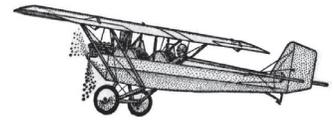




# Brodhead PIETENPOL Association *Newsletter*



Issue 14-03

Third Quarter, Two Thousand Fourteen



Photograph courtesy Douwe Blumberg

## Douwe Blumberg and Dan Helsper “Stand Down”

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## Brodhead 2014 Recap

By Rob Busch (Buffalo, NY)



Brodhead 2014: Ask anyone who has been to Brodhead many times over the years and they will tell you that every Brodhead is different. Sometimes the weather works, sometimes not. It may be a year with many Piets making the trek or just a few able to fly in. There may be lots

of flying, or a full seminar schedule, or later nights at the bonfire, or a great hangar walk. But there are always memories made, because regardless of the details – it is ALWAYS Brodhead. And if you missed it, you missed another wonderful year of making memories.

Campers began arriving as early as Monday this year. The early part of the week is very tranquil as host chapter EAA 431 completes all the final preparations for the event. The weather for the week was really pretty nice with most days yielding warm temperatures and cool nights for sleeping. The Piet arrivals began on Wednesday evening. It was exciting to watch as we went from no Piets parked in the ‘horseshoe’ to five of them being tied down in a matter of minutes. By the end of the weekend, 16 Piets had made the trip home to Brodhead.

On Thursday evening the BPA sponsored a welcome dinner. Kevin Purtee and Shelley Tumino arrived on Thursday – their first trip back since FBG picked a fight with a cornfield. Axel is confident that FBG will be rebuilt and ready for a return to Brodhead in 2016. He and Shelley plan to do a ‘thank you’ dinner for everyone who was involved in Operation Axel. So this year they wanted to do a ‘warm up’ dinner to give them an idea of the logistics involved. Shelley spent the afternoon preparing

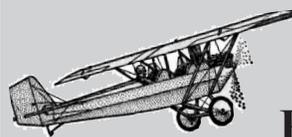
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## 40th Annual Brodhead Pietenpol Reunion

**We look forward to seeing you this year!  
Note the Early Date!**

July 16 - July 19, 2015.

the sauce and at mealtime her, Axel, Ryan Mueller and the rest of the kitchen crew provided a small salad bar, pasta with sauce, sausage, meatballs, and garlic bread. EAA 431 also provided a huge roaster of pulled pork and the iconic Wisconsin cheese curds. All together they fed a lot of hungry people. They also avoided burning the entire place to the ground – but just barely. The total proceeds added up to over \$400 and it was all donated to Chapter 431.

Friday was a bit cool but the very generous Textors once again provided a Brat roast on the South end of the field. For the rest of the weekend the food kept coming. Many attended the Friday Fish Boil and the Saturday Pork Chop Dinner; both put on by EAA 431. They also do a great job with breakfast and the lunch window. Saturday was the banner day with lots of sun and lots of flying. All during the fly-in, BPA Czar John Hofmann welcomed new and renewing BPA members at the registration table. The silent auction was present this year, albeit on a smaller scale. One of the coolest donations came from Santiago Morete. He was visiting Brodhead from his home country and donated a homemade Johnson Airspeed Indicator. Total proceeds from the auction were over \$300 – again this was donated to our hosts per John’s instructions. He made it clear that he wanted provide as much support as possible to the host chapter and they were very grateful. We will attempt to expand an aviation-related silent auction next year. As an aside, it was a banner year for the Hatz guys at the other end of the field. Two of the aircraft went on to win a Lindy at Oshkosh. It is encouraging to see the level of craftsmanship that builders are putting in to the creation of classic homebuilts. And we expect some fantastic new Piets to emerge by next year.

This year we had no official forum schedule as this is bit of a transitional year for the BPA. To be honest, it

was a bit of a ‘perfect storm’ this year as some of our regular forum presenters were unavailable. But we have already touched base with Grace Wynne about bringing a Corvair Forum to Brodhead in 2015. For the Ford guys, Ken Perkins said that he is willing to present next year as well. We are also trying to bring some new topics into the schedule – so stay tuned. Please be aware that Brodhead will be ‘early’ next year. The folks at the other fly-in up the road will be meeting July 20-26. The current plan is to continue the tradition of having Brodhead the weekend before. So mark your calendars.

As hard as we tried to slow down the clock, Sunday morning did arrive right on time. At Brodhead, the arrival is a trickle, but the departure is a flood. The field empties quickly – but the memories linger. For some it is a first ride in a Piet. For many of us, it is the chance to embrace friends we only see once a year. Space does not allow the telling of all the stories. But many of them will be retold next year in one form or another. So start planning, and keep building, and join us for Brodhead 2015. The Field of Dreams awaits us all.

## Brodhead 2015, July 16-19, 2015

By John Hofmann (Columbus, WI)



Brodhead 2015 is early this year. Please make a note of it. For those who do not know, the date of the Brodhead reunion is the weekend before EAA AirVenture begins. Traditionally the “big show” runs the last week in July and often touches the first couple of days of August. In 2015,

AirVenture is a week early and the decision was made to keep the Brodhead Reunion the same weekend before AirVenture. Thus we are July 16-19 instead of a week later.

