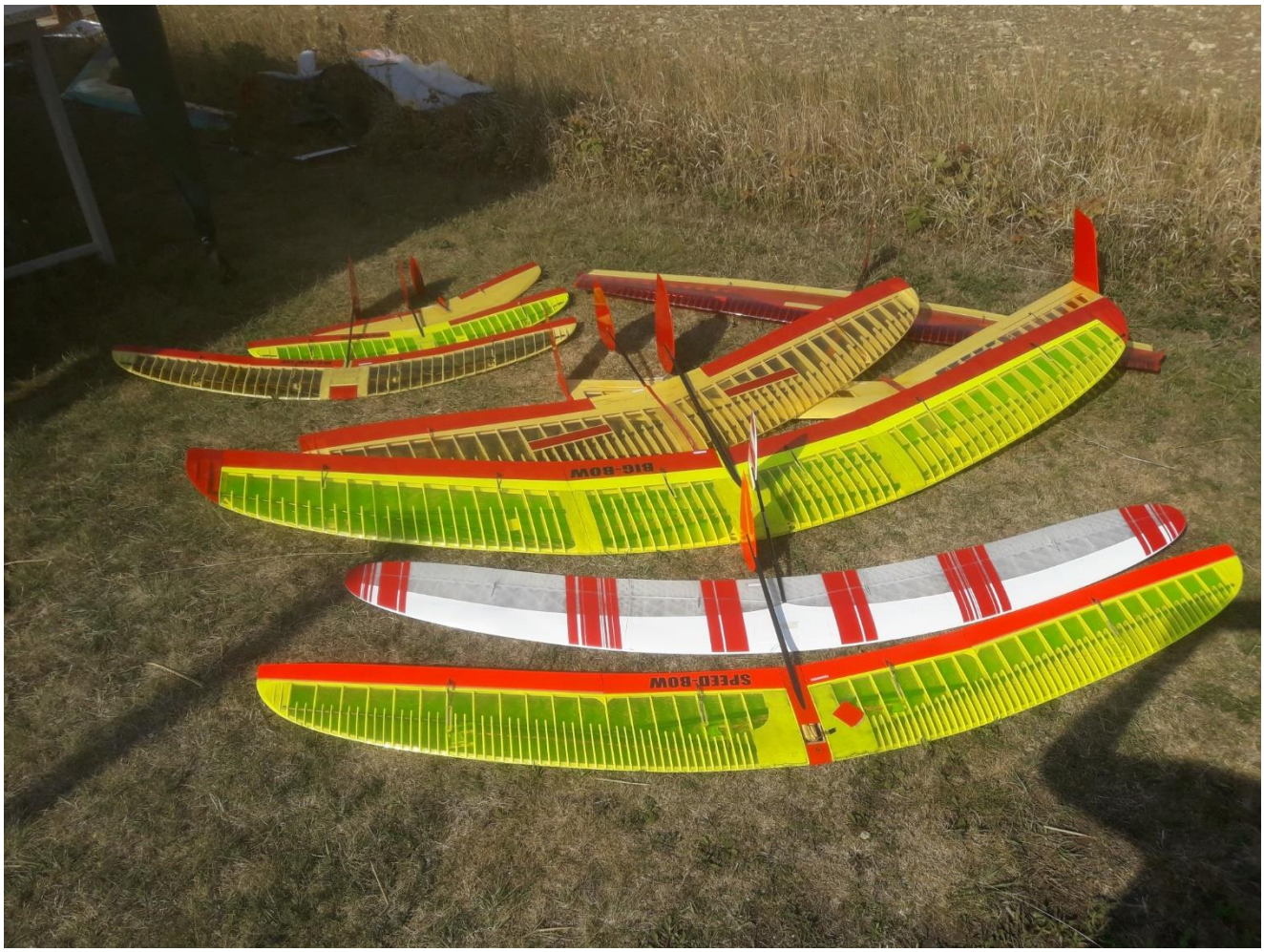
Guideline:
How to setup the BOWs optimally



Who can find the open-wing on the photo? 😊

www.bow-wings.pro

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Creator	David Stockmayr (david@bow-wings.pro))
Version	1.2
Date	24.01.2023
Distributor	All BOW interested and pilots 😊
Translation	Thanks to DeepL

MAD(E) in AUSTRIA

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1 Introduction

After the assembling of the Bow the setup is also important to achieve the desired flight performance (as seen in Franz's videos, for example).

