the Ampeer

March | The EFO Officers | 2022

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No Mailed Ampeer Subscriptions

The Next EFO Meeting: Wednesday, March 9, 2022
Time: 7:30 p.m., Place: Zoom

What's In This Issue:

The February 2022 Ampeer Quiz

By Ken Myers

In the February 2022 issue of the *Ampeer*, I asked the following question, "What range of data do all 12 planes share?"

https://theampeer.org/ampeer/ampfeb22/ampfeb22.htm

The answer, that I was looking for, was that all 12 planes range between 9 oz./sq. ft. to 10 oz./sq.ft.

I apologize for not making the question clearer.

Many modelers, in the USA, use ounces per square foot to form a "group" that somehow relate to each other in some way. Some may call it a "flyability" level or a group of planes with similar flight characteristics.

The twelve plane group contains; four sailplane/gliders, two EDFs with different aspect ratios (ARs), two aerobatic types with one being a sport type and the other somewhat scale-like, a sport high wing/parasol, a low-wing old-timer type, a flying wing and a somewhat small biplane.

Their wing spans ranged from 28.2 inches to 98.5 inches. The flying weights ranged from 19.4 ounces to 49.3 ounces.

The question then becomes, is this really a realistic grouping for any purpose?

The URL link has been removed from the original 12 plane table. The wing area loading is now noted, along with the approximate stall speed based on Keith Shaw's formula; stall speed in miles per hour equals the square root of the wing area in square feet times 3.7.

The table now shows that the stall speeds range from 11.1 mph to 11.7 mph. This is not surprising as Keith's formula is based on the square root of the wing area loading, and they all are in the same range of wing area loading; 9 oz./sq. ft. to 10 oz. / sq. ft.

There is now a viable reason to group them together. If the flying speed is kept above 12 mph with any of these models, it should not stall, but…

The 28.2" wing span F-15 will "look" and be perceived in the air very differently from either of the 98.5" Preludes flying at 12 mph. They will also "handle" very differently in the air because of their wing

HH E-flite F-15 Eagle 64MM Basic
551 sq. in./144 = 3.83 sq. ft.
34.4 oz./3.83 = 8.98 oz./sq. ft.
Stall Speed = 11.1 mph

Lockheed T-33 (foam-plans)
400 sq. in./ 144 = 2.78 sq. ft.
25 oz./2.78 = 8.99 oz./sq. ft.
Stall Speed = 11.1 mph

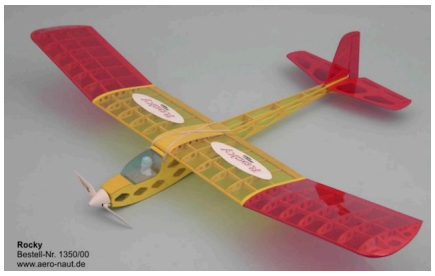
Mountain Models Switchback Sr.
600 sq. in./ 144 = 4.17 sq. ft.
38.3 oz./4.17 = 9.18 oz./sq. ft.
Stall Speed = 11.2 mph

Aero-naut LT 200 Flex
468 sq. in./ 144 = 3.25 sq. ft.
30 oz./3.25 = 9.23 oz./sq. ft.
Stall Speed = 11.2 mph

BMJR Panther
299 sq. in./ 144 = 2.08 sq. ft.
19.8 oz. / 2.08 = 9.52 oz./sq. ft.
Stall Speed = 11.4 mph

TopModel Prelude REF
713 sq. in. / 144 = 4.95 sq. ft.
47.6 oz. / 4.95 sq. ft. = 9.62 oz./sq. ft.
Stall Speed = 11.5 mph

HH E-Flite Opterra 2M Flying Wing BNF Basic with AS3X
1033 sq. in. / 144 = 7.17 sq. ft.
69 oz. / 7.17 sq. ft. = 9.6 oz./sq. ft.
Stall Speed = 11.5 mph

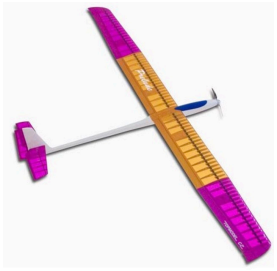


Aero-naut Rocky Electric Glider
286.8 sq. in. / 144 = 1.99 sq. ft.
19.4 oz. / 1.99 sq. ft. = 9.75 oz./sq. ft.
Stall Speed = 11.6 mph

