EAGLE'S PROPWASH

July 2013 Issue

CHAPTER 113

"The Backyard Eagles"

President John Maxfield presenting EAA 113 Scholarship check to 2013 winner Willam Miller
photo courtesy Pat Trevas

Our Web Site: www.113.eaachapter.org EAA113@yahoogroups.com

Meetings: 7:30 PM the 3rd Thursday of each month at the

EAA 113 AVIATION EDUCATION CENTER

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Chapter Mission Statement

"EAA Chapter 113's major focus is on the relationships with people who have diverse aviation interests, centered around their love of flight, fellowship, learning, and fun. Chapter members have a passion for flying and are willing to share it with others. Chapter 113 provides the opportunity for exchange of information, as well as the interaction that leads to friendships that last a lifetime."

Board

"The Board of Directors are to provide both advice and assistance to the chapter officers on an ongoing basis."

PRESIDENT'S *PODIUM*

John Maxfield (248) 890-6767
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July 2013

Thunder woke me just after 4:15 am on Father's Day, and I was immediately reminded that despite all the planning we had put into our annual Fly-In, Mother Nature still held the final card. As the wipers cleared the rain from my windshield, I was happy to see the lights on in the Chapter meeting room, knowing Lou would have the coffee on and we'd make the best of the day regardless. The forecast was for gradual improvement throughout the day and we helped it along as our upbeat Chapter volunteers began to arrive and go to work. Our efforts paid off as the rain stopped and the clouds began to lift. We soon heard the drone of Dave James' helicopter on his way in to begin giving rides, one of the best reminders to the neighbors that there's good food and fun at the airport. By 7:30 we were in full swing parking airplanes and cars, serving up breakfast, and painting kid's faces. About a dozen or so aircraft flew in, adding to the member's planes and projects already on display. The weather continued to improve all morning so that by noon, the sun was out and the work of taking down the tents and putting away the grills was still a pleasurable task. In all, it was a safe and successful day, sharing our aviation passion with our guests and serving enough meals to fund next year's scholarships. Our sincere thanks to all that helped out, from the biggest task to the smallest detail, all were taken care of with enthusiasm.

The EAA Hangar was once again set up for dinner just a few days later as we kicked summer off with a barbeque prior to the monthly meeting. And once again, the enthusiastic members, spouses, visitors and friends filled the tables. Joining us as guests were former Chapter Vice-President Al Renaud and his wife Marcy, Ken Ladd, John Dawson, and Arthur Mumaw. Several of whom had been to the Sunday Fly-In and had their aviation interest rekindled. Jack Groat, David's father and partner in the RV-10 project joined the Chapter as did Bill Miller. Bill, who is this year's Chapter scholarship winner introduced his mother and grandparents at the meeting, as well. Both Randy Hebron and Shachar Golan made presentations from recent trips to the Otsego Lake Splash-In and flying general aviation aircraft in Israel respectively.

The final countdown is on for Oshkosh 2013. With so much to see and do there, Oshkosh veterans advise you to plan ahead. Events, schedules, and maps are available online to make the most of your time there. I'm planning to be there all week and look forward to flying the Ford a couple of hours each day. If you've got an empty seat in your vehicle, consider offering a ride to someone without. The EAA Chapter 113 Newsgroup on Yahoo is an excellent place to ask or offer such a favor. I received a note from Craig Taberner, Cessna 195 owner and Ford engineer in Australia. He'll be here on business later this month and is interested in a ride to Oshkosh. You may remember Craig from his visit to our February Chili Fly-In several years back.

As I'm writing this, the Sandbar Mitchell recovery team is in Alaska. We've asked them to bring us up to date on this herculean effort at the July meeting. Stay up to date with EAA 113 at www.113.eaachapter.org

Happy Landings, John Maxfield

PAULSON AVIATION & HISTORY *LIBRARY*

Barb Cook (734) 277-3469
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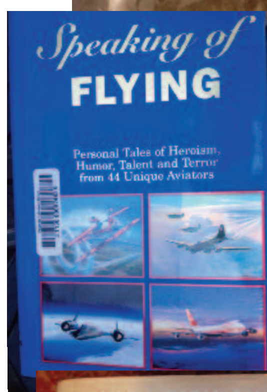
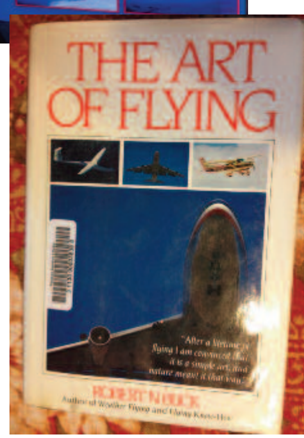
July 2013

