



Freeman Flash

**NEWSLETTER of the FREEMAN FIELD
FLYING ASSOCIATION**

Volume XXI, Number 11, **December, 2019**

Larry Bothe, Editor

Website: www.freemanfield.org

Two New FFFA Board Members

FFFA Meeting News

Christmas dinner and annual meeting:

We had 34 people at our Christmas dinner and annual meeting, up from 28 last year. North Carolina-based Jim Zazas even attended, and received the imaginary award for furthest-traveled. Helmut Weislein and wife Barb came in 2nd, having driven up from Shepardsville, KY. President Karen James gave a recap of the year's activities. Treasurer Larry Bothe noted that since we shut off the utilities in the FFFA suite of rooms (we now meet in the museum) we have gone from losing about \$700 a year to coming out \$12 ahead for the most recent year. We had enough door prizes that everybody got something. Thanks to those who donated the prizes.

The Christmas dinner is also our annual meeting, during which we elect officers for the coming year. We have two new directors, one of whom also assumes the role of Secretary. Zack Grant was elected to the director position that came open when his father, Berl, passed away this fall. Attorney Brett Hays (also Creative Director of Fear Fair) was elected to the position of Secretary.

Next meeting, Jan 9th: Our January meeting is usually given over to planning activities for the coming year. We'll want to do that, and we would like to hear from you about what you would like to do in 2020. Our

series of short educational topics (Power Point presentation followed by discussion, Wings credit provided) that we started in the middle of 2019 met with some success, and we would like to continue those presentations in 2020. In order to do it we need ideas about what topics you would like to have reviewed. Please let Karen or Larry know what's on your mind.

Airport News

The truth is, for the first time in several years, your editor didn't make it to the airport authority meeting on Monday evening. I was in Chicago on Sunday and Monday, and the snow around Indianapolis delayed my return until it was too late to attend. However, I did stop by the airport on Tuesday and spoke to the secretary, Diane Schepman. She takes the notes and creates the minutes for the meetings. Diane advises that the meeting was largely routine business. No momentous decisions or announcements were made.

Member Accomplishments

Bob Sneberger (Seymour's aerial applicator) **passed his ATP "written" test.** During these winter months he has been working part-time at Honaker Aviation at Clark Regional Airport in Sellersburg, IN as a mechanic. As soon as he can get type-rated he will be flying jet charter for them.

MERRY CHRISTMAS

Museum Archives

News of the Freeman Army Airfield Museum



The Freeman Army Airfield Museum is a completely separate entity from the Freeman Field Flying Association. Some of our board members (L. Bothe, K.

James) overlap. The FFFA on occasion supports the museum with gifts of money for worthy projects.

FMI www.freemanarmyairfieldmuseum.org.

We have been cleaning up loose ends at year closes. There is one new display; World War Two Fighter Aces, featuring some Chuck Yeager memorabilia. We are getting ready to catalog the books we have received for our library over the past year or so. To that end we have purchased a label printer for the spine labels. Three other projects; the window to a WWII ramp scene, the large-format Freeman Field development timeline photos, and a WWII Freeman Field picture book (for resale), will not be completed until after the first of the year.

On 12/19 museum president Joe Clegg brought his WWII J33 Allison jet engine to the museum on long-term loan. The J33 powered the first US jet fighter, the P-80 Shooting Star.



And speaking of jet engines, the National Air & Space Museum notified us that they will at long last consider our to receive a German Jumo 004 jet engine. This is the engine that powered the Me-262 German jet fighter, and is a cut-away version so you can see the internal workings. We are hopeful that we will be chosen to receive one of two of these engines that are excess to NASM.

We finished our storage and filing reorganization in November, but we still lacked a door separating the revamped storage area from the public part of the museum. Joe Clegg and Marty Schwab are installing a sliding door. Along the way they have replaced a section of drywall and added insulation to the exterior wall in that area.