Retro RC Chicken Hawk
236 sq. in./ 144 = 1.64 sq. ft.
16 oz./1.64 = 9.76 oz./sq. ft.
Stall Speed = 11.6 mph

StevensAero Edge 540 Pattern 3D Aerobat
440 sq. in. / 144 = 3.06 sq. ft.
30 oz. / 3.06 sq. ft. = 9.80 oz. / sq. ft.
Stall Speed = 11.6 mph

StevensAero FREDe 2X ToonScale Slow Flyer
1050 sq. in. / 144 = 7.29 sq. ft.
72 oz. / 7.29 sq. ft. = 9.88 oz./sq. ft.
Stall Speed = 11.6 mph



TopModel Prelude 2.5 Meter
713 sq. in. / 144 = 4.94 sq. ft
49.3 oz. / 4.94 sq. ft. = 9.98 oz./sq. ft.
Stall Speed = 11.7 mph

spans and aspect ratios. To maintain flying at 12 mph, or above, the landing approach angle of the F-15 will be much steeper than that of a Prelude. The two different types of planes will "appear" to land very differently but both will require a flying speed of at least 12 mph.

Power loadings have not been taken into consideration.

Hopefully it is understood that the various types of planes being compared here, flying in their typical fashion during a typical "flight mission" will perform very differently in the air because of their specifically designed airframe flight missions.

There is one "rule of thumb" that is apparent using the wing area loading; "Planes with a wing area loading of between 9 oz. / sq. ft. and 10 oz. / sq. ft. should be kept at about 12 mph, or faster, to keep from stalling."

There are other factors that influence the stall. The airfoil chosen is one, as well as whether the wing has a way to modify the airfoil using flaps and/or spoilers, but for the most part, 12 mph seems like a good "rule of thumb".

The question is now, "Is there a more useful, and meaningful way to find a mathematical model to compare these planes more realistically and not just by their stall speed?"

Keith Shaw's "Rule of Thumb" For Stall Speed

By Ken Myers

"Rules of Thumb" allow us to more easily grasp difficult concepts with an ease of use application. "Rules of Thumb" are NOT the exacting standards that an engineer would use, but simplified mathematical models to achieve approximations using simple methods.

There are specific mathematical calculations, that can be applied to a specific aircraft's design, to achieve a stall speed number under various conditions.

Keith's "rule of thumb" formula does provide an approximation for planes with a specific wing area loading; stall speed, in miles per hour, equals the square root of the wing loading, oz./sq.ft. times 3.7.

How good is it?

Full scale P-51D Mustang

https://en.wikipedia.org/wiki/North_American_P-51_Mustang
Wing Area: 235 sq. ft.

http://www.wwiiaircraftperformance.org/mustang/p-51d-na-46-130.html
Landing Gross Weight: 9071 lb. or 145,136 oz.
145,136 oz. / 235 sq. ft. = 617.6 oz./sq. ft.
Square root of 617.6 = 24.851559
24.851559 times 3.7 = 91.95 mph
http://www.wwiiaircraftperformance.org/mustang/p-51d-na-46-130.html
Given stall speed on above Web page: 95.4 mph

That is close enough for me to accept Keith's "rule of thumb" as quite valid.

The January 12, 2022 EFO Zoom Meeting

The pandemic seems to be infecting more folks all of the time now, so the Wednesday, January 12, 2022 meeting was held over Zoom.

There were six EFO members present; Roger Wilfong, Keith Shaw, Dave Stacer, Rick Sawicki, Jim Pollack and Ken Myers.

There was a lot of general discussion about the state of our lives now.

There was good news from **Dave Stacer,** he's a new grandpa and **Roger Wilfong** announced that he'll be reaching grandfather status in March. Congratulations guys!

Ken Myers talked about calculating the wing area for the Retro RC Chicken Hawk and showed the photos of how he did it using the "weight method". The how to for this method is in an this *Ampeer*.

Keith Shaw talked about spending a lot of time cleaning up his "household tools" in his basement and the discussion broadened into getting our building areas and modeling tools cleaned up as well.

Dave Stacer lead a discussion on the FrankenRadian.

