Bronze Endorsement: Aircraft General Knowledge & Systems

Craig Lowrie

Topics Covered

- The Design Rules – CS22
- Construction Materials & how each performs
- How we measure performance and how we improve it
- How gliders are constructed & what the key parts are for
- Flight Envelope and consequences of going outside it
- How gliders are controlled and the side-effects
- How they are designed for better flying characteristics
- Key Instrumentation types and how they work
- Undercarriage systems & considerations
- Electrical systems
- Ancilliary systems
- Historical & Emerging Navigation & Conspicuity gadgets
- Paperwork / Permissions and Controls

The Sailplane Design Rules

CS22 (175 Pages !)

BOOK 1 – AIRWORTHINESS CODE

Design Rules

- SUBPART A — GENERAL
- SUBPART B — FLIGHT
- SUBPART C — STRUCTURE
- SUBPART D — DESIGN AND CONSTRUCTION
- SUBPART E — POWER-PLANT
- SUBPART F — EQUIPMENT
- SUBPART G — OPERATING LIMITATIONS AND INFORMATION
- SUBPART H — ENGINES
- SUBPART J — PROPELLERS

BOOK 2 – ACCEPTABLE MEANS OF COMPLIANCE (AMC):

How to Prove it

- SUBPART A — GENERAL
- SUBPART B — FLIGHT
- SUBPART C — STRUCTURE
- SUBPART D — DESIGN AND CONSTRUCTION
- SUBPART E — POWER-PLANT
- SUBPART F — EQUIPMENT
- SUBPART G — OPERATING LIMITATIONS AND INFORMATION
- SUBPART H — ENGINES
- SUBPART J — PROPELLERS

EASA / CAA

DESIGN / DEVELOP/TEST

Glider Manufacturers

DG Flugzeugbau

SCHEMPP-HIRTH

HpH sailplanes UK

www.hphUK.co.uk

IE : DG

CERTIFICATION

TCDS


EASA

TYPE-CERTIFICATE

DATA SHEET

NO. EASA.A.095

for

LS Sailplanes

Type Certificate Holder

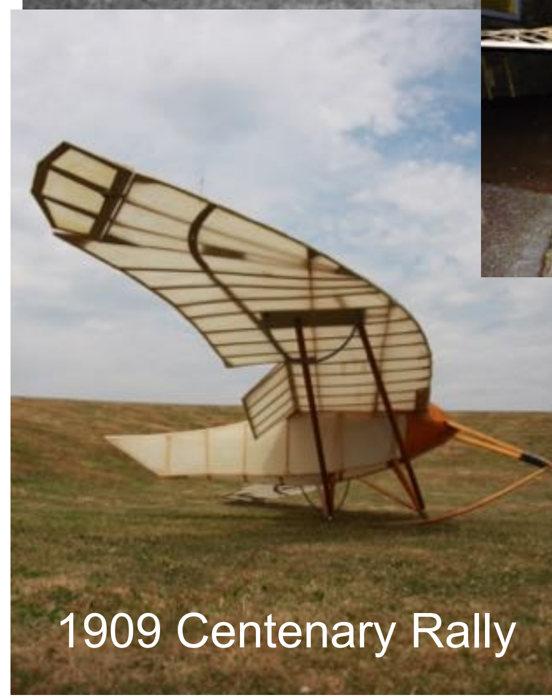
DG-Flugzeugbau

EASA/CAA/ie : DG

Advances in Construction - Wood

- Wood was typically used on early gliders
- The structures are complex and use lots of small pieces of wood to achieve a strong yet light structure
- The structure is covered with fabric… originally cotton but now ‘ceconite’ is usually used
- Wood gliders are *manpower intensive* to make and some glues fail with dampness


Jose Weiss Glider


1909 Centenary Rally


It Flew !