## Something Special for the 40th

Since this is the 40th Brodhead Reunion, I have been thinking of something a little different that could be a lot of fun. This would be the “Brodhead Cup” air race for Pietenpol Air Campers.

What I propose would be a simple timed flight from



Brodhead to someplace like Monroe and back. There will be four divisions:

- The Model A Division
- The Continental 65 Division
- The Corvair Division
- The Open Division

Each Pietenpol from the Model A, Continental 65 and Corvair divisions would then also be included in the Open Division for ultimate bragging rights. This Division will also accommodate the GN-1s amongst the crowd as well as different engine combinations, such as O-200s, Lambert Radials and Funk Model B engines. Let me know what you think. It sounds like cheap fun to me.

## “Aircamping” 101

By Douwe Blumberg (DeMossville, KY)



Ever since I was a kid, I’d dreamt of building an airplane. Well, at the ripe old age of 47, that goal was finally accomplished. As long as I’ve wanted to build my own airplane, I’ve also daydreamed of camping “under the wing” like the barnstormers did, and like

in those wonderful old pictures of Bernard and friends camping with their Pietenpols (probably completely posed, but inspirational nonetheless).

Now personally, there seem to be some unwritten rules about what constitutes proper Pietenpol “aircamping” etiquette. First off, it can’t be overly comfortable or modern. Secondly it has to be simple and the less “gadgetry” the better. It has to be in a meadow or by a grass strip and it would be really nice if I couldn’t see any



houses and if nobody really knew I was there. For some reason, I'm also motivated to see how minimalist I can be and still enjoy myself.

In late April, an opportunity arose which promised the perfect chance to go "aircamping". I had to meet a client in Louisville (about 50 miles away) and the weather was looking good. I thought, "If I could just find a little grass field in the area, my buddy could pick me up and drop me back off, and I could finally try some real aircamping."

I began calling all the private grass strips about Shelbyville, KY and kept getting "Gee, we don't have liability for that" or "we only let people fly in who are familiar with this strip" (mind you, the "strip" is 4,000 feet long with open approaches, and I bit my tongue wanting to ask how those people "familiar with the strip" became familiar with it) anyway, I digress...

Finally a nice lady at Miles Field outside of Shelbyville, Kentucky responded with "SURE!" and when I asked if she minded me camping the night she said "SURE!" The weather seemed to be holding so I was in business.

My meeting was scheduled for 3:30 Thursday afternoon. Early that morning I loaded up the necessary components for "proper aircamping." I somehow felt that a tent under the wing wasn't as old school as a sleeping bag under the

wing (plus it was going to be a nice night), so it was a bag and a tarp to keep off the ticks and dew. An old-timey primus backpacking stove, a jug of water, some tea bags, a stuff sack with sleeping clothes, a good book, tie downs, a few other knickknacks and we're packed.

I want to get there about 1:00 and there's a headwind (of course there's a headwind, there's always a headwind! on any day, in any direction I want to go, EXCEPT landing!) so I plan to leave at 12:00. Wouldn't you know it... my usually desolate Podunk airport becomes "O'Hare International" the minute I want to fuel up and I end up waiting behind some spam cans for thirty minutes while they pump in what seems half the Saudi's 2014 oil production. We finally get wheels up at 12:30.

It's a bit cool and pretty bumpy on the way down and with a blistering ground speed of 47 to 54kts, it DOES take an hour, but I find the strip with no problems, even though it ain't on the charts. We scope it out a few times and come on down. God is good, because the 14kt wind is coming right down the beautiful 3,000' strip. With the downhill sloping runways and the long grass, the landing is so soft I have a hard time feeling when we actually are down. I keep right on fast-taxiing to the farthest end away from the house, around a dog-leg and swing around in front of the tree line and shut off the mags. The silence is deafening. I take off my helmet and goggles, lift the flop

and look around perched on the cockpit rim. Nothing but green grass, trees and a little pond down the hill. THIS IS PERFECT!

My friend shows up to give me a ride and since the wind has died down (within minutes of me landing) I give him a quick “round the patch.” He loves old things too and actually tears up; it’s so nostalgic. The owner of the field walks over to say “hi” and we chat for awhile. She’s pretty lonely having just lost her husband of 56 years. She’s a really sweet lady, but can’t keep up with the field so it’s on the market. We finally secure the site and tie RE-PIET down with my nifty “Uncle Abe’s” tie downs (check them out if you’re in the market, it’s a really good design”) and head off to my meeting and dinner.

Dinner takes longer than planned and they don’t get me back to the field until after sunset. I bid them goodbye, anxious to be by myself. By the light of a headlamp, I set up “camp” (under the wing of course). The tarp is laid down and folded over my sleeping pad and bag like a sandwich and staked around the edges. My head is next to a big wheel and I have some clamps so if I want, I can lay that end of the tarp over the wheel and clamp it together forming kind of a tent around my torso. I brew up some

tea and watch the moon come out over a perfectly still night. As the evening sounds begin, I snuggle into the bag and doze off under the wing outlined against a starry sky. Next time, I need a better pad as I’m either bonier than I used to be or the ground is getting harder, but other than that, I’m really comfy. The gray dawn wakes me to a deer grazing not ten feet away me. She snorts and splits the minute I move though, spoiling the photo-op. I lay there for a while, not wanting to leave the warmth of my bag, soaking in the experience as I sleepily study the giant “PIET” of “RE-PIET” painted on the wing above me. I watch dew dripping off the trailing edge and pinch myself to make sure I’m not dreaming. After all these years and decades, I am actually aircamping under the wing of an airplane that I built myself, in a nondescript grassy field in the Midwest.