3 BOOKS ABOUT WHY FLYING IS SO FASCINATING:

The Last Airmen; Exploring My Father's World
by Roger Rawlings. 1989. "Rawlings takes the reader aloft in rickety 1920s airliners, Pan Am Clippers, Flying Fortresses of WWII, and jets. He explores the culture and code of piloting, the tribulations of co-pilots, and current issues." (from the cover) 241 pages (Shelf 629.130 973 RAW)



Art of Flying
by Robert Buck 1984 (shelf 629.132 52 BUC)
"Getting down to Basics is the substance of this book, in which Buck tells how the smart pilot sharpens and uses his 'feel' for the airplane, and how the best pilots fine-tune their knowledge and skills to plan and handle their aircraft smoothly." (from flyleaf.)



Speaking of Flying; Personal Tales of Heroism, Humor, Talent and Terror
edited by Diane Titterington. 2000 (shelf 629.132 52 TI)
These stories are by 44 pilots who are speakers with The Aviation Speakers Bureau. Choose from Julie Clark, Scott Crossfield, Dick Rutan, Barry Schiff, Rod Machado and more.

Thank you, Don Ruff for these 3 books.

LIBRARY NEWS: Thanks to the generous donations from Don Ruff, Dave James, Flying Pilgrims RC Club, and Kathy and Frank Bitonti, we now have over 3200 items in our collection !!!

THE HUMAN FACTOR: TEACHING THE BIG PUSH

By Jay Hopkins / Published in Flying: Jun 26, 2013

(Submitted by Pete Waters)

Recently I received notification of an event I couldn't pass up — a "General Aviation Accident Reduction and Mitigation Symposium," sponsored by the Arizona Pilot's Association (APA) and the Arizona Safety Advisory Group (ASAG), which links many of the aviation groups in Arizona in the quest to reduce accidents, and especially fatal accidents, in the state. The FAA Arizona FAASTeam representative would also participate.

The message stated that the speakers would address the fatal accidents that occurred in Arizona in 2012, and those present would then "work toward strategies and tactics to reduce the accident rate in 2013." Questions and comments were solicited during and after each section, and the attendees were challenged to come up with specific actions that could reduce the number of accidents in the future.

While this led to some interesting discussions, ultimately people were frustrated by the realization that very few of the pilots who really needed to attend a safety seminar would ever show up unless mandated by an FAA safety counselor, and, in any case, there was no way the group could reach more than a tiny percentage of the approximately 26,000 pilots in Arizona through seminars, workshops and symposiums.

Even if we could reach a significant number of pilots, most of the accidents were caused by the same human factors that have been taking lives and destroying airplanes since the Wright brothers first rose from the sand dunes at Kitty Hawk in December 1903. I did come up with two possible strategies. In several cases, there were open fields the pilot could have landed on without causing much, if any, damage. Instead, the pilots crashed trying to make it to a runway.

I have been fortunate to have quite a bit of experience taking off from and landing on unpaved surfaces. My first flight was in a Piper J-3 Cub from a grass field, and I spent several years towing and flying gliders from grass runways.

It occurred to me that most modern pilots have probably never landed on a grass or dirt runway. Having not had that experience, they may not realize that airplanes can land with little or no damage on a relatively smooth field. It is hard enough to decide to land somewhere other than a paved runway, but it is an even harder decision if it is something you have never done before. I thought that, along with my recent suggestion that all student pilots would benefit from a few hours in a basic airplane like a Cub, it would also be beneficial if pilots had an opportunity to experience landing on an unpaved surface at least once during their training.

However, on further reflection I realized neither suggestion is practical. There probably aren't enough instructors with the necessary experience in simple convenional gear airplanes, and in any case, many insurance policies only cover landings on paved runways at certified public airports. So while it would certainly be nice if all pilots got to fly a basic, no-frills airplane and land on an unpaved surface, in reality that is not going to happen.

A more practical suggestion addressed the many fatal accidents that result from a pilot trying to turn back to the airport after an engine failure shortly after takeoff. Any pilot who experiences an engine failure after takeoff is faced with a critical situation requiring an instantaneous response that he has had no training for. I would guess that, by now, most pilots are familiar with what I discussed in my December 2010 column ("Big Push, Improbable Turn"), in which I emphasized the odds against successfully making it back to the runway after an engine failure below 1,000 feet. However, the sirens, whose tempting call to continue an unstable approach I wrote about in the March and April 2013 issues of Flying, also lure pilots into trying to turn back to the runway they just departed from that seems so tantalizingly close. The typical result is a stall/spin at low altitude, which is almost always fatal.