Advances in Construction
Wood / Steel tube

- Steel Tube replaced wood for fuselage
- Structure could be 'Jig' Built simplifying construction time
- Structure was light and strong
- Was suspectable to bending following firm landings and did not provide much protection
- Was prone to corrosion in areas near the landing gear

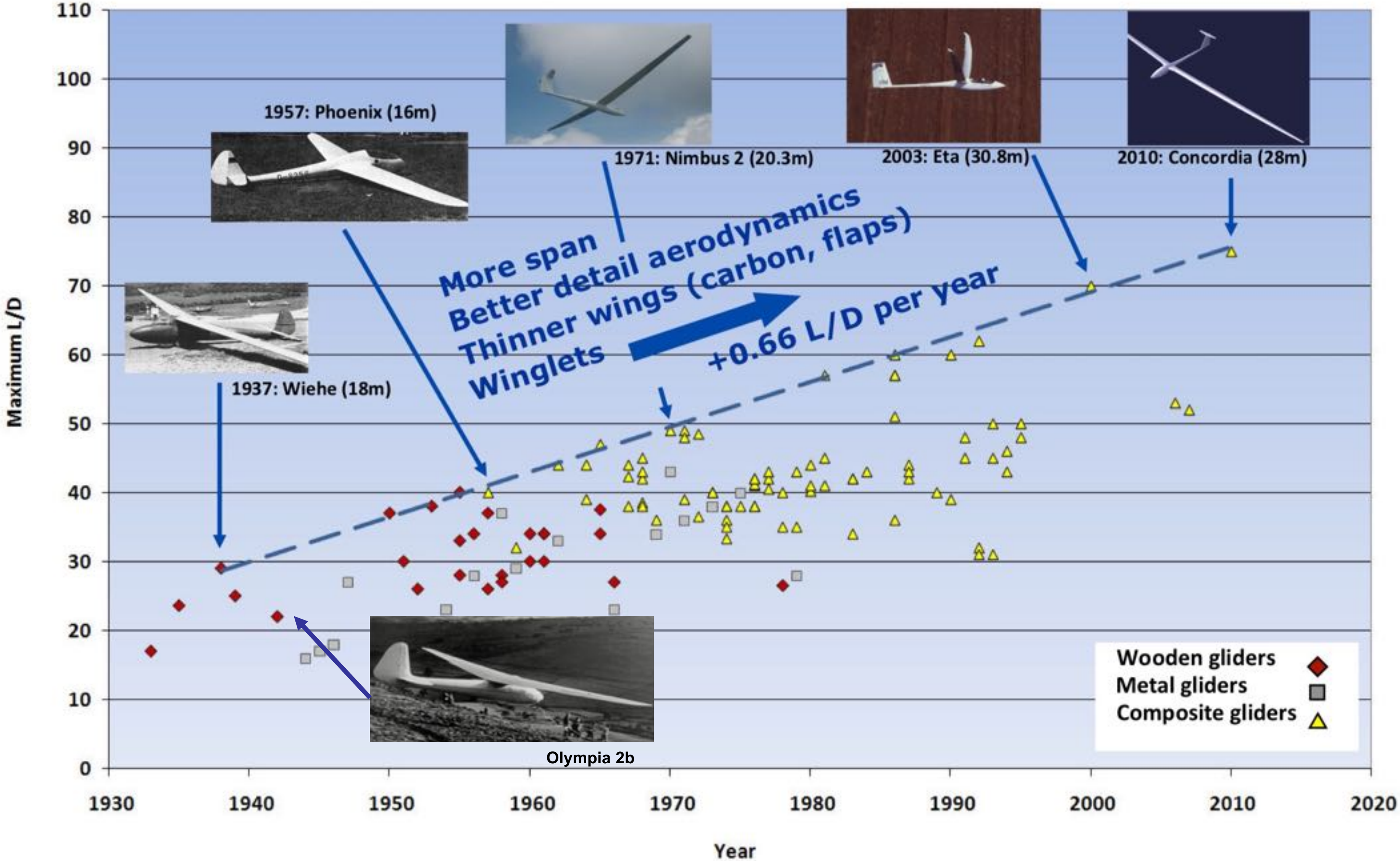
Advances in Construction - Metal

- Metal looked like the ideal material in the 70's / 80's
  - Very Strong yet light
  - Could be left outdoors all year round
- Various issued emerged such that it is not used for gliders anymore
  - Fatigue problems which were sometimes difficult to detect and resulted in structural failure
  - Some corrosion issues in key areas
  - Thin skins easily damaged
  - Wing profiles did not meet increasingly stringent requirements
  - Needed specialist repair
- Metal is rarely used today