It’s a grayish morning and the sun is nothing more than a rose-colored patch in the sky. Gradually the birds begin their songs as the clouds burn off and the sun begins to shine through the parchment-colored translucent wings. Another cup of tea is brewed while I warm up and work out the kinks. I do a little morning reading before I pull up stakes and pack everything back into the little cubbies from whence it all came.

After another visit with the owner, I do my preflight, crank her up (sure do like that electric start) and taxi into position. There’s zero wind, so taxiing into position entails pulling forward fifty feet and turning left. Full power, tail up, stick back, a wave to Helen and her dog as I find my course and head home. This time it’s perfectly still air and RE-PIET feels like she’s on glass rails in the sky (greased glass rails at that!). The steam clouds from the power plants dotting the horizon are all straight up. There’s not much to do on such a smooth day except watch the scenery pass by and listen for any tiny inconsistency in the engine sounds. RE-PIET is perfectly trimmed right now (yes she has a servo operated elevator trim tab), and I notice something funny as I lean forward to get closer to the windscreen; the GPS shows me descending. I lean back and it shows me climbing. WOW, now that’s cool! I can also induce a turn by holding an arm in the slipstream. I decide this is the perfect opportunity to ck my airspeeds. Turns out that 2,200rpm = 70kts, 2,300 = 73kts and max rpm 2,500(ish) = 80kts.

Forty five minutes later, the wheels touch down on the asphalt runway at my home base and I’m safely home.



## Chapter 10. “Why Build?”

Excerpted from *Not Gonna Build Itself*, a forthcoming book by Ken Bickers, Longmont, CO.



Sometimes it feels like the first week of my freshman year of college when someone not from the homebuilding community first sees me working on my Pietenpol. In those first days of college, the questions asked in an endless loop were “Where’s home?

What’s your major? Which dorm?” Among non-builders, the predictable questions are “How many hours do you have in it? Is it a kit? When will you finish it?”

Mostly I have stock answers for these questions. I don’t keep track of the hours I’ve spent on my Pietenpol project. Some people do. I don’t. To my mind, that is like asking how many hours you spend fishing, reading books, or loving your wife? Counting hours is what employers expect. Building a Pietenpol is not like that, at least not for me.

The kit explanation is my favorite. I show the plans. I explain that the Pietenpol is not a kit and never has been one. Still, I often get the follow up question, “So did you make this part, too” (finger pointing somewhere at airframe)? No doubt the last is a test to see what “not a kit” means in practice.

I’ve developed a simple answer to the question of when I’ll be done building. I say “Tuesday.” For some, this satisfies. Others look doubtful and wonder how in the world I can get everything done that needs doing by the upcoming Tuesday. They think maybe I’m pulling their leg. I’m not. I clarify through repetition: “Tuesday, I didn’t say which Tuesday.” I figure I have a one-in-seven chance of being right.

Among visitors to the hangar, the question rarely asked directly, but frequently lurking not far from the surface, is “Why are you building an airplane?” There was one visitor to my hangar a few years ago, who posed the question explicitly. He wanted to know how much time I had invested in my project (I didn’t know) and the typical investment of hours (I didn’t know that either but assumed it to be in the thousands of hours), how much the materials cost (I’ve never totaled that number but indicated the total would probably end up somewhere in the range of 10 to 15 or perhaps 20

thousand, which seems about right but may not be), and why the “going rate” for a completed Pietenpol was barely more than the price of the raw materials. Surely there was something wrong with the design or the resulting airplanes if all that labor time was accorded such a low value. Why would anyone build a Pietenpol if they couldn’t sell it later to recoup their labor and materials costs? It didn’t compute. It was wholly irrational.

He was quite intense about this, unpleasantly so. Still I tried a couple of tacks. I briefly tried to explain why the economics profession had abandoned the labor theory of value toward the end of the 19th century. He seemed indifferent toward the basic principles of Microeconomics 101. The flaws of the labor theory of value were lost on this fellow.

So I tried a different approach. I asked him if he had children. Two, he replied. I asked him how much they were worth. This induced a moment of verbal constipation. It didn’t last. He stammered that his wife liked children. But I persisted, asking if his kids had turned out to be good investments? Perhaps he expected they would return a profit down the road? What economic value would he assign to them? All of this seemed to confuse him. In fairness, not since America abandoned labor-intensive agriculture has it made sense for couples to have children based on their potential contribution to household productivity. I was serious, however. What is the point of having children in modern America? The answer – or perhaps more accurately, my answer – is that we want children, not because they make financial sense; they don’t. We want children because they are an expression of things we care about. Apparently, in his case, what his wife cared about.