Because the bows not only look extraordinary (good), but they also have the potential (with the proper setup) to fly really fantastic.

With these guidelines Franz Heindler (the Mastermind behind the Bows-Family) gives us a "BEST-OF" of his years of experience in handling and setting up model gliders, here in particular with the popular BOWs.

2 Setting up the BOW optimally

The following success factors must be considered:

1. proper servos + linkage
2. right position of the CoG and CoG setup
3. Set the rudder-deflections correctly

BTW: “Rudder” is here a synonym for flaps, elevons…

Due to the importance of **all success factors**, you should allow sufficient time for them.

Anyone who works conscientiously and accurately at this point will be rewarded at the end of the day with an unusually well-flying BOW. 😊

The whole procedure is no rocket science and is certainly not all NEW to you.

It is simply the summary of important final work, which differs in places from the final work "normal" model gliders.

2.1 right servos + linkage

right servos:

One of the most frequently asked questions is whether there are "other" (= cheaper) servos than the recommended (KST) servos.

We are aware that e.g. the 6 pcs. KST servos for the BigBow cost as much as the kit itself.

We tried many other servo-brands and always ended up with KSTs (and no, we are not sponsored by KST...).

Many BOW pilots who relied on other servo types were sooner or later frustrated.

At the end of the day, what everyone puts in their BOW is and remains their decision. We continue to make recommendations, which in our view is the best choice for the respective Bow.

Linkage:

Important: BEFORE INSTALLING the servos, please adjust the servo arms together (servo arms have the same (zero) position in the transmitter lever center position and move synchronously).

The easiest way to do this is to place the servos "lever to lever" and the servo arms (pics)

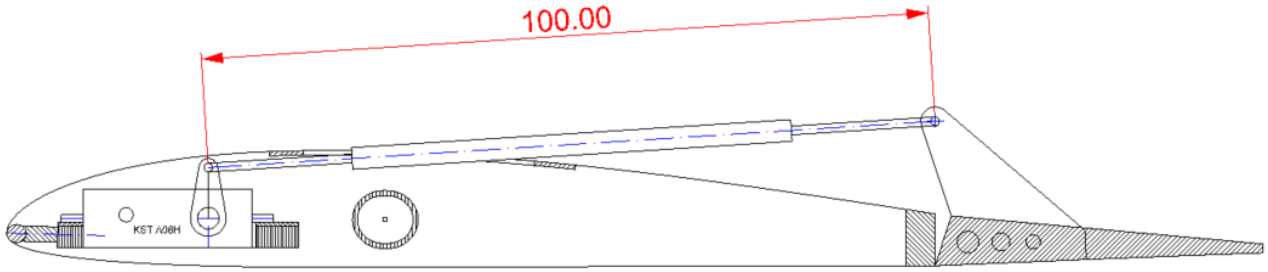
1. Rough center adjustment: servo arm on the gear
2. Fine center adjustment: with the transmitter.

Zero position: (symbol image)

YES	NO
	

Sorry for the JX-Servos, all my KST-Servos are in my planes 😉

To avoid kinematic errors (=different deflections of left rudder to right rudder), the linkages must be of equal length in pairs (left and right). (between the servo arms and the rudder lift see picture e.g. 100mm).



Inaccuracies in the length of the linkage rods can then only be compensated for by programming at the transmitter, which is usually at the expense of the overall travel.