The museum adopted a 5-year long-range plan in November. The next step is to obtain volunteers (from the existing Board) to head up the goals for the 2020 plan-year. Chief among those goals is to create, formalize and execute a plan to obtain additional volunteers in order that there are enough people, with the right skills, to achieve the remainder of the goals. Larry Bothe will head up the volunteer recruitment effort.

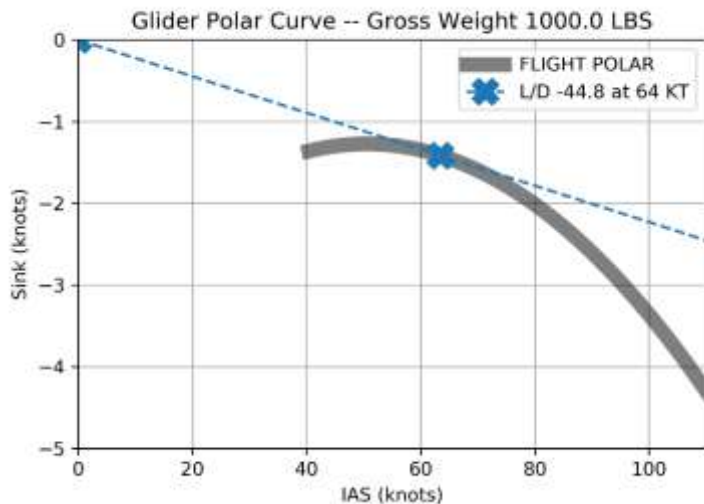
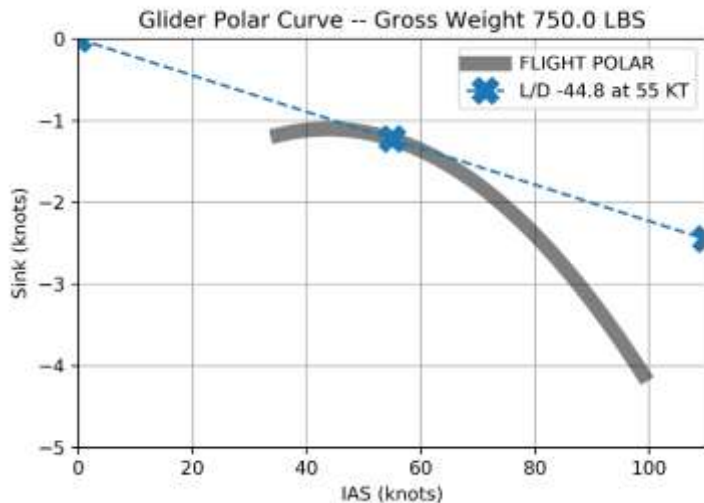
LSC Glider Topics

Glider Performance, Part 1

By Bob Walker (OB1)

This month's article is a brief discussion of basic glider performance. Much of the article makes use of graphs called "polar curves" that show sink rate for a range of airspeeds. These curves are measured by the manufacturer during flight tests and published for each glider model. They are the basis for calculating glide ratios and optimum speeds to fly. As a result, they are the foundation for calculations done by onboard glide computers.

Below you'll find two polar curves for the Schleicher ASW-27B glider. The ASW-27B is a high-performance glider with a 15-meter wingspan. Its performance makes it highly competitive in national and world competitions. The curves were plotted for a gross weight of 750 lbs. and a higher gross weight of 1,000 lbs. Water ballast, carried in the wing, is used to increase the gross weight for high performance gliders. Later in the article, the advantage of carrying water ballast and operating at higher gross weights will be discussed.



The polar curve (gray) resembles an inverted parabola. The aerodynamic properties of lift and drag, along with the relationship of coefficient of lift to coefficient of drag, drive the unique shape of the flight polar. Enough said about that.

CALCULATING GLIDE RATIO

The polar curves show sink rate and airspeed in knots. This makes calculating glide ratios very simple. For example, the polar for 750 lbs. shows a sink rate of 1.23 knots at an airspeed of 55 knots. The glide ratio is calculated by dividing 55 by 1.23, resulting in a 44.8:1 glide ratio. In a perfect world with still air, which never happens, the glider would travel 44.8 feet forward while descending only 1 foot.