Advances in Construction - Composite

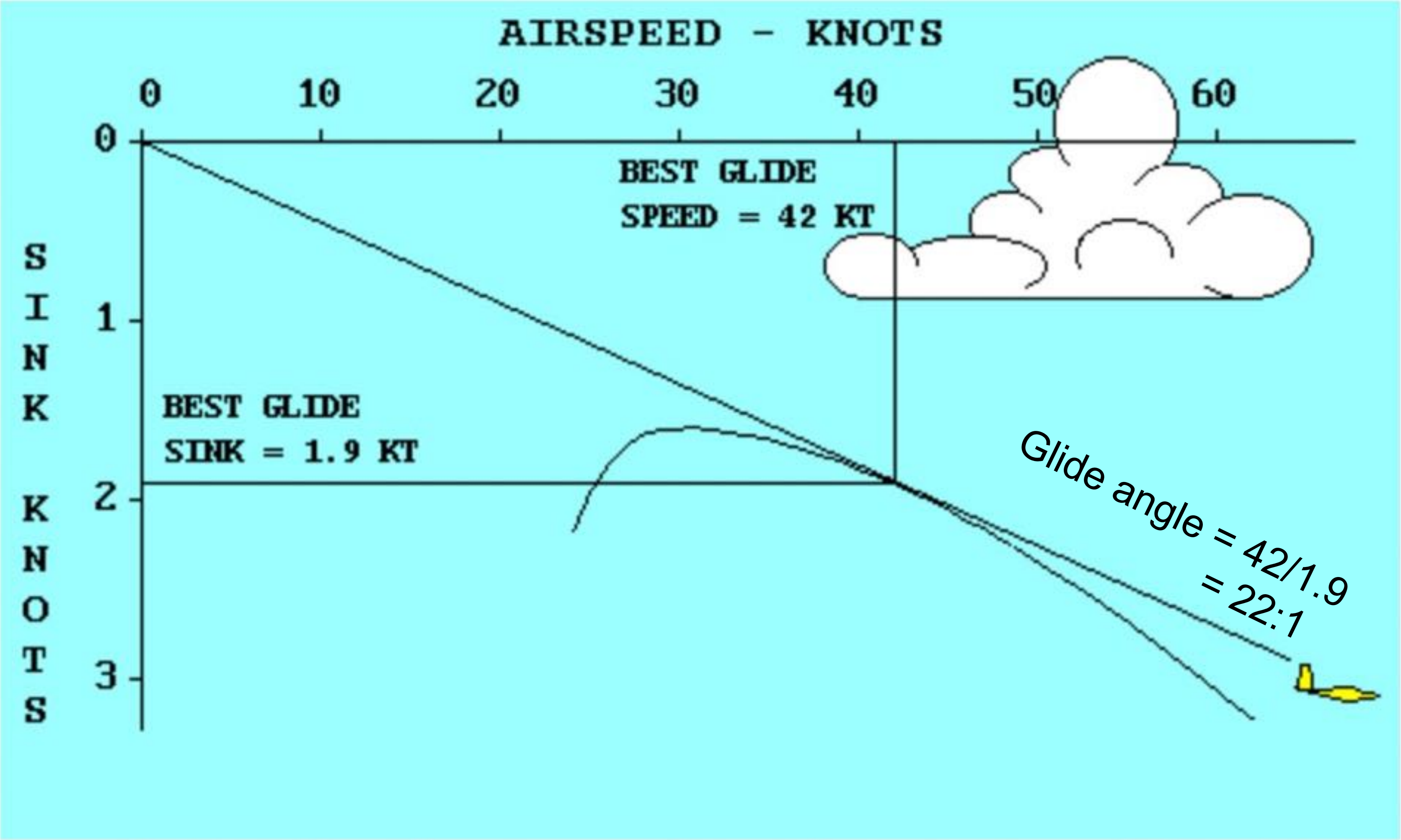
- Composites were perfectly matched to new and emerging requirements
  - Allowed easy creation of smooth streamlined shapes
  - Were strong yet relatively light
  - Engineering development provided new materials like Carbon Fiber and Kevlar which could be used selectively for better properties
  - No component fatigue detected following repeat tests, years apart
  - Has allowed the creation of new and ultra thin 'low-drag' wing profiles and slender tailbooms to reduce form drag
- Downsides…???... Are there any..?
  - Finish deterioration…?