2.2 The right position of the Center of gravity (CoG)

The following, 2-stage scheme has proven itself in practice: (not only for the BOWs 😊)

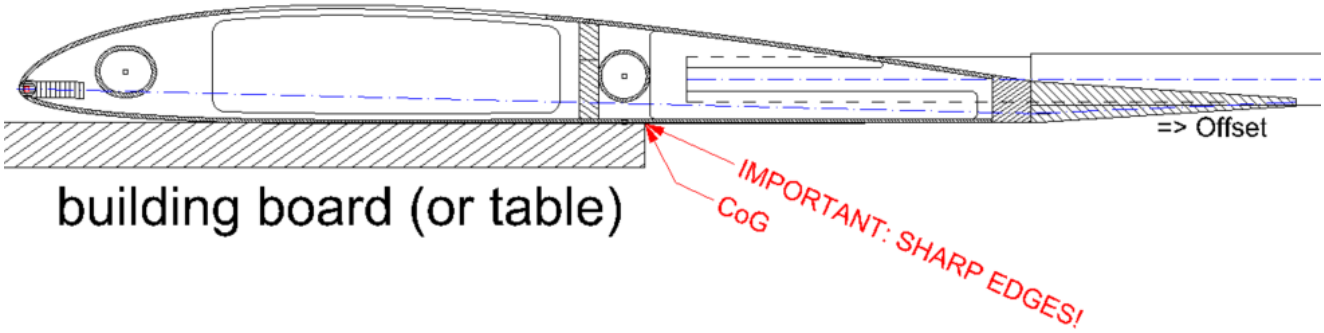
1. Setting up CoG in the workshop
2. Fine tuning of the CoG in the air

1.) Setup the CoG in the workshop

	Please do NOT set up the center of gravity of the BOW with your fingertips. This is much too inaccurate and will NOT lead to the desired results!

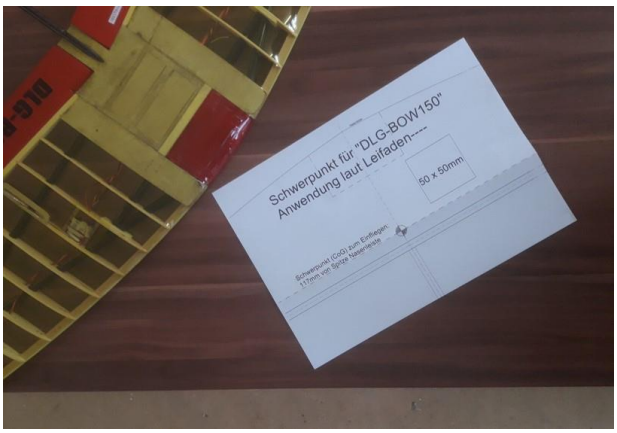
However, we don't need expensive electronic center of gravity scales either.
The SIMPLE_ABER_EFFECTIVE METHOD everyone has at home:

A building board (or table) with sharp edges



Procedure:

1. Cut out the template "center of gravity" from the construction plan (if not available, please request the drawing as PDF via mail from David).



2. Align the dash-dotted line (CoG) exactly with the edge of the building board and fix the drawing in this position to the building board with adhesive tape.

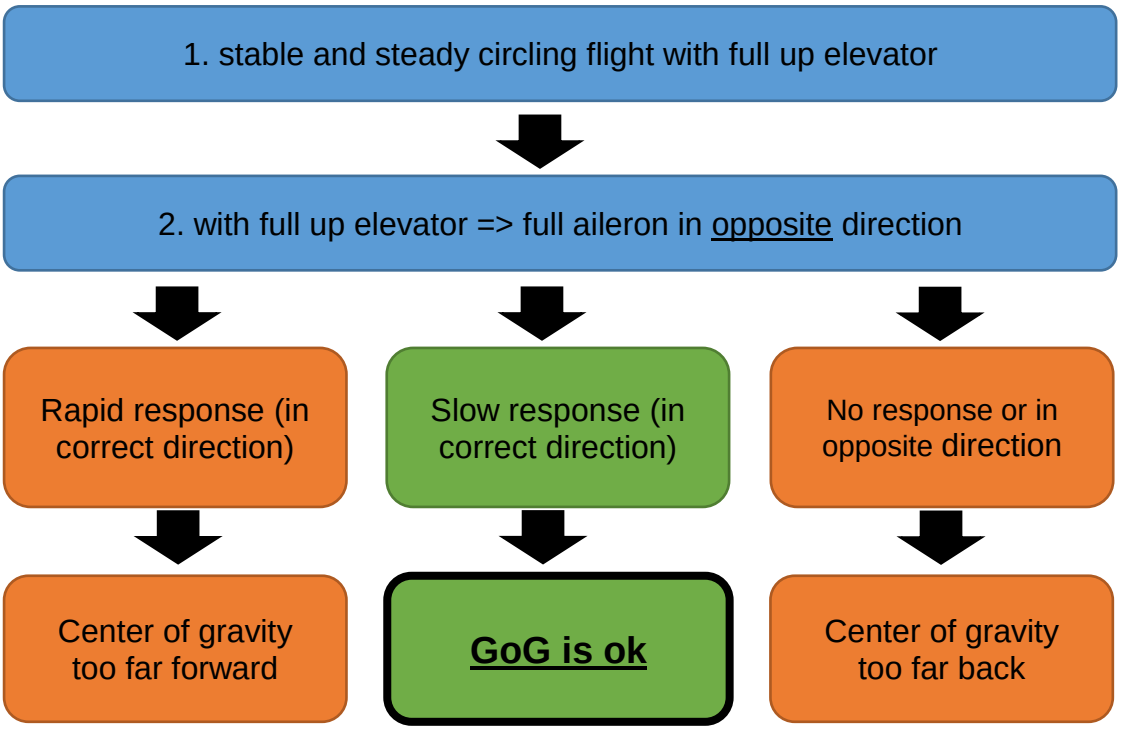
3. Place the wing on the building board and align the leading edge according to the drawing