MINIMUM SINK RATE

Minimum sink rate is found at the apex on the polar. In the case of the 750 lbs. glider, the minimum sink is 1.1 knots at an airspeed of 45 knots. In perfectly still air and a 1G load (no bank) 45 knots would result in the minimum attainable sink rate.

MAXIMUM GLIDE RATIO

The dashed blue line tangent to the polar curve shows the maximum glide ratio in still air. For example, in the 750 lbs. polar, the maximum glide ratio is 44.8:1 at an airspeed of 55 knots (often referred to as "Best L/D" speed). Flying faster or slower than best L/D speed results in a reduced glide ratio.

ADVANTAGES OF WATER BALLAST

When strong thermals are predicted, high performance gliders often carry water ballast in the wings. At first, it might seem counter intuitive to intentionally add weight to a glider. However, the performance benefits can be significant. Carrying additional weight does not change the maximum glide ratio of a glider. It simply increases the speed at which best L/D occurs. The two polar curves tell the story. Regardless of the weight, the maximum glide ratio for the ASW-27B is 44.8:1. At 750 lbs., best L/D speed is 55 knots. At 1,000 lbs., best L/D speed is 64 knots.

Glidery, especially in competition, are routinely flown at airspeeds greater than best L/D. In competitions, speed is a primary objective. Winds, thermal strength and weight are a few of the factors that determine the optimum speed to fly to maximize course speed. In some conditions, the inter-thermal cruise speeds can approach 100 knots.

Let's take a look at ASW-27B glide ratio for the two different weights when flown at 100 knots. The 750 lbs. polar shows an approximate sink rate of 4.2 knots at 100 knots, a glide ratio of 23.8:1 (100/4.2). At 100 knots the 1,000 lbs. glider has a glide ratio of 29.4:1 (100/3.4). When operating at

relatively high speeds, ballast can substantially improve the glide ratio.

As you might have guessed, there must be a downside to carrying ballast. A heavy glider will climb more slowly. However, on days with strong thermals, the penalty is relatively small. Referring to the polar curves, the minimum sink rate for 750 lbs. glider is 1.1 knots, and the minimum sink for the 1,000 lbs. glider is 1.3 knots. The difference is only 0.2 knots. In other words, in conditions where the lighter glider is able to climb at 5 knots, the heavier glider would climb at 4.8 knots. [Admittedly, this calculation does not take into consideration bank angle, effects of G loading and the radius of the thermal. However, it's close enough for this discussion.] In spite of the slower climb rate, the heavier glider can cruise between thermals at higher speeds, resulting in less time around a course.

MORE TO COME

Although this article focused on glider performance, the basic principles also apply to powered aircraft. For example, large transport aircraft descend well above their best L/D speed. This results in heavy aircraft beginning their descent earlier than light aircraft. In short, heavy aircraft have a better glide ratio than the light aircraft when operating well above best L/D speed.

Below is a small table showing glide ratios for various aircraft. (Source: Wikipedia)

Aircraft Model	Glide Ratio
EB29 Glider 29 Meters	68
Schleicher ASW-27B Glider	44.8
Perlan II Glider	40
Boeing MD11	16.1
Boeing B767-200 ER	16.1
Boeing B757-200	15.0
Airbus A300-600	15.2
Cessna C172	12.1
Piper Cherokee 180	11.2
Space Shuttle (approach)	4.5

Ed. Note: I question the Wikipedia glide ratios presented above. The calculated glide ration for a 1978 Cessna 172 is 9.1. No Skyhawk I know about has ever managed a 12.1 glide ratio. I don't think a PA-28/180 will do 11.2, either.

This article focused on the basic polar curve. The examples were theoretical and assumed ideals conditions. In the next article, we'll cover real life cross country flying in a glider. This will include planning tools, picking a route, adjusting for winds, when to thermal, when to cruise and establishing safety margins. Stay tuned.