The FrankenRadian is a sailplane project of the Midwest RC Society. He also shared some photos from the RC Groups Website. EFO, and Midwest RC Society member, Denny Sumner, has the build thread for this project on the RC Groups site.
https://www.rcgroups.com/forums/showthread.php?3942055-FR1-Frankenradian-%28With-Plans%29

Photo of Denny Sumner's FrankenRadian from his build thread

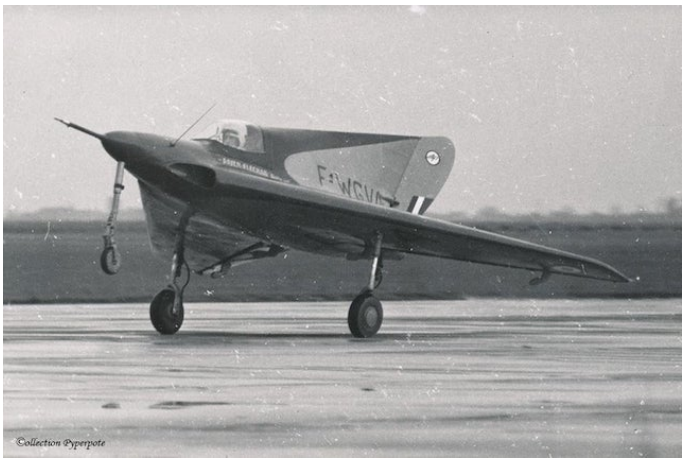
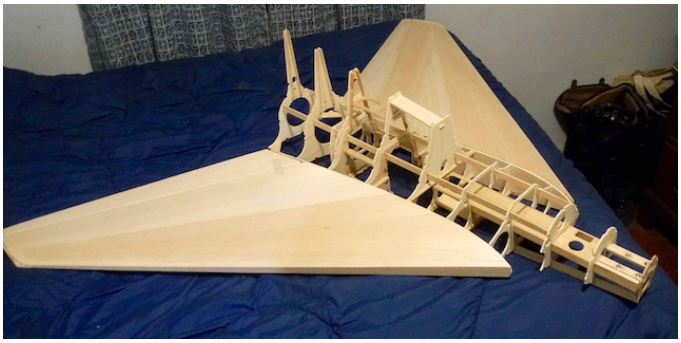


Photo of full-scale Payen Pa 49 Katy

Ken Myers asked **Keith Shaw** if he'd ever finished up the KATY that he'd started back in February 2015. The Payen Pa 49 Katy, was a French experimental tailless aircraft that was first flown in 1954.

Keith told us that even though he'd gotten a long way into the project, the "numbers" were not looking good, so the project was abandoned.

On Feb. 10, 2020 I received an email from Keith noting the end of this project. He stated, "Sometimes the best thing to do is to drop back ten and punt... It wouldn't be the first time that I had to build multiple testbeds before the scale model can be successful."



I put a few photos here that show how far he'd gotten into the project.

The date for the 2022 Mid-Am was announced. It will be on Saturday, July 9 and Sunday, July 10. It will be run the same way as last year, and the Saturday chefs have already volunteered. ;-)

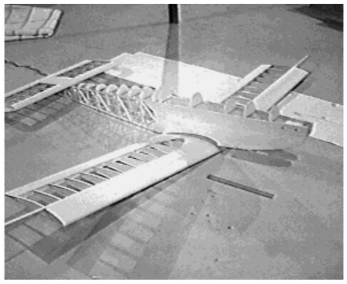
We all had a good time chatting and it was just really nice to get together with the guys.

The following day, I got to wondering how many of us have abandoned RC plane projects, part way through, for various reasons, and whatever happened to them?

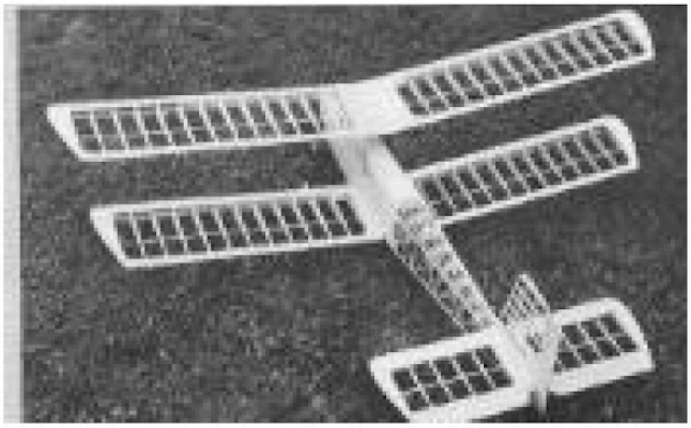
Personally I can thinks of three; a very large, very light biplane based on a plane called the "BIPE LITE" designed by Bob DeMond and presented in the May 1985 *Model Builder*, a "40 size" MiG 3 and a pretty good size B-25. I do know what

happened to all of them. I gave them to my flying buddy and good friend **Richard Utkan**. I was told that he did finish the MiG 3, but I never saw it fly.