The analogy from having children to building an airplane isn’t perfect, but isn’t too far afield, either. The reasons for building reflect who we are. In my case, I cannot remember a time when I wasn’t building something, usually some mode of transportation. I was four when I “helped” my grandfather build a pedal-powered jeep from bike parts and wood. It was the coolest jeep ever built, capable of handling every type of terrain, as long as the terrain was paved and reasonably flat.

A few years later, when I decided that I would grow up to become an arctic explorer, I set up my first steaming system to bend limbs from one of our trees into the shape of snowshoes. These were laced with leather straps cut from one of my dad’s jackets and made ready for the first good snow. While I waited for the

snow to begin falling, I began training for cold weather exploration by sleeping with my bedroom windows wide-open. Apparently I was meteorologically and geographically challenged. Growing up in central Texas, winter nights rarely drop much below the 50s, temperatures many people consider perfect for good sleeping. It was two or three years before we got that snowstorm I'd been awaiting. Snow covered everything to a depth of at least half an inch. That's not quite enough. I never did find out if those snowshoes would carry me across the vast snow crested vistas surely lying between me and the North Pole.

My first aircraft project was a helicopter. I was maybe eight when I finally raised sufficient funds to send away for the Personal One-Man Helicopter plans advertised in the back of Popular Mechanics. Even at that advanced age, I recognized that the drawings were a bit rudimentary. I was undeterred. Over a three year period, I spent lots of afternoons making piles of saw dust. Best were the occasional evenings with my dad who would weld components for me at the business where he moonlighted as a bookkeeper to help make ends meet for our family. The helicopter never flew. Perhaps someday I'll return to that goal.

Other projects came and went through the years. The act of transforming raw materials – slowly, painstakingly, precisely – into components that overtime will be assembled into complete artifacts in which each individual component derives its purpose is the essential act that makes us human. Tool use is not uncommon among mammals. What separates humankind from animal kind is our ability to learn new ways to use and make tools to transform raw materials into wholly new products.

The great irony is that those of us building Pietenpol Aircampers are engaged in a process of crafting an airplane whose design is over eighty years old. Surely that doesn't count as making something that is wholly new. But building an airplane from the 1920s returns us to a time when people knew the novelty of flight. They remembered a day before aviation. They did not – could not – conjure images of airplanes as giant metal tubes whose only purpose is transporting hundreds of people from city to city. For all of human history, save the past hundred years, people have been able only to envy birds. A simple plane with open cockpit, held aloft by fabric and wires, celebrates flight as it had previously been experienced by birds alone.

The process of building an airplane roots us in the expression of fundamental humanness. We build because that is what we do. We use tools; we fabricate

new tools; we make pieces; we combine them into assemblies; we stitch those together to comprise something wholly new. Who counts the hours that we devote to expressing who we are? How can a dollar amount be assigned to something so fundamentally expressive? We build because that is what we do.

## Vi Kapler - Gone West

Vitalis Jerome Kapler took off on his final flight on Thursday, Dec. 11, 2014.

He was born May 14, 1927, in Cresco, Iowa, to Albert and Mary (Drilling) Kapler. He attended Cresco High School class of 1945. He farmed in Cresco until attending A&P Aviation Mechanics School in Winona. In 1969, he married Dorothy Irwin and lived in Minnesota City. The couple moved to Cherry Grove, and ran Kaps Airplane Shop and worked with Bernard Pietenpol until 1980. They then moved to Rochester, and ran Kap's Grocery and Kitchenettes until 1990.

Vitalis was a member of EAA chapters, including Rochester, Winona and Austin, and belonged to many antique and classic aircraft clubs. Member of the Quiet Birdmen. He built 27 experimental aircraft and taught yearly technical "How to Build Experimental Aircraft" forums in Broadhead and Oshkosh, Wis.

He is survived by two daughters, Jennifer Kapler of Brooklyn Center and Rebecca Kapler of Rochester; a brother, Joseph Kapler of Dubuque, Iowa; nieces and nephews, David Kapler, Mark Kapler, Mary Blythe, Joseph Kapler II, Diane Erickson, Doug Bromer, Julie Urban, Margaret Urban and Michael Urban. He is also survived by his second wife, Darlene Smith of Rochester.

He was preceded in death by his wife of 28 years Dorothy Kapler, who died in 1997, and siblings, Clara Gillis, Victor Kapler and Rita Kapler.

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Thanks

**Don Emch in the Allen Rudolf Pietenpol, leads Andrew King in “RE-PIET”**





## Sensenich Wood Propeller Co., Inc Service Bulletin WSB-1, July 13, 1999

*Editors Note: I have had several questions about wood propeller installation and torque. I decided enough time has passed by that this Service Bulletin should be re-printed and that most had not seen it. While it was written specifically for Sensenich propellers it has a lot of good advice.*

Several instances of loose propellers in the last year have prompted a review of wooden propeller installation and operating procedures, in particular the proper technique for applying and maintaining propeller bolt torque. All loose propellers have shown signs of burning on the hub mounting face, sometimes accompanied by bolt hole and/or counter bore elongation, indicating relative motion between the propeller hub faces and contacting flanges.