4. Adjust the CoG (put lead in/out, or move battery) until the bow <u>just stops tilting backwards....</u>

2.) Finetuning of the CoG in the air

Please be sure to try this Test for **ALL FLIGHT** Modes....

As with the RES DART, the following test-procedure has proven effective for checking the optimal center of gravity position:



Depending on the weather conditions and the desired response speed, the wings can thus be quickly checked for a sensible center of gravity position close to the performance maximum.

2.3 Rudder deflections

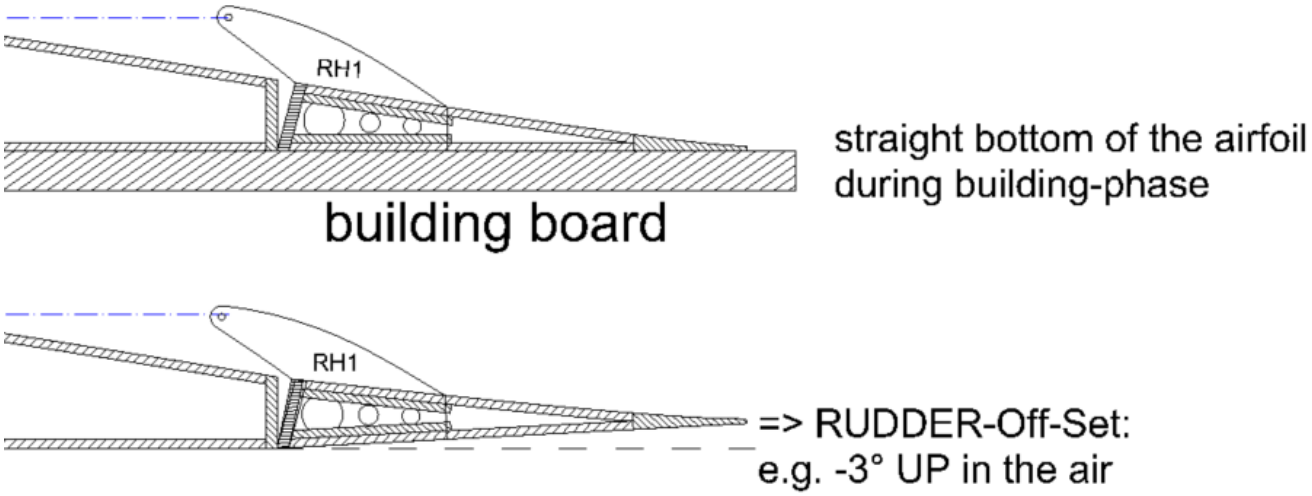
2.3.1 Preparation

Ideally, the servos should be adjusted and synchronized before they are installed in the wing.

If you do not do this, it can be very difficult to achieve the specified rudder deflections.