Ken's Bipe-E under construction in the Skunk Works. The dark black line on the floor is a 12" ruler. Top wing not shown in the photo. More to come.



My Bipe-E, very similar to the BipeLite, AKA Weight Watcher. The top wing was completed, but not shown in the photo. I'd not yet built/bent up the cabane struts when I gave it away. The photo is from the April 1995 *Ampeer*.
http://theampeer.org/ampeer/ampapr95/ampapr95.pdf



This photo of the Bipe Lite is from the original article.

The Chicken Hawk Conundrum
By Ken Myers

I was having a hard time reconciling Bob Benjamin's numbers from his Chicken Hawk review, in the February 2021 issue of *Model Aviation*, with the Retro RC Chicken Hawks that I seen fly.
Bob's Specifications, p. 45
Flying Weight: 16 oz.
Top Wingspan: 34", **Bottom Wingspan:** 25"
Total Wing Area: 236 sq. in.
Wing Loading: 9.8 oz./sq. ft.

I am extremely fortunate to fly with two AMA Hall of Fame Members on a regular basis. I have seen both **Keith Shaw's** and **Mark Freeland's**, Mr. Retro RC, Chicken Hawks fly. My recollection was that they were a bit more "floaty" than Mr. Benjamin's numbers indicated.

I found Keith's review in the March 2021 *Ampeer*.
http://theampeer.org/ampeer/ampmar21/ampmar21.htm#HAWK

The photo of Keith's Chicken Hawk is from the March 2021, *Ampeer*.

In that issue, Keith notes the flying weight as 12.9 oz.

That weight changes the "numbers" significantly.
Flying Weight: 12.9 oz.
Top Wingspan: 34"
Top Wing Area: 148.8 sq. in.
Bottom Wingspan: 25"
Bottom Wing Area: 87.5 sq. in.
Total Wing Area: 236.3 sq. in.
Top Wing Aspect Ratio: 7.77:1
Wing Area Loading: 7.86 oz./sq. ft.
Wing Cube Loading WCL: 6.14
Stall Speed: 10.37 mph

(*How I derived some of that data regarding the wing areas is in the following article, while the stall speed was previously explained in this issue. KM*)

Those numbers more closely reflect my observations at the flying field over the summer.

The wing loading of Keith's plane puts it into the 7 oz./sq. ft. to 8 oz./sq. ft. range and moved the WCL from the typical sport/trainer range of 7 - 9 and moved it into the Park Flyer range of 5 - 7.

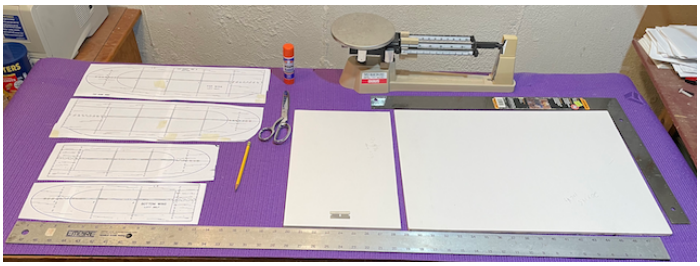
Again, those kind of numbers truly reflect what I observed.

I was satisfied that the numbers were working and the extra 3-ish plus ounces of Bob's version would change the observed flight characteristics, if I ever got to see it fly.

Calculating Oddly Shaped Wing Areas; The Chicken Hawk Used an Example

By Ken Myers

Tools:
wing plan that can be cut up
piece of Elmer's foam board
scale that can measure in grams
Carpenter's square
metal yard or meter stick (I prefer a 48" rule as the edges are thicker for sliding a single edge razor blade along.)
utensil to cut foam board
writing utensil
scissors to cut out the paper wing panels
Elmer's "GOES ON PURPLE DRIES CLEAR" glue stick to attach the wing panels to the foam board for cutting on or
cheap Yoga mat (I use as a cutting mat.)