And the Results…



Glide Angle & Polar Curve

Oly 2b

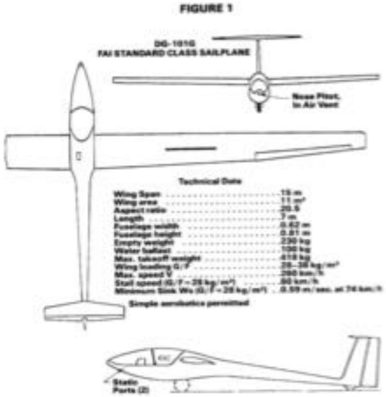


Measuring the Performance on a real glider
Pioneered by Dick Johnson

A FLIGHT TEST EVALUATION OF THE DG-101G
By Richard H. Johnson, Published in *Soaring* Magazine, 5/85

Glaser-Dirks Flugzeugbau GmbH is a relatively new West German sailplane manufacturing firm that is both designing and building an increasingly large array of fine new sailplanes. The DG-101G design evolved from an earlier DG-100 model, and both are 15-meter span fiberglass Standard Class designs. Figure 1 presents a 3-view of the current DG-101G model, along with its factory-provided technical data.

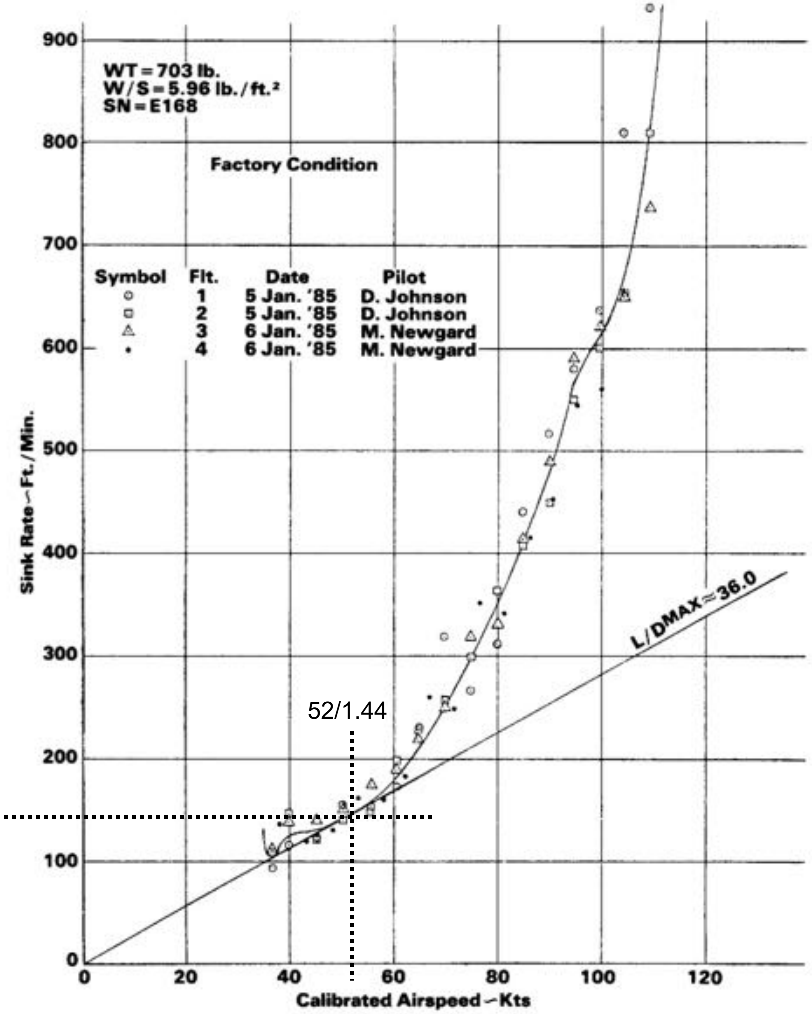
Wilhelm Dirks is the talented principal designer of all of the popular DG line, which now includes the -200 (15 Meter), -300 (advanced Standard Class) and -400 (self launching) series of modern sailplanes. A DG-500 two-place model is now in development. Some of these models are manufactured in Yugoslavia at the Elan associate factory, as was our serial no. E168 test sailplane. They provide a fine sailplane at a most reasonable cost of about $12,000 plus instruments, options, trailer and shipping.