The first challenge the pilot faces after the engine failure is that he has probably never experienced a sudden loss of power while in a climb attitude. Power is almost always reduced while level or descending, so any pitch change required is minor. Thus, the pilot experiencing an engine failure after takeoff would have no idea how quickly and forcefully he has to push forward on the controls to maintain his airspeed. Coupled with the natural tendency to pull back when close to the ground, this can quickly lead to a stall just as the pilot is initiating the turn back to the runway.

A pilot who forcefully reduces his pitch attitude immediately faces a second serious challenge. In training he has been taught to make smooth turns with a maximum of 30-degree bank angle, and that it is especially important to keep the bank angle shallow at slow speeds just above stall. The simple fact is that an airplane starting a 30-degree banked turn with no power at 500 feet agl will likely hit the ground before completing a course reversal. This is because a 180-degree turn will take 30 seconds, and even at a conservative descent rate of 1,000 feet per minute, you would hit the ground in 30 seconds. So another reason a big push is necessary is that you are preparing for a steep turn of 45-degree bank at just above stall speed to get the airplane turned around as quickly as possible. With the increased bank angle, the descent rate will be even greater until you complete the turn.

A pilot who does not stall and actually completes a course reversal now faces his third challenge. If he was high enough that he could hold a 30-degree bank throughout the turn, depending on the wind direction and velocity, he is now approximately a half-mile to one side of the runway heading downwind, so his groundspeed is greater. He has to continue his turn for another 30 degrees and then glide for up to a minute more to actually make it back to the runway. If he used a 45-degree bank, the turn would only take about 15 seconds, so he would be much closer to the runway and would only have to turn about 10 degrees further and glide a much shorter distance back to the runway. A pilot who manages to meet all these challenges — pushing hard, banking steeply and gliding back to the runway — is now faced with a downwind landing with possible opposing traffic taking off toward him. Pull that one off, and you have become one of the few fortunate pilots to survive turning back to the runway after an engine failure on takeoff.

To emphasize the difficulty of turning back to the runway, while giving pilots a fighting chance to accomplish the maneuver if they have sufficient altitude, I propose that instructors have pilots practice the maneuver at a safe altitude during initial training and biennial flight review. (See "Practicing a Turnaround" below.)

This is actually a very good maneuver for practicing energy management and airplane control at minimum speed and maximum bank. It should be obvious from the results that a turn back in calm winds at an altitude below 1,000 feet in a high-lift airplane is a low-probability maneuver. For high-performance airplanes, 1,500 feet is usually the minimum altitude.

After impressing the student with the difficulty of completing the turn back successfully, this would be a great time to emphasize the importance of preflight planning and a self or crew briefing about what to do at various altitudes in the event of an engine failure after takeoff.

An engine failure on takeoff will always be a difficult situation to deal with, but with education and practice, we can certainly increase the odds of a successful resolution and reduce the fatal-accident rate. It would take the FAA years to make this an official change, so it would be up to instructors and flight schools to implement this on their own.

Practicing a Turnaround

1. Climb to 3,000 feet agl over a road or other straight line. (Don't even consider doing this maneuver right after takeoff or at a lower altitude!)
2. Establish a normal climb to the altitude you wish to use for demonstration (3,800 feet for a failure at 800 feet agl).
3. Note your position over the road.
4. Reduce the power to idle. (Don't forget carb heat if needed.)
5. Wait two seconds in order to simulate the time required to realize what has happened.
6. Push the wheel forward to maintain the best glide speed.
7. Roll into a 45-degree banked turn into any crosswind
8. Turn 190 degrees while just above stall (with stall warning barely on).
9. Roll out and line up with the road.
10. Note your position and altitude relative to the starting point.

from Dave English: *The Air Up There; More Great Quotations on Flight*

BECAUSE I FLY

Because I fly
I laugh more than other men
I look up and see more than they,
I know how the clouds feel,
What it's like to have the blue in my lap,
To look down on birds,
To feel freedom in a thing called the stick…
Who but I can slice between God;s billowed legs,
and feel then laugh and crash with His step
Who else has seen the unclimbed peaks?
The rainbow's secret?
The real reason birds sing?
Because I Fly,
I envy no man on earth.