2.3.2 Setting up the rudder deflection

The trailing-edge/rudder are slightly raised up for flying (="off-set"), this sets the S-shape of the airfoil.



This gives the bow the required stability around the lateral axis. In a “normal” airplane, this task is performed by the elevator.

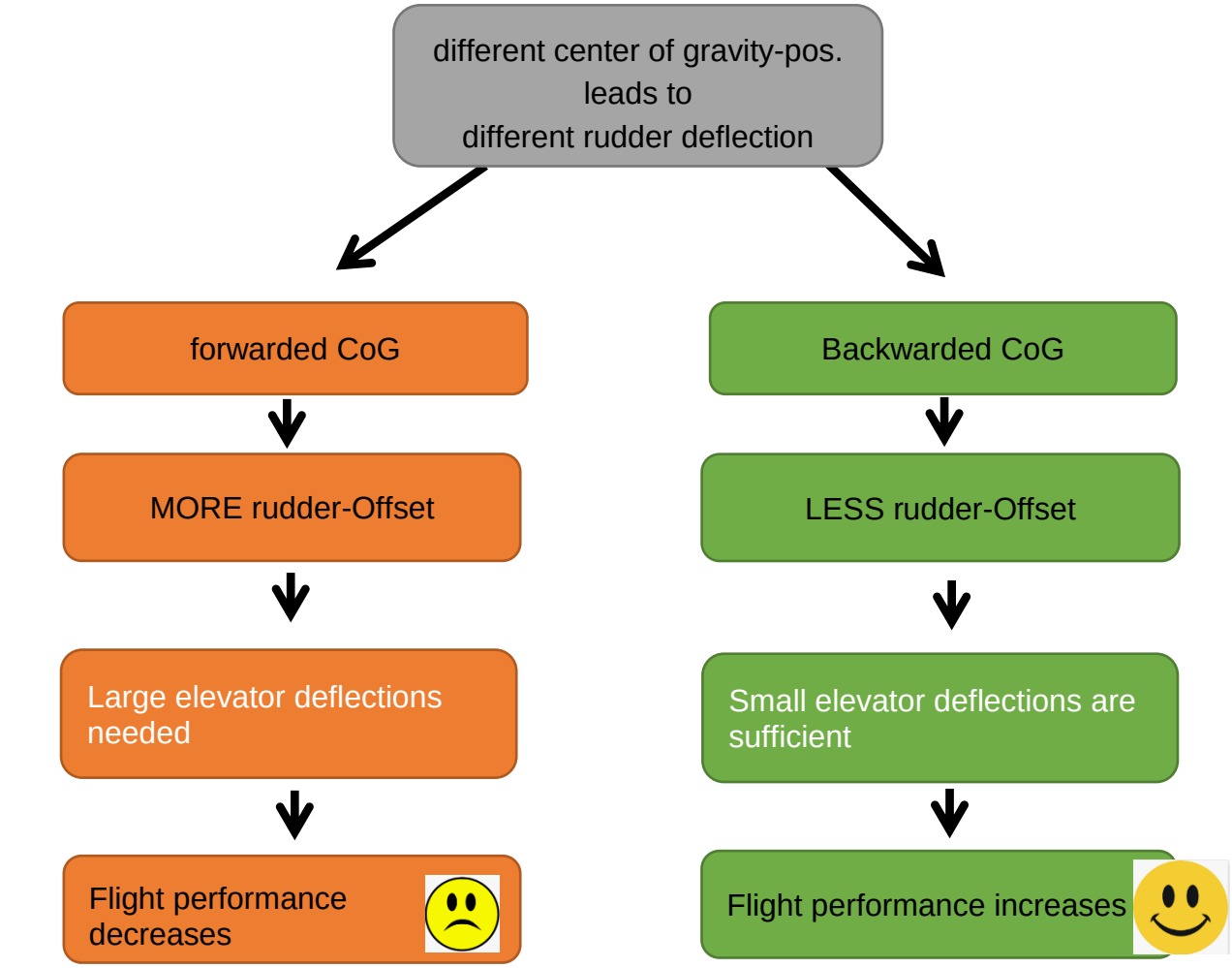
The goal with bows is to put up the rudder as little as possible.

