holzwarth / Progress Report: Randy Griffin's RV-8

November '04

- Randy Lervold / New Prop Balancer Program!
- Amit Dagan / WHEN'ZITGONNABEDONE?
- Mike McGee / Oct Meeting: Hillsboro Airport — Condition Inspection with Randall Henderson, Dan Benua and Randy Lervold

December '04

- Randy Lervold / Are You Off Balance?
- Amit Dagan / Phase 2, First Flight or The Next Question After the Whenzitgonnabedone
- Brian Moentenich / A Review of RV Accidents in the Last Year
- Benton Holzwarth / Nov Meeting: Twin Oaks Airpark -- Mike Robertson on LSA & LSP Rules and our Annual Pie Auction

Buy / Sell / Trade

Ads are free but are subject to editing. Aviation related ads are given priority. We reserve the right to refuse any ad. Submit to the Editor, Benton Holzwarth (benton@siletzbay.com) or call 503-684-2008. Please let us know when your item sells. Ads will run for four issues, and may be renewed or adjusted by contacting the editor. Last issue indicated by [mm/yy].

Classifieds

Continental A-65 engine — completely disassembled for your inspection. Price is \$5000 firm. All parts have been inspected & yellow-tagged by Premier Aircraft Engines of Troutdale, Oregon. Cylinders are .015" oversized. They have all new intake and exhaust guides, all new keepers, and all new Stellite (100 octane) exhaust valves (part number 21479). Crankshaft is standard. Cam is new. Case and accessory cover checked for cracks. Everything else has been inspected and found airworthy. Does not include any accessories. Pistons and rods to convert to 75hp are available. Mark Pearson neat1s@yahoo.com or 503 740-3853 [04/05]

RV-4 Empennage — 90% complete. Avery's RV builder's tool set (the big one) with extras including pneumatic squeezer and extra yokes. Clarence Potts 503-670-9060 [04/05]

RV-3 for Sale — 0-290 power, about 900 hours engine and airframe, free of electrical system, lights, and avionics, finished about 1982, flew through summer of 2002. \$13,000. call Irv Kurz, 503-621-9649 [03/05]

3HP Air Compressor for Sale — 20 Gallon tank with wheels. Oil lubricated, belt drive. 15A @ 115V. RV construction veteran. \$125. Call Dan Benua 503-702-5387 [03/05]

Hangar Mate Needed — to share large HIO space with two RVs for \$150/mo. Ideally this would be a Piper high-wing (Tri-Pacer/Colt) or a vintage C-182. Alternatively, if you would like to store your boat/glider/precious car in a locked hangar in a fenced airport, please contact Bob

(503-771-6361) or Amit (503-292-9780) [02/05]

RV Parts — Stainless steel outboard landing gear fairing brackets (U-808). Available in 18 gauge and 14 gauge. Will not break like aluminum brackets. \$20 for set of two. New complete 60 amp alternator kit. All mounting brackets have been primed and painted. Includes brace between alternator and starter. \$220 (\$30 off Van's price). RV-6/8 Pre-punched Empennage video set from George and Becki Orndorff. \$20. Len Kauffman 503-885-1920 or lakauf@comcast.net [02/05]

Pacesetter Propeller Works, LTD for Sale — Includes Carving Machine (tracer lathe), Hub Tracker, Inventory of Hub extensions (4, 6 & 8 Lycoming), All patterns (Cassidy designed), glue beams & clamps, finish work table. Please contact Keith at 503-628-0547 [01/05]

Open for Business

Top Flight Interiors — Fine Aircraft upholstery, impeccable quality, custom interiors, leather specialist, imported textiles. Jesse Cary at Twin Oaks or 503-475-1036.

Web Sites, Applications & Desktop Publishing — Oregon Media, Phil Spingola phillip@OregonMedia.com or 503-201-4896

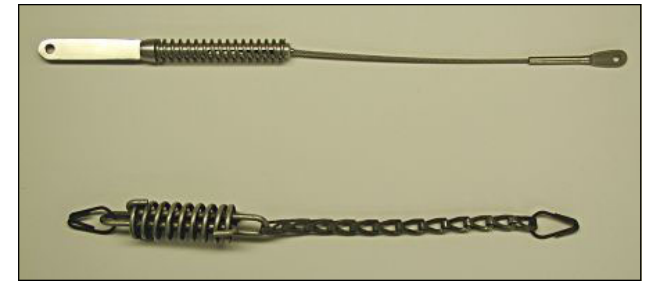
Duckworks Landing Lights — Standard kits start at \$75. Round Halogen and Xenon HID lights are available for new installations and upgrades of our kits and others. For details/pricing see www.duckworksaviation.com or call 503-543-2298

Bill Esther Engraving — Contact Bill for help with your custom engraving project. See sample work at http://www.rvproject.com/esther_engraving.html ecaps.1@juno.com or 503-851-6375

AEROFRAME Gallery — Aviation Merchandise and Custom Picture Framing — Located at the intersection of I-205 and 99E (McLoughlin Blvd.) in the Oregon City Shopping Center, AEROFRAME Gallery offers a huge selection of collectible airplane models, aviation art, and aviation related items for all ages. Non aviation art is also available. Visit the gallery and/or the website to view the gallery, its items, and the custom frame selections. 503-557-1333 www.aeroframegallery.com



Brentz Enterprises — Tail Lynx — Tail steering springs made from aircraft-grade materials. Small, strong, streamlined and all Stainless steel. Now available through Van's Aircraft — www.vansaircraft.com or 503-678-6545



Editor's Notes

Benton Holzwarth v2

It's a crystal clear blue day out as I sit here putting the finishing touches on this issue of our newsletter. Wish I was flying, or at least building.

Hope Santa was good to you, and I wish for good luck to follow you in all of your activities this year.



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**Portland/Twin Oaks EAA Chapter 105
Membership Registration / Renewal Form**



Dues: \$20/yr e-delivery of newsletter, \$25/yr for mailed paper newsletter
Send to: Jennifer Hickman
24172 S. Skylane Dr.
Canby, OR 97013
For Renewals, indicate **changed** information only
Check: New _____ Renewal _____
E-delivery (\$20) _____ Paper delivery (\$25) _____

Name: _____ National EAA #: _____
Address: _____ Own / Fly: _____

Project (Let us know what you're working on): _____
City/St/Zip: _____
Home Ph: _____ Completed: Yes / No / 90% done 'n 90% to go: _____
Work Ph: _____ Pilot Ratings: _____
e-addr: _____ Additional (help for other builders?): _____
Spouse's Name: _____



Next Meeting VAF-Home Wing / Chapter 105

- The Bogardus Little GEE BEE Restoration Project
- January 13, 2005 — 7:00 PM
- Dick VanGrunsven's Shop, North Plains, OR
- Map / Info on page 7

Chapter 105 Board of Directors Meeting

The next Board of Directors meeting will be held at John Halle's office, at 900 SW 5th Ave, Portland. Further directions (you'll need 'em!) at the tail end of last month's BOD Meeting report, on page 12.

HOME WING  **EAA Chapter 105**
Portland, OR — Twin Oaks Airpark 7S3

The Leader In Recreational Aviation
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