-- Anonymous

EAA 113 PICNIC/BBQ

Photos Courtesy
of
Pat Trevas

FATHERS' DAY PANCAKE BREAKFAST

Photos Courtesy
of
Shunsuke Shibata

The Flipping Crew

Big Thumbs Up

Mark Freeland's
Retro RC Display

MORE FATHERS' DAY PANCAKE BREAKFAST

Trio of Schweitzer SMG 2-37s flown in by the Tuskegee Air Museum
Photo Courtesy of Shunsuke Shibata

Carl's Ercoupe
Photo Courtesy of Shunsuke Shibata

Cessna 195
Photo Courtesy of Shunsuke Shibata

ROBOHORSE

By Peter Garrison / Published in Flying: Feb 27, 2013

In 1992, Scaled Composites built a radio-controlled UAV intended for 48-hour flights at 65,000 feet. Called Quiver (it was later changed to Raptor, for “Responsive Aircraft Program for Theater Operations”), it had a wingspan of 66 feet and an 80 hp Rotax engine . Scaled also home-brewed the autopilot, and there was some uncertainty about how it might behave before its rates and gains had been properly adjusted. In order to avoid losing the prototype on its first flight, Burt Rutan came up with the idea of providing it with a human safety pilot who could take over in case something went wrong.

Now, the Quiver was designed to carry a 150-pound payload, including a couple of underwing anti-missile missiles, but its skinny fuselage did not have a cockpit, or even room for one. Rutan solved the problem with his customary ingenuity and sublime indifference to human comfort. A backrest and safety belts — but no windshield — were added on top of the fuselage, along with makeshift links to the primary flight controls. Test pilots Mike Melvill and Doug Shane, the latter now Scaled’s CEO, climbed into the makeshift saddle for the first flights.

hane later described flying in the open air, astride the airplane and behind the beating propeller, as “a new and unwelcome experience.” Landings were particularly harrowing. Melvill recalled “how hard it was to let [the remote pilot] land and not grab the controls.”

On a seemingly unrelated topic, I remember watching in awe, as a small boy inside New York skyscrapers, as a liveried elevator man made a series of subtle adjustments with an ornate brass lever to bring the floor of the elevator to rest in perfect alignment with the floor outside. It seemed like a beautiful example of human skill and adaptability; how cruel to discover that elevators could be made to mind themselves!

Did the first riders in automatic elevators, invited to believe that the touch of a button would carry them up that terrible dark shaft and deposit them safely at their destination, feel the same qualm as Shane and Melvill surely did as their fingers first followed the tremors of a stick controlled from afar?

Or as our children will, when they first board an airplane without a pilot or a cockpit?

The idea of passenger-carrying airplanes without pilots usually comes up in relation to the increasing automation of airliners and — it is rumored — the withering away of basic flying skills in their pilots. But the designers of our future, when they are figuring out how (but not why) to put people on Mars, are meditating a different kind of autonomous flight. The concept is something we have seen in movies and illustrations depicting cities 100 years hence: aerial taxis whizzing among the towers, delivering their occupants to destinations they would have reached, in the olden days, by taxi or light rail.

These are PAVs — personal aerial vehicles — and in their taxi-like commercial form, NASA Langley’s Mark Moore calls them Zip Aircraft, after the Zipcar model of distributed car rental. In the Zip model, locked cars are left by their drivers at their destinations; a person needing a car finds one nearby and makes a reservation through an online service, then opens and drives the car with a smart membership card.

The assumption underlying Zipcars is that most people know how to drive. The obvious difficulty, when considering an aerial version, is that most people do not know how to fly. The solution would be an airplane that flies itself — you tell it where you want to go, and it takes you there.

Although Moore is careful to describe his studies to date as merely exploratory, he is optimistic about the future of PAVs and particularly about the potential of electric power. Electric motors open up possibilities for structural and aerodynamic advances, increased reliability, reduced noise and pollution, and reduced acquisition and operating costs, but they suffer today from the inadequacy of even the best current batteries. For a given powerplant weight, an airplane cannot go nearly as far on battery power as it can on a like mass of liquid fuel. Moore argues, however, that experimental batteries now in development, which should be commercially available by the end of the decade, could provide a four-seat airplane with a range of 200 miles, and that would be sufficient for most PAV trips. Hybridizing the powerplant with a small, range-extending internal-combustion engine would take care of longer trips, at least until still-better batteries arrive.

NASA's Kenneth Goodrich, who is studying the problems of autonomous flight, imagines pilot and airplane sharing responsibilities. He speaks of "inner loop" and "outer loop" skills. The inner loops consist of basic ship-handling: staying right side up, managing power, maneuvering, maintaining speed and altitude, navigating among defined waypoints, even controlling the approach and landing. These are tasks, some more complex than others, that "are dealing with relatively straightforward/deterministic signals and physics." In other words, either things are where they should be, or some clearly defined action is required to get them there; there are no ambiguities.