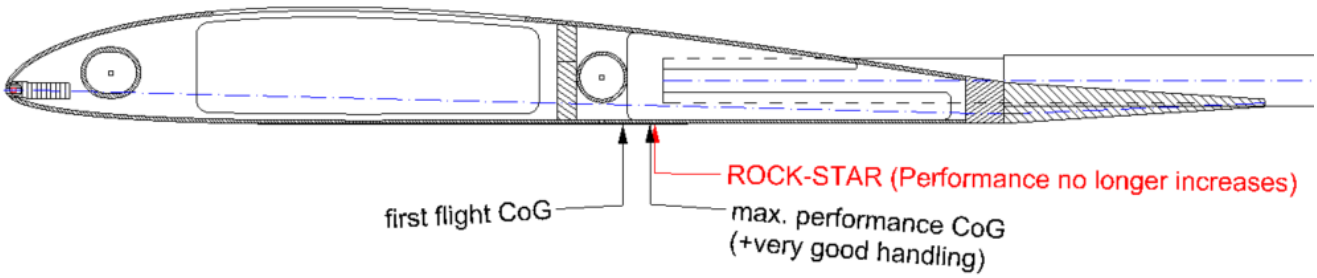
In simplified terms, this means:

small rudder deflection = more flight performance

(The wing profiles are less de-cambered).

The position of **center of gravity** and the **rudder deflection** are related to each other, which means:





- Please always start with the “first-flight” CoG (+ the recommended rudder deflections)
- In the air, gradually move the CoG further **back** by removing the lead until the CoG of maximum flight performance is reached (= rearmost CoG flown by Franz) + adjust the rudder offset (in a tenth of a millimetre- range!).

  At the same time, the maximum elevator deflection is also reduced because the response to elevator deflections increases when the center of gravity is further back.
- At the ROCK-STAR-position, the performance no longer increases and the handling in the air becomes much more unpleasant.

For the **first flight,** PLEASE start with the rudder settings from the build thread or assembly instructions or build plan.

Please check the rudder-deflections according to the instructions:

- Move elevons full to the LEFT, move elevator from full up to full down => There should be no **dead travel/band** on the elevator stick.

- Move elevons full to the RIGHT, move elevator from full up to full down => There should be no **dead travel/band** on the elevator stick.

- Move elevons full left, when switching through the flight modes the upper and lower end position of the rudders must remain the same.

- Move elevons full right, when switching through the flight modes the upper and lower end position of the rudders must remain the same.

What is it about the dead travel/band?

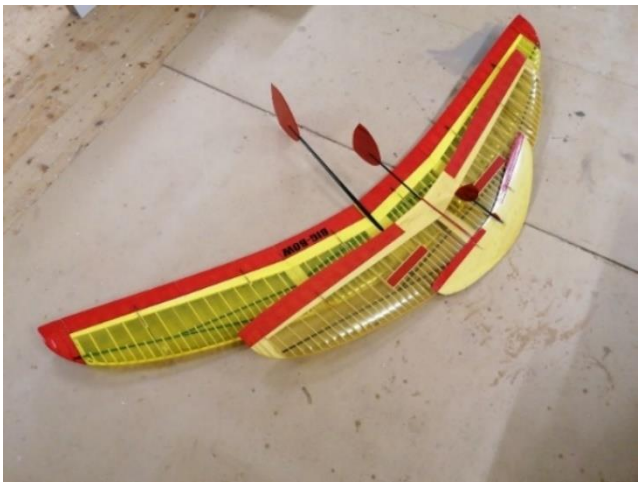
The servo can no longer move the rudder beyond a certain stick position.
The remaining stick travel no longer results in an increase in rudder deflection.

If the control surfaces do not move to the maximum stick travel, it will be almost impossible to fly e.g. clean rolls.
During inverted flights the wing will then either break out (when pressing the HR) or goes down.

3 "Historical": The BOW family

With his innovative model ideas, **Franz Heindler ensures** that the success story of the BOW family continues.

Here are some examples: for more details see the descriptions below



Do you even know all the other BOWs yet?
NO? => then it is certainly worth reading on!

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