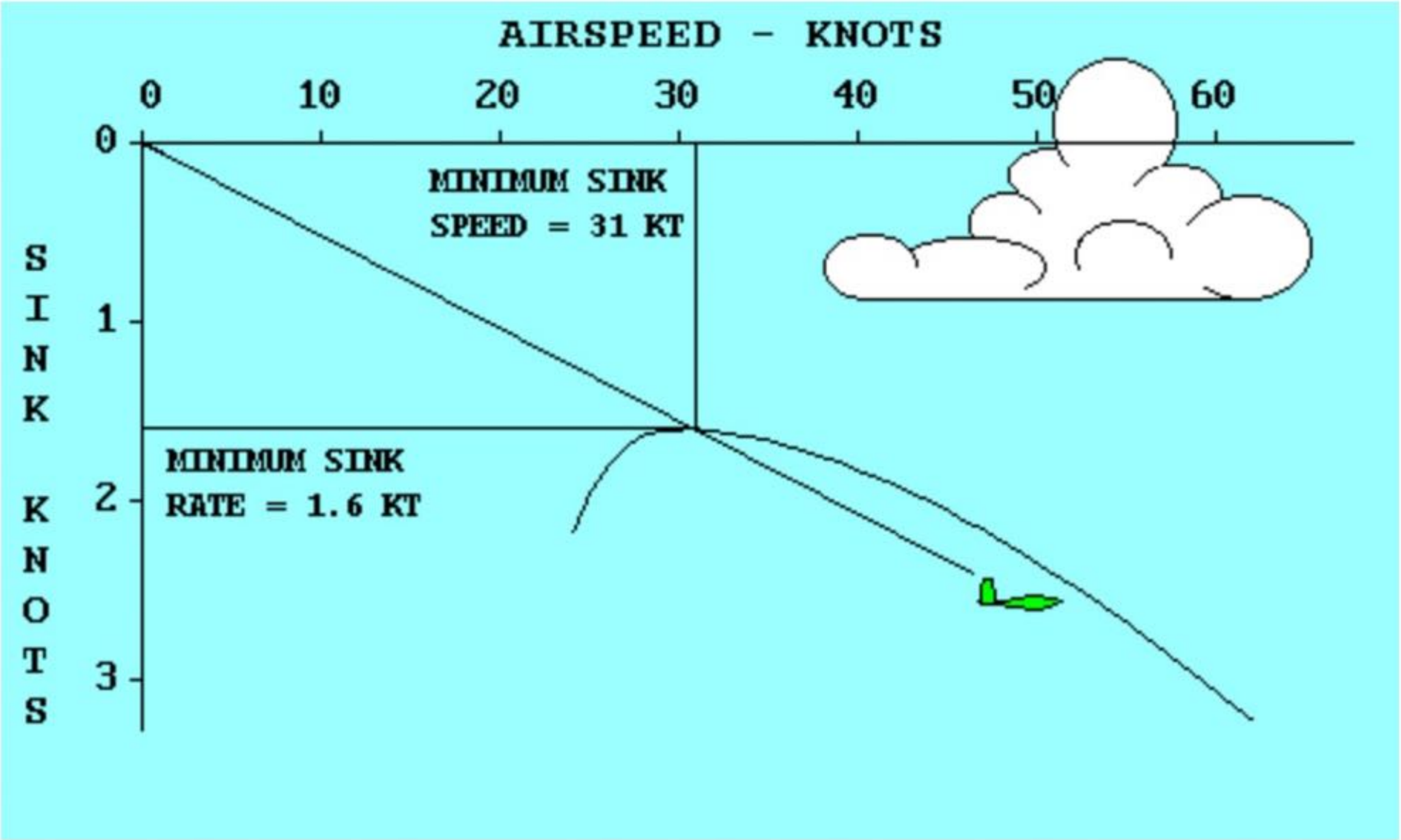
Albert Lang of Richardson, Texas has wanted to own a modern fiberglass sailplane for himself and his son to fly at Caddo Mills and the DG-101G appeared to be a good choice. He kindly loaned it to the DGA, even before flying it himself, and we performed seven high-tow test flights in still winter air to obtain its performance polar, airspeed calibration and wing drag probe data. Its sink rate was tested during the first four test flights and the data are shown in Figure 2. A very good 36:1 L/Dmax is indicated at 52 kts. I performed the first three test flights, and Mike Newgard (who weighs about 60 lbs. more than I do) performed the fourth test flight. The data from Mike's Flight 4 were corrected to my 703-lb. gross weight by the square root of the weight ratio factor method.