Glider Operation Information

The Louisville Soaring Club would like aircraft flying at SER to know that the gliders almost always operate off runways 14/32. However, that does not mean that the wind favors 14 or 32. The gliders and tow plane use 14/32 because it is convenient to where the gliders are stored. ... All the gliders have radios. When approaching the field, especially on weekends, call addressing *Seymour Glider Operations* and ask where the gliders are; they will tell you. It actually works best, when glider operations are in progress, for power planes to use 5 or 23. FMI www.soarky.org, or call President Bob Walker at 502-314-3519.

FFFA Officers - Contacts

Karen James, President, 812-498-4482
Flygirl172@me.com

Jan Sipes, Vice President, 812-522-9446
sipesj@hotmail.com

Brett Hays, Secretary, 812-528-2186
brett.hays@smithlawservices.com

Larry Bothe, Treasurer/Membership, 812-521-7400
LBothe@comcast.net

Barty Moffett, Board, 812-528-0012
barty@barty.com

Tom Hallow, Board, 812-569-4293
thallow@3cbb.com

Zach Grant, Board, 317-201-4293
L1011jock@sbcglobal.net

Ask an Instructor/Airline Pilot

Do you have a question about some phase of aviation? It could be about pilot certification, logging flight time, FAR's, how airlines do things, instrument flight, or anything else. Send a message to Adam Springmeyer at adam.springmeyer@gmail.com and receive a personal reply directly in your e-mail.

Local Event Calendar at a Glance

Jan 9, FFFA meeting, program TBD
Mar 31-Apr 5, Sun 'n Fun 2020, Lake land, FL
Jun 6, Columbus Airport Day, details later
June 13, Museum Airplane Ride Day, SER
Jul 20-26, AirVenture 2020, Oshkosh, WI
Sep 26*, Madison Air Show, 1PM, IMS

*An asterisk means Cliff Robinson will be performing an air show at that event. If you want to see world-class aerobatics with no admission charge, attend one or more of these events.

Freeman Field Flying Association meets the 2nd Thursday of each month, 7:00 PM, at the Freeman Army Airfield Museum. No meeting in July. Christmas dinner in December.

Airport Authority meets the 3rd Monday of each month at 7:15 PM, terminal building conference room.

Museum Board meets the 3rd Tuesday of each month, 6:15 PM, main museum building, map room.

Join FFFA: Dues are \$10 per year. Send a check, payable to FFFA, to Larry Bothe, 1082 Governors Ln, Seymour, IN 47274-1135. Include e-mail address and phone number. ½ price after the 4th of July.

Freeman Flash issues going back to 1999 are available if you contact the editor.

Sell – Buy

Have something you want to sell or buy? FFFA members get a free ad. Send an e-mail to LBothe@comcast.net to place an ad.

Cherry Hill Aviation

Aircraft Maintenance & Annual Inspections
Tube & fabric work a specialty
Aircraft sales, rental & flight instruction
Lance Bartels 812-322-6762

Cliff Robinson Aerobatics

Open cockpit bi-plane rides in 500HP Stearman.
Acro and tailwheel training in Super Decathlon.
Cliff Robinson, Madison, IN 812-701-9990
cliffrobinsonaerobatics.com

Eagle Avionics

Radio repair and installation, shop at BAK
Authorized dealer for Garmin, Aspen, Avidyne,
Lynx (L3), Dynon, Stratus, and several others.
Contact Eagle Avionics for your ADS-B solution.
Transponder & IFR certification at your airport
Call Andy Zeigler, 812-344-0468

Larry Bothe, Certified Flight Instructor

Flight Reviews, Insurance Checkouts,
Instrument Proficiency, but no beginning-to-end
certificate programs.

812-521-7400

The Engraver

Trophies Plaques Gifts Plastic Signs

Quality Gifts & Awards, Aircraft Placards
1520 Schleter Rd, Seymour. 812-522-6181

www.engraverinc.com