Maintaining proper bolt torque is the most important maintenance item for a wooden propeller. Loss of proper bolt torque will result in the decrease or loss of hub compression and thus the loss of drive friction between the propeller mounting hub face and the engine or spool drive flange. At this point the drive torque is transferred only by the propeller bolts and/or flange drive bushings, which will then begin to elongate the bolt holes and/or counterbores in the mounting face of the wooden propeller and can cause cracking in the hub. The propeller bolt torque must be carefully applied and checked periodically in order to maintain adequate hub compression. Do not torque above the recommended levels as this will crush the wooden hub, breaking its moisture seal and slightly reducing the drive-torque capacity of the installation.

### Propeller Bolt Torque Maintenance

The main factor that leads to the loss of propeller bolt torque is the variation of wood hub thickness with long term environmental changes. Propeller bolt torque should be checked according to the following schedule:

1. Stabilization Period - When installing a propeller, check the propeller bolt torque after first flight, then recheck every 10 hours or 10 days, whichever comes first, until the torque stabilizes. The torque should be completely removed and then retorqued to the recommended values using the pertinent installation instructions.

2. After Stabilization Field - Once the propeller bolt torque has stabilized, the torque check should be performed every 50 hours or annually.

3. Environment Changes - Should the operating environment change significantly in temperature and/or humidity for a long period of time, the propeller should undergo another stabilization period.

NOTE: Refer to the Sensenich Wood Propeller website, <http://www.sensenich.com>, for pertinent installation instructions and bolt torque numbers.

### Additional Installation Tips

**Spinner or Spacer Installations:** For propeller installations that use spinner bulkheads or spacers mounted in between the propeller and mounting flange, ensure that both faces of the bulkheads/spacers are smooth and clean. Testing has found that painted surfaces provide the greatest drive friction and larger safety margin if hub compression is not maintained.

**Installation Hardware:** Ensure that all threads on propeller attaching bolts, lock nuts or drive bushings (where applicable) are clean and dry. Any lubricants on threads can result in over-tightening and possible crushing of the wood hub.

### Wood Propellers: Installation, Operation and Maintenance - Integral Flange Crankshafts

Your Sensenich wood propeller was manufactured from aircraft selected lumber. The laminations are bonded with high-strength waterproof resorcinal glue, and were assembled under closely controlled factory conditions. Propeller balance was strictly maintained during manufacture and verified before shipment from the factory. Assembly of Type Certificated propeller/engine/aircraft must be accomplished by personnel holding the appropriate FAA license.

Installation of the propeller will require a front face plate of adequate stiffness (approximately the same size as the propeller hub), a flange adapter (in some cases), and a set of attaching bolts of the proper length.

It can be shown that an engine must deliver its driving torque to a wood propeller through static friction. That is, the force which resists movement of the propeller hub on the engine flange is due to compression of the wood surface against the flange. Therefore it is important to compress the wood to its maximum during propeller installation, but also important to avoid crushing the wood. Although the drive bushings incorporated in most flanges provide a backup system, a load will be imposed on them only if there is movement of the propeller on the flange. The bushings can carry engine driving-torque loads for only a short period of time.

*Forest Products Laboratory data for Yellow Birch<sup>(1)</sup>* wood shows that the optimum compression pre-load of a wood propeller hub is approximately 0.006 inch per inch of hub thickness (i.e. a propeller hub is approximately 0.006 inch to a thickness of 0.994 inch by drawing up the propeller attaching bolts). Knowing the hub thickness and the number of threads in each inch of attaching bolt thread, it is possible to calculate the proper additional rotation of each attaching bolt after the front face plate, propeller, and flange (or adapter) are snug.

*(1) Forest Products Laboratory, US Dept of Agriculture, Madison, Wisconsin, USA*

For example, a propeller hub which is 4.50 inches thick should be compressed  $0.006 \times 4.5$  equals 0.027 inches. If 1/2 inch diameter bolts are used (1/2-20UNF threads), they should be turned  $0.027 \times 20 = 0.51$ , or just over 1/2 revolution after the front face plate, propeller, and flange are snugged. See Table No. 1 for examples of common installations.

Generally recommended wrench torque to achieve proper hub compression against standard flanges are in Table No. 2. These torque recommendations do not consider variations of thread condition, and assume that the threads of the bolts and in the drive bushings are clean.

## Installation Procedure

After study of the preceding discussion of wood propeller installation requirements and of your propeller assembly, the following installation procedure should be followed:

1. Be certain the magneto switch is “off” and that both magnetos are grounded.

2. Install the flange adapter, if required. Adapter retention bolt wrench torque recommendations can be found in Table No. 3. Lock and safety wire the bolts.

NOTE: Some adapters require safety wire through the bolt heads, others incorporate safety-wired set-screws.

3. Locate the propeller on the engine flange, or adapter, in the most convenient position for hand cranking.

4. Remove a spark plug from each cylinder. Chock the aircraft's wheels to prevent movement.

5. Install the propeller attaching bolts “finger tight” so that the face plate, propeller, and flange are snug (but the wood has not been compressed). Check track of the blade tips by rotating the tips past some fixed object on the floor. The tips must track within 1/16” of each other when the installation is completed. Track should be corrected at this time by snugging up the bolts nearest the blade which is forward. This will result in a common starting point for all of the attaching bolts.