Since my 155 lb. plus 17 lb. parachute weight was near the 165 lb. (75 kg) minimum cockpit loading, my test data were taken with the center-of-gravity near the DG-IO1G's aft limit. Our test sailplane's empty cg was .71 in. (18 mm) forward of its aft limit, with a total allowable empty cg range of 4.25 in. (108 mm). On the other hand, Mike's 215 lbs. plus parachute brought his cockpit load to about 20 lbs. less than the max permitted 257 lbs. (117 kg). This cockpit loading for Flight 4 moved the sailplane cg to near forward limit and that made a good test of cg location effect on performance. Note that

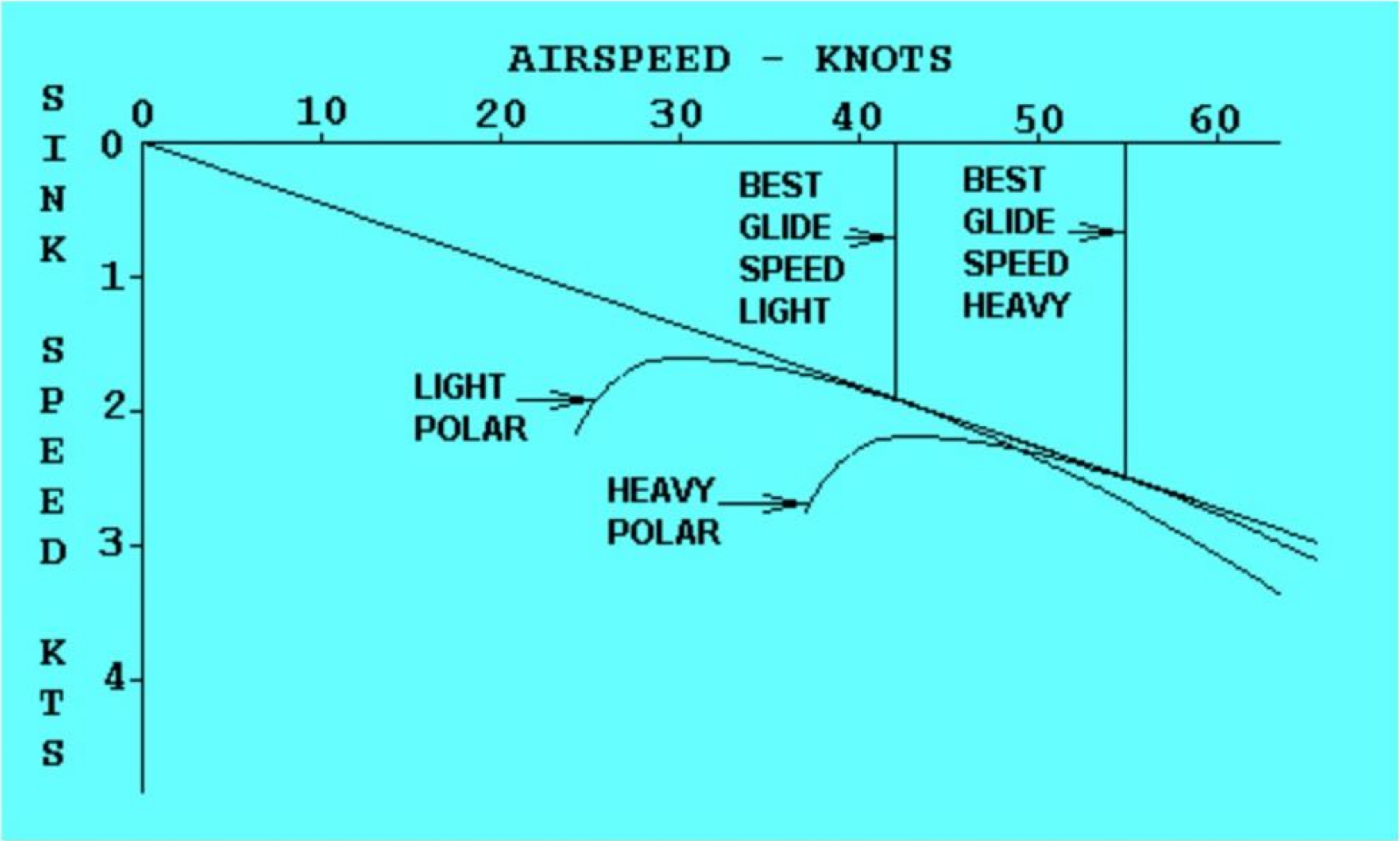
FIGURE 2
DG-101G N101TX POLAR TEST DATA