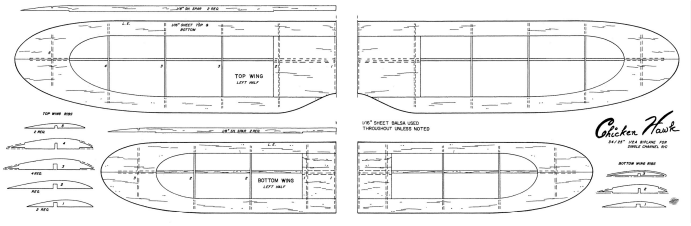


I was not sure about the wing area of Ted Strader's Chicken Hawk biplane.
https://outerzone.co.uk/plan_details.asp?ID=2632

In "NOSTALGIA ISN'T THE ONLY REASON TOO BUILD THIS MODEL - Retro RC Chicken Hawk, p. 43 - 48 of the February 2021 *Model Aviation*, Bob Benjamin, noted the wing area as 236 sq. in. He also noted that the completed model weighed 16 oz. yielding a wing loading as 9.6 oz./ sq. ft. for the Retro RC version of this model, while Keith's came in at 7.86 oz./sq. ft.

http://retrorc.us.com/retroemoth-1-2-2.aspx

The Chicken Hawk wings have nicely rounded tips and the rear of top wing center section trailing edge is curved towards the center line between the wing panels.



I decided that I wanted to check Bob's wing area calculation.

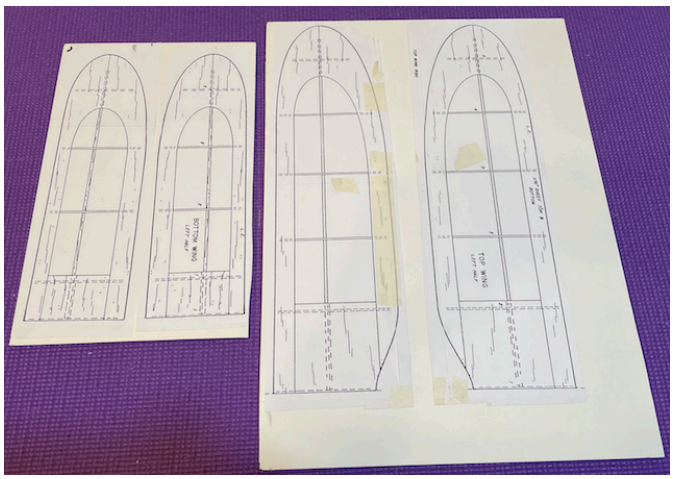
I wanted as close to actual areas as possible, as I was looking at the relationship of the top wing area to the bottom wing area of a biplane for another purpose.

I found a piece of Elmer's foam board that I'd previously cut a chunk out of.

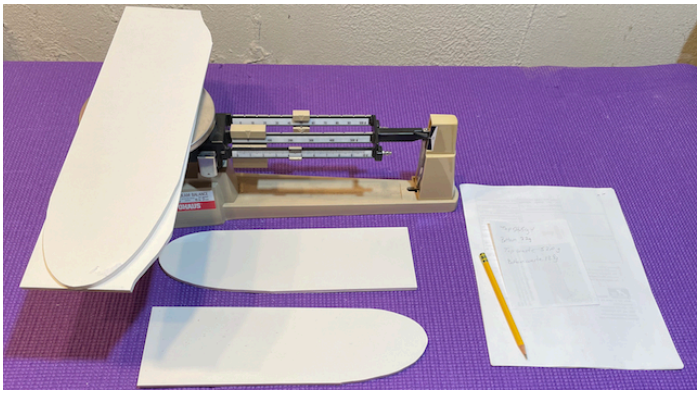
I like Elmer's foam board, for this purpose, because it is heavy, actually too heavy to use for foam board type planes. I was able to cut two pieces from the foam board to fit the wing panels.