Goodrich compares a semi-autonomous airplane — one with just inner-loop capabilities — to a well-trained horse. "The airplane has instinctive or reactive intelligence (which is much simpler than general human intelligence) relative to expected environmental factors and is generally biased toward self-preservation in the absence of decisive pilot direction." If you do the wrong thing, or do nothing, the airplane finds its way to some safe condition.

Outer loops involve more abstract types of perception and decision-making, ones for which we now consider the human mind indispensable. The variety of situations that can arise in flight, and the complexities of dealing with them, seem far beyond the grasp of any imaginable computer program. It is difficult to imagine a machine possessing the combination of situational awareness, initiative, judgment and resourcefulness that a good pilot possesses, and so pilots — not to mention everybody else — tend to be skeptical of the idea that full responsibility for the execution of a flight could be entrusted to automata. It is sufficient to mention Sullenberger and the Hudson, and the case is closed.

But even full autonomy may prove more attainable than we suppose. I suspect that in 1970 the people who operated what then passed for digital computers would have said that no non-professional could ever be expected to manage one; yet today we all use them routinely. It's partly a matter of people learning new skills, and partly one of tasks being redefined to allow computers to handle them.

I can imagine — Moore and Goodrich suggest nothing of this sort — airplanes without pilots operating in a highly regimented environment under some sort of central or distributed external control. They would fly at altitudes and along routes chosen to mesh with other flights. A PAV might join a flock of others moving along a sort of three-dimensional city street, and formate more closely with them than normal pilots would dare. Conflicts would be avoided not by improvising a response to each new event, as humans do, but by ensuring that no unexpected event occurs. Philosophically, however, this model is opposite to that of the coming NextGen air traffic system, in which the role of central control is diminished rather than increased and decision-making is distributed among the airborne participants.

Whatever mix of autonomous control and piloting skills flying might eventually require, the implementation of the Zip Aircraft concept does not imply the extinction of aviation as we know it today. One area of current study is how to integrate large numbers of PAVs into present traffic. PAVs are expected to operate at low altitudes, from special airports or special parts of existing airports, and on routes that would avoid conflict with other types of traffic.

Of course, we know that pilotless airplanes are already here. It's certain that they will increase in number and take on more and more diverse tasks, including the carriage of cargo, and will learn to mingle unobtrusively with piloted airplanes. But will they ever carry people? Before we prepare to hang up our goggles and scarves in the temple of Daedalus, we should take some comfort from Ken Goodrich. "Elevator-like autonomy," he says, "could be an option in the distant future (20 to 30-plus years), but it's far beyond the state of the art today."

Tech Raptor

What's it like to ride in — or on — an airplane with no pilot? Harrowing, says Mike Melvill, who has.

TECHNICAL COUNSELOR'S NOTES

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July 2013

THE ROOTS OF THE EXPERIMENTAL

(from *Flying,* May 2013)

The roots of the experimental category go back to 1947, when an Oregon pilot named George Bogardus resurrected a tiny single-seat airplane, built before the war, when Oregon licensed aircraft at the State level. He obtained a special permit and flew Little GeeBee from Oregon to Washington, DC, making three trips between 1949 and 1951. Along the way, he garnered support for his petition to allow individuals to build their own airplanes and license them at the Federal level. It's almost inconceivable today, given the state of Congress and the federal bureaucracy, but in 1952 it worked. The CAA inacted regulations giving individuals a way to license airplanes built without type or production certificates. As long as these airplanes were built for a person's "education and recreation," the CAA said, as long as they were not used for commercial purposes, they could be licensed in a new "Experimental" category. Later in life, Bogardus' interests drifted away from aviation, and Little GeeBee was indifferently stored away. Dick VanGrunsven, founder of the giant Van's Aircraft, helped recover the airplane and headed a restoration effort. EAA Chapter 105 contributed the labor, and in 2006 Little GeeBee returned to Washington, DC, where it is displayed in the UdvarHazy wing of the Smithsonian's Air and Space Museum.

Photo Courtesy of Scotch Canadian, Smithsonian

July 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2		4	5	6 BREAKFAST AT CANTON CONEY ISLAND
7	8	9	10	11 EAA 113 BOARD OF DIRECTORS MEETING	12	13 BREAKFAST AT CANTON CONEY ISLAND
14	15	16	17	18 EAA 113 MEETING AT METTETAL AIRPORT	19	20 BREAKFAST AT CANTON CONEY ISLAND
21	22	23	24	25 EAA 113 FLYING SAFETY MEETING	26	27 BREAKFAST AT CANTON CONEY ISLAND
28 AIRVENTURE 2013 →	29 →	30 →	31 →			

EAA Chapter 113
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Next Meeting : Thursday, July 18, 2013

6:30 PM at the EAA Aviation Education Center