6. Tighten the attaching bolts in small increments, moving diagonally across the bolt circle. It is good practice to check track frequently while tightening the bolts. Take care to tighten bolts on opposite sides of the blade centerline evenly so that blade-to-blade conformity of angles is maintained.

7. Since a small pad of wood compression is plastic (permanent), it is good practice to loosen the bolts and allow the wood to relax for an hour. Retighten following the same procedure.

8. Install safety wire. It is good practice to wire the attaching bolts in pairs (not a continuous wire), twisting the wire between bolt heads.

## Operating Tips:

The following practices will add to the service life of your wood propeller.

1. Do not use the propeller as a tow-bar to move your aircraft.

2. Avoid running-up in areas containing loose stones and gravel.

3. Place the propeller in a horizontal position when parked.

4. Inspect frequently for bruises, scars, or other damage to wood and blade leading edges protection.

5. Protect your propeller from moisture by waxing with an automotive type paste wax. Keep the drain holes in metal tipping clean.

6. Assume that your propeller is un-airworthy after any kind of impact until it has been inspected by qualified personnel.

7. Inspect and check propeller attaching bolts for tightness at least every 50 hours or annually. More frequent inspection may be necessary when climatic changes are extreme.

8. All wood and metal tipping repairs must be made at the factory or by an approved propeller repair station. If your propeller was manufactured with synthetic leading edge protection, a kit is available from the factory for repair of damage to the leading edge.

9. Check propeller balance whenever there is evidence of roughness on operation.

If your propeller begins to show any of the following damage, it should be retired from service:

- (a) Cracks in hub bore,
- (b) A deep cut across the wood grain,
- (c) A long, wide, or deep crack parallel to the grain,
- (d) A separated lamination,
- (e) Oversize or elongated hub bore or bolt holes,
- (f) An appreciable warp (discovered by inspection or through rough operation,
- (g) A appreciable portion of wood missing or,
- (h) Obvious damage or wear beyond economical repair.

Refer to FAA publication AC43.13-1B for further information.

**Table No. 1  
Optimum Wood Propeller Installation Hub  
Compression Method**

Hub Thickness (in.)	Desired Hub Compression	Bolts	Torque (Bolt Rev.)
3/ 3/8	0.020	3/8-24 1/2-20	0.49 0.41
4	0.024	3/8-24 1/2-20	0.58 0.48
4 3/4	0.029	3/8-24 1/2-20	0.68 0.57
5/38	0.032	3/8-24 1/2-20	0.77 0.65

**CAUTION: Final bolt torque should be within the range shown below, Table No. 2**

**Table No. 2  
Optimum Wood Propeller Installation  
Torque Wrench Method**

Size of Steel Aircraft Bolts		Recommended Wrench Torque (in-lbs)
Specification	dia (inches)	
AN6	3/8	200 +/- 25
AN7	7/16	250 +/- 25
AN8	1/2	300 +/- 25

**Ref. AN 01-1A-13 (1946)**

**CAUTION: Over-tightening propeller attaching bolts will cause the wood of the hub to crush, breaking its moisture seal and slightly reducing drive torque capacity of the installation.**

**Table No. 3  
Adapter Retention Bolts  
Recommended Wrench Torque**

Size of Steel Aircraft Bolts		Recommended Wrench Torque (in-lbs)
Specification	dia (inches)	
AN6	3/8	280 to 300
AN7	7/16	480 to 540
AN8	1/2	720 to 780

**My Restoration of a 1920s Airway Beacon**  
By Harvey Hartman - Somewhere in Texas

I have, at any given moment, about a dozen or so projects in the works ranging from something small such as a model railroad layout for my grandson to something large such as my Stearman biplane project. My wife says that I have too many projects but to my way of thinking, when a man runs out of things to do...he dies! (So, by my wife's estimates, I should live to be well-over 200 years old!) Anyway, here's one of my BIG projects: The relocation and restoration of a 1920s Airway Beacon.

Following the completion of the Transcontinental Railroad in 1869, coast-to-coast postal mail was handled by the railroads. This process, while reliable, was often slow so following WWI, the U.S Army Air Service started experimenting with aircraft for moving high-priority mail long distances. The mail was flown by open-cockpit biplanes during the daytime but attempts to fly the mail through the night resulted in too many pilots getting lost and running out of gas, often with fatal results. Therefore, the mail was transferred to trains when it got too dark for the pilots to navigate and when dawn broke, the mail was transferred back to waiting planes.

These transfers required cumbersome coordination between the air mail planes and the railroads and the excessive handling of the mail often resulted in misrouted or lost mail. Clearly, the solution was for aircraft to be able to fly through the night.

In an experiment to provide nighttime navigation for the pilots, bonfires were built at 10 mile intervals. Nighttime air navigation then became a simple matter of connecting the dots. In 1923, the Post Office began constructing a permanent NY-to-San Francisco transcontinental lighted airway with electric beacons and on 1 July 1924, postal authorities began regular around-the-clock operations. This new lighted airway cut two days off the coast to coast airmail run by eliminating the multiple transfers between airplanes and trains. Safety was also substantially improved because fewer pilots got lost in the dark. Responsibility for the airway beacon system was transferred to the new Aeronautics Branch of the Department of Commerce in 1926.