Piece 1: 9" x 14.0625" = 126.5625 sq. in.
It weighed 45.8 grams. 45.8g divided by 126.5625 sq. in. = 0.3618765 g/sq. in
Piece 2: 14.5" x 20" = 290 sq. in.
It weighed 106.4 grams. 106.4g divided by 290 sq. in. = 0.3668966 g/sq. in

I averaged the two g/sq. in. weights to use as the basis of the wing area calculation, which is based on weighing the cut out wing panels; the wing panels' weight is divided (/) by 0.3655219 grams to yield the sq. in. of wing area. The cut out wing panels were weighed and then divided by 0.3655219 to yield the wing area in sq. in.



The paper panel templates were glued to the foam board using an Elmer's purple glue stick and then carefully cut out.



The top and bottom wing panels were weighed. The top panels weighed 54.4g.
54.4 divided by 0.3655219 = 148.8 sq. in.

The bottom panels weighed 32g.
32 / 0.3655219 = 87.5 sq. in.

The total wing area was calculated to be 236.3 sq. in., which is perfectly in line with Bob Benjamin's stated value! Great work Bob!

I found what I was looking for.

The lower wing area was 58.5% of the upper wing area and 37% of the total wing area. 58,5% keeps the wing area difference in the biplane category type, which is above the sesquiplane category, that is 50% or less of the top wing area.

All was right with the world once again, I was able to use the percentage for the project that I was working on. ;-)

It's My Problem. It's Your Problem. It's a Browser Problem

By Ken Myers

Wow, I really messed up!

On January 19, 2022, I received an email from **Bob Blau**, a LONG time EFO member.

He told me that he's having a lot of trouble reading the HTML version of the *Ampeer*, and has had the same problem for years.

OMG - oh my goodness, years!

The problem is caused by the way the *Ampeer* is "put together".

First I write the issue in Mac Pages, a word processing program. The PDF is created from that.

Next I hand code the text into HTML using a text editor for the Mac called "BBEdit".

I found that when I copy someone's email or text from the Internet into Pages and then copy that text into BBEdit, some spurious characters will display in the Chrome browser when viewing that page.

Many times those editing mistakes do not always show up in Chrome on the Mac, but they do in the Windows version of Chrome.

For the HTML version, I have to hand code things like links, quotes, apostrophes, bold, italics, underline, superscript and subscript. etc.

A few years ago, I became aware of the problem with the compatibility of the Chrome browser on the Mac and Windows, so, when I've been proofing the HTML version, I've set my wife's Window's laptop next to my Mac and caught what I thought were all of the problems. WRONG!!!

Bob uses the Mac's built-in browser called Safari. Thanks to Bob's email, I just learned that the Safari version still displays a lot of characters that neither version of Chrome did. Head slap.

I apologize to those of you that have been having problems do to my poor coding, I just wish that any of you having problems viewing the HTML version would have, and will, let me know about it.

At this time, I am going backwards, starting from January 2022 and "cleaning up" my coding errors and reposting the file so that at least the most recent versions do not have so many conspicuous errors.

I am very sorry about that folks!

The March 1989 Version of the *Ampeer*

By Ken Myers

Usually, in the March issue of the *Ampeer*, I note that **issue one** of the *Ampeer*, March 1988, known as the W.O.L.F.'s Call, is celebrating its "birthday".
http://theampeer.org/ampeer/ampmar88/ampmar88.htm

Since I noted that in the February 2022 *Ampeer*, in the article titled "The Complete Ampeer Index", I'd like to take a look back again.
http://theampeer.org/ampeer/Complete-Ampeer-Index.html

To see how much the club and newsletter grew in one year, take a look at the March 1989 issue.
http://theampeer.org/ampeer/ampmar89/ampmar89.htm

Because there was no computer version available, as I was using an Apple II GS at the time,

the printed version master was scanned to provide this copy.

By that time, mailed versions of the *Ampeer* were reaching many states, including Alaska.

There is a lot of "interesting" stuff in this issue, including how to break-in brushed motors.

The header "block" was developed that would be used for many years to come.

There were also two cartoons in this issue, and they would become a staple in each issue for many years.

A Curious Coincidence

By Ken Myers

For many years I have discussed the concept of using wing cube loading (WCL) to compare the "flyability" of different and similar types of model aircraft.

http://theampeer.org/CWL/myers2018.htm

I have noted before that the WCL value is unit-less, but why is it unit-less when wing area loading is not?

Wing area loading is based on mass, but those of us who "think" in Imperial units, often "call it" weight, divided by some type of square units of wing area, depending on whether we "think" in Imperial units or SI units.

Many model aviation Imperial "thinkers" think of wing area as the ready to fly "weight" in ounces (oz.) per wing area in square feet (sq. ft. or ft^2).
Example: RTF weight 50 oz. and wing area 500 sq. in. To achieve the desired value of sq. ft., the wing area in sq. in, needs to be changed to sq. ft. There are 144 sq. in. in a square foot. 500 sq. in. divided by 144 sq. in. = 3.472 sq. ft. (rounded). The word per, in this mathematical instance, means divided by.
50 oz. / 3.472 sq. ft. gives a wing area loading of 14.4 oz. / (per) sq. ft.

On the other hand, usually, when talking about full scale aircraft, the "weight" is stated in pounds and the results are are in pounds per square foot.

Many model aviation SI "thinkers" think of wing area as the ready to fly mass in grams (g) per wing area in square decimeters (dm^2).
Example: RTF mass 1417.48 g and wing area 32.258 dm^2. At times, the mass may be noted in kilograms (kg), and then the mass needs to be divided by 1000 to yield the mass in grams, as there are 1000 grams in a kilogram.
1417.48 g / 32.258 dm^2 gives a wing area loading of 43.9 g / dm^2

Imperial "thinkers" might comprehend the notation 14.4 oz. / sq. ft. while SI "thinkers" might comprehend 43.9 g / dm^2.

In case you did notice, both of the calculations use the same mass (weight) and wing area. The units are just expressed differently.

What is the POINT, Ken?!?

It is fairly obvious that "thinking" in one unit and then trying to "switch that thinking" to another's units of "thinking" is extremely hard as nothing seems to "jive", but …

One form of the wing cube loading formula is that the mass ("weight") is divided by the cubed value of the wing area.

Wing area is stated in square units; To assign it a cubed value, the area's square root needs to be determined and then multiplied by that result three times to create a cubic value.

Remember that 500 sq. in. is 3.4722222 sq. ft.

The square root of 3.4722222 sq. ft. is 1.86339 ft.
1.86339 ft. times 1.86339 ft. times 1.86339 ft. equals 6.47 cubic feet. (rounded)
or alternately
3.4722222 sq. ft. raised to the 1.5 = 6.47 cu. ft. (rounded)

In Imperial units the WCL for the 50 oz. 500 sq. in. plane would be:
50 oz. / 6.47 cu. ft. = **7.73** oz. / cu. ft

Hang in there. This is where it gets interesting.

The units used to create the SI wing cube loading are kilograms (kg) and meters squared (m^2).

Using the previous example, the mass of 1417.48 g is converted to 1.41748 kg by dividing by 1000 and the 32.258 dm^2 is converted to m^2 by dividing by 100, which yields 0.32258 m^2.
1.41748 kg / 0.32258 m^2 raised to the 1.5 power is
1.41748 kg / 0.1832129 cu^3 = **7.77** kg/cu^3

Note that the value of **7.73** oz. / cu. ft^3 is very close to the value of **7.77** kg/cu^3. The two values are within 1/2 of 1% or each other.

For me, that is close enough to call them "the same".

In other words, when a person using one type of unit measuring system tells a person using the other type of unit measuring system the WCL value, both can understand that particular parameter and it ramifications on the model's flight characteristics

with no conversions necessary. That is why WCL is usually presented with no unit descriptor.

Is There Another Unit Less Parameter That Is Shared Between the Two Different Measuring System?

The aspect radio (AR) is the relationship of the wing's length to its chord.

The formula for the AR is wingspan squared divided by the wing area.

If the example plane, used throughout this article, had a wingspan of 50" then the AR would be 50 inches^2 / 500 sq. in. = 2500 in^2 / 500 in^2 = 5, which means that the AR is the ratio of 5 to 1, written 5:1.

also

50" / 12" in a foot = 4.1666667 ft. and 500 sq. in. / 144 sq. in. = 3.4722222 sq. ft.