Much like the 1860s transcontinental railway, once the main coast-to-coast airmail route was established, additional routes soon followed. A southern east-west transcon-



tinental lighted airway was built between Los Angeles, CA and Atlanta, GA and this route passed through Dallas, TX. Houston was then connected to Dallas by a short north-south airway, then Houston-to-San Antonio, Houston-to-Austin, Houston-to-New Orleans, etc. In June 1927, more than 4,000 miles of airways were lighted and by 1933, more than 18,000 miles of airways were marked by 1,550 beacons spaced at 20 mile intervals across the US.

The first beacons were 24" in diameter, produced 1 million candlepower of light, and were mounted atop 51ft steel towers. However, starting in 1931 the new 36" diameter, 1.2 million candlepower Crouse-Hinds model DCB-36 rotating beacon quickly became the standard, including retrofitting the earlier 24" beacon installations. (The Crouse-Hinds beacon is noteworthy in that it was selected by the US Commerce Dept to modernize its coastal light-house beacons from carbon-arc to incandescent bulbs in the early 1930s.) To power the beacons, the towers were connected to the local electric utility when available but for the remote sites, a power shed with a gasoline generator was built. For daytime navigation, a large 70ft concrete arrow was poured as part of the installation and this arrow pointed to the next beacon.

The illustration on page 14 shows a typical early installation.

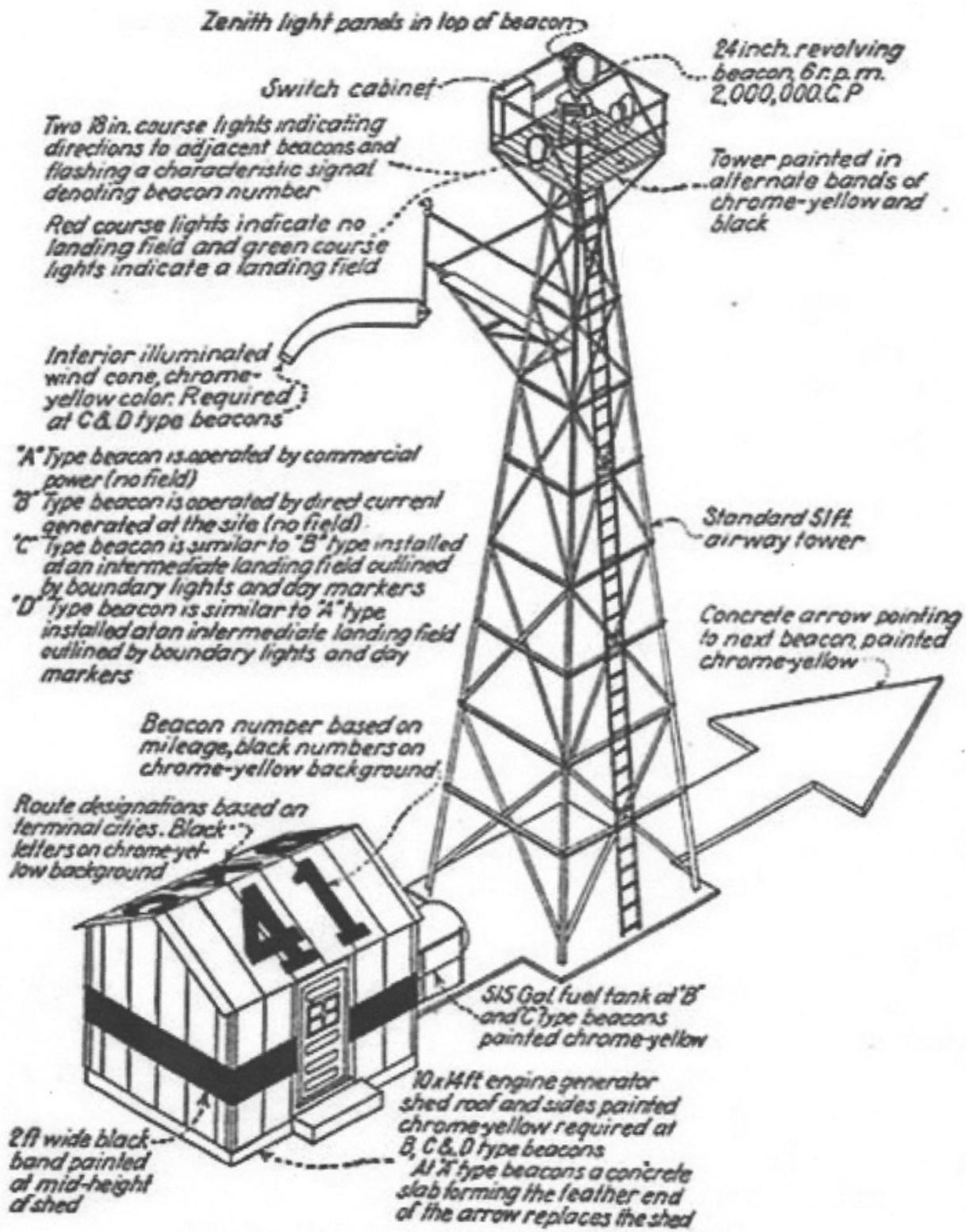
The rapid advancement of on-board electronic navigation equipment following WWII made the old lighted beacon system obsolete and it was decommissioned and dismantled in the late 1950s and early 60s. These beacons and towers were then donated to municipal airports across the US for use as airport beacons; one apparently ending up at the La Porte Municipal Airport on the southeast side of Houston.

In 2004, the La Porte airport received a federal grant to modernize its airport lighting facilities. This included

replacing its archaic rotating beacon and tower with a modern version. I didn't know at the time that this beacon was a nearly 80 year old remnant of the old airmail beacon system; I just didn't want to see this cool old beacon go to a smelter so I bid on and won the demolition and disposal contract of the beacon and tower. Over two weekends in July 2006, I and four of my Air National Guard buddies dismantled the tower and loaded everything onto two pick-up trucks and trailers. My intent was to erect the beacon on my property at a residential airport just west of Houston because our current beacon (a decrepit, low-budget affair) hadn't worked for several years. While we were dismantling the beacon, the La Porte's airport manager mentioned that his records on the beacon only go back to a post-storm inspection report following Hurricane Carla in the Fall of 1961 but he estimated that the beacon was probably erected on the airport sometime in the late 1950s or early 1960s.

Fast forward to today...

I have been restoring and erecting the old beacon tower on my property for almost three years now and I hope to have it finished sometime this winter. (And you thought that putting a new blade on your lawnmower was a major undertaking!) For being 85 years old, the old Ideco steel tower is still in good shape, owing much of its long life to the six to eight coats of thick paint on top of a galvanized undercoat. The beacon assembly is the later Crouse-Hinds model with a 1,200,000cp bulb, two giant 36" Fresnel lenses, and 6rpm rotating mechanism. My tower was likely originally part of one of the southeast Texas airways but since these towers were not serial-numbered, and the government didn't tightly control the transcontinental towers' salvage operation, no official documentation of what-ended-up-where has been found. Further compounding the identification/paper trail problem is that the beacon assemblies (which do have SNs)



were often exchanged for overhauled units when major repairs were needed; therefore, any information gleaned from tracing their serial numbers would be meaningless to the history of their tower.

The story of my restoration of a 1920s beacon tower follows.

Look for Part 2 in the next issue

## Classified Ads - - -

(Classified Ads are free to BPA members. Must contact BPA each issue in which you want the ad run.)

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**For Sale:** Pietenpol and Minimax. If interested contact Greg, 217-644-3210

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**For Sale:** Bradford Sky Scout Side-By-Side fuselage prints for sale. Uses standard Pietenpol wings and tail surfaces. Call Kyle at 517-663-3083 for information.

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**For Sale:** Pietenpol Air Camper. Ready for cover. All certified aircraft wood used in construction. Project is sitting on its landing gear. No engine. \$3000. Contact **Rod Elg** (Aguila, AZ), Home: 968-685-2660, Cell 907-250-1327

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**For Sale:** Pietenpol Construction DVDs.  
I have a series of HINT DVDs that chronicle the building process of my Pietenpol. Each volume contains live action video, still pictures and narrations on the process I used, methods of construction and modifications. Please visit Karetaker Aero, (karetakeraero.com) for detailed volume information and to order.

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**For Sale:** Lincoln Sport Biplane project \$7500. Write for details or call 1-206-854-6855. Will send picture and details of the aircraft in its present state. Myles J. Milner, EAA 9486.

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For Sale: Corvair Engine Block 62000 miles, \$250.00, call Bill at 419-898-7985 or email billair@amplex.net

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**For Sale:** Corvair engine HALF PRICE! 3100cc "Big Boy" conversion. Complete except for plug wires and carburetor. Crank inspection, case drilling and head welding done by William Wynne. Stainless exhaust professionally welded with sensor bung. Engine mount included. Built with all William Wynne parts including deep sump oil pan, dual ignition distributor, oil case assembly, oil filter manifold, prop hub, starter ring, front mounted John Deere alternator. New harmonic balancer. This is a new engine has not been run. Over \$8800 invested. Selling for \$4400 and I have all receipts. Cotant Neal nealfulco@gmail.com 504-957-3958( New Orleans area)

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**For Sale:** Brand new maple 72X40 prop for sale. It was carved by Jeff at Props, Inc and has fiberglass tip and leading edge protection. It was on my Model A powered Piet but never flown. Asking \$1000. Call 269-275-1982 or E-Mail at jamund1009@aol.com.

**Wanted:** Wing ribs, metal wing parts and wing spars for the single piece wing with the flop. Andrew King and I are trying to resurrect a 1934 Piet which came with no wing. Perhaps you have some parts from a project you will not use? We saved it from the wood pile and are trying to get it flying, making it the second oldest flying Air Camper (the Rudolph Piet is the oldest). Much obliged. Email Bob Coolbaugh at curtiss@shentel.net



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