4.1666667 squared = 17.361111 / 3.4722222 = 5

SI units

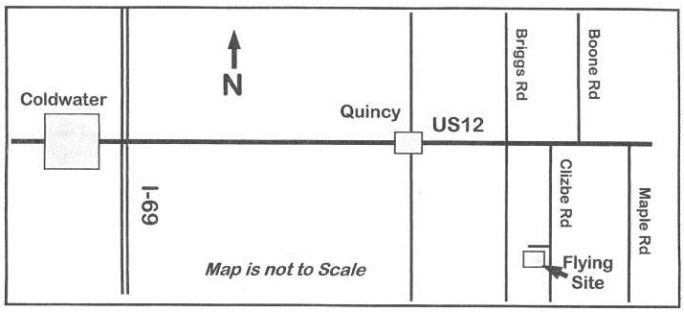
50" / 39.37 the number of inches in a meter = 1.27 meters

1.27^2 = 1.6129 m^2 / 0.32258 m^2 = 5

Therefore the AR ratio is also unit-less.

Without having to do any conversions, modelers using either one of the measuring systems can communicate two of the model's parameters.

Could there possibly be more?



The Upcoming Keith Shaw Birthday Party Electric Fly-in 2022

The Balsa Butchers are hosting the "Keith Shaw Birthday Party Electric Fly-In", for the 20th year, at their field near Coldwater, MI. The event takes place on Saturday, **June 4, 2022**. It is a one day event again this year.

The event consists of Open Electric Flying with a "Special Guest of Honor Theme", Happy Birthday Keith Shaw [June 6].

Enjoy a day with the "Pioneering Master of Electric R/C Flight". 8 a.m. - 4 p.m., Saturday. NO LANDING FEE! Donations for field maintenance and lunch appreciated.

For additional information contact; Contest Director: Dave Grife - E-mail: grifesd@yahoo.com or Phone: 517-279-8445 Please e-mail or call with any questions.

The field will be open for guests to fly on Sunday as well.

Skymasters Indoor Flying 2022

From Pete Foss, Skymasters' President

Indoor Flying - **Wednesdays**, at the UWM Sports Complex, 837 South Blvd, Pontiac, MI
Time: 10:00 AM
Field #4 (Park and Enter on the north "back" end of the complex)
View Event PDF Flyer.
http://www.skymasters.org/index.php?page=events&flyer=data/flyers/2021/2021_indoor_full_pg_color_flyer.png
View Event Map.
http://www.skymasters.org/index.php?page=information&type=wherewefly&item=ultimate#ultimate

Contact: **Fred Engleman** Phone: (248) 770-3239
Email: indoorfly@skymasters.org

Updated Information

Park a little closer, when UWM Training Sessions let out at 10 and the parking lot empties out quickly making more room for us closer to entrance of Field #4.

(NOTE: there is no longer an ATM machine in the building, so you will need to bring the proper change/ cash only).

Each Pilot/Driver and Spectator is required to sign a onetime Release Form Liability Form.

With a ceiling height of 75 feet pilots do not have luxury of flying 3 mistakes high. We are also surrounded by 4 walls, fellow pilots and spectators all around. The utmost care must be taken when flying at all times. Pilots flying the faster delta wing planes must give way to slower planes. That said, if you are flying a slower plane, you may want to land when faster planes are in the air. Batteries only last a short time and you can return to the air to fly without costly mishaps. Everyone wants to have a good time and return home with our planes intact.

A quick reminder, **if you are charging batteries the batteries must be in or on a fire retardant surface like a LiPo sack**. **No charged or discharged batteries may be left at UWMSC.**

Upcoming E-vents

Both On Wednesdays:
Indoor Flying from 10 a.m., Pontiac, MI (details in this issue)

Indoor Flying from 12:30 p.m., Brighton, MI (details in this issue)

March 9, Wednesday, 7:30 p.m. on Zoom, EFO monthly meeting.

Toledo Swap Shop, April 1 - 2, 2022 (more details to follow)

Indoor Flying at the Legacy Center in Brighton, MI

Indoor flying takes place from November 3rd, 2021 until March 30th, 2022 at the Legacy Center Sports Complex, 9299 Goble Dr., Brighton, MI 48116, phone: 810.231.9288, on Wednesdays from 12:30 PM until 2:30 PM.

The cost is $10 per drop-in session.

June 4, 2022, Saturday, Keith Shaw Birthday Celebration Fly-in, (details in this issue)

July 9 & 10, Saturday and Sunday, 38th Annual Mid-America Electric Flies (the Mid-Am), more details to follow soon.

The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390
http://www.theampeer.org

March Monthly Meeting:
Date: Wed., March 9, 2022 **Time**: 7:30 p.m.
Place: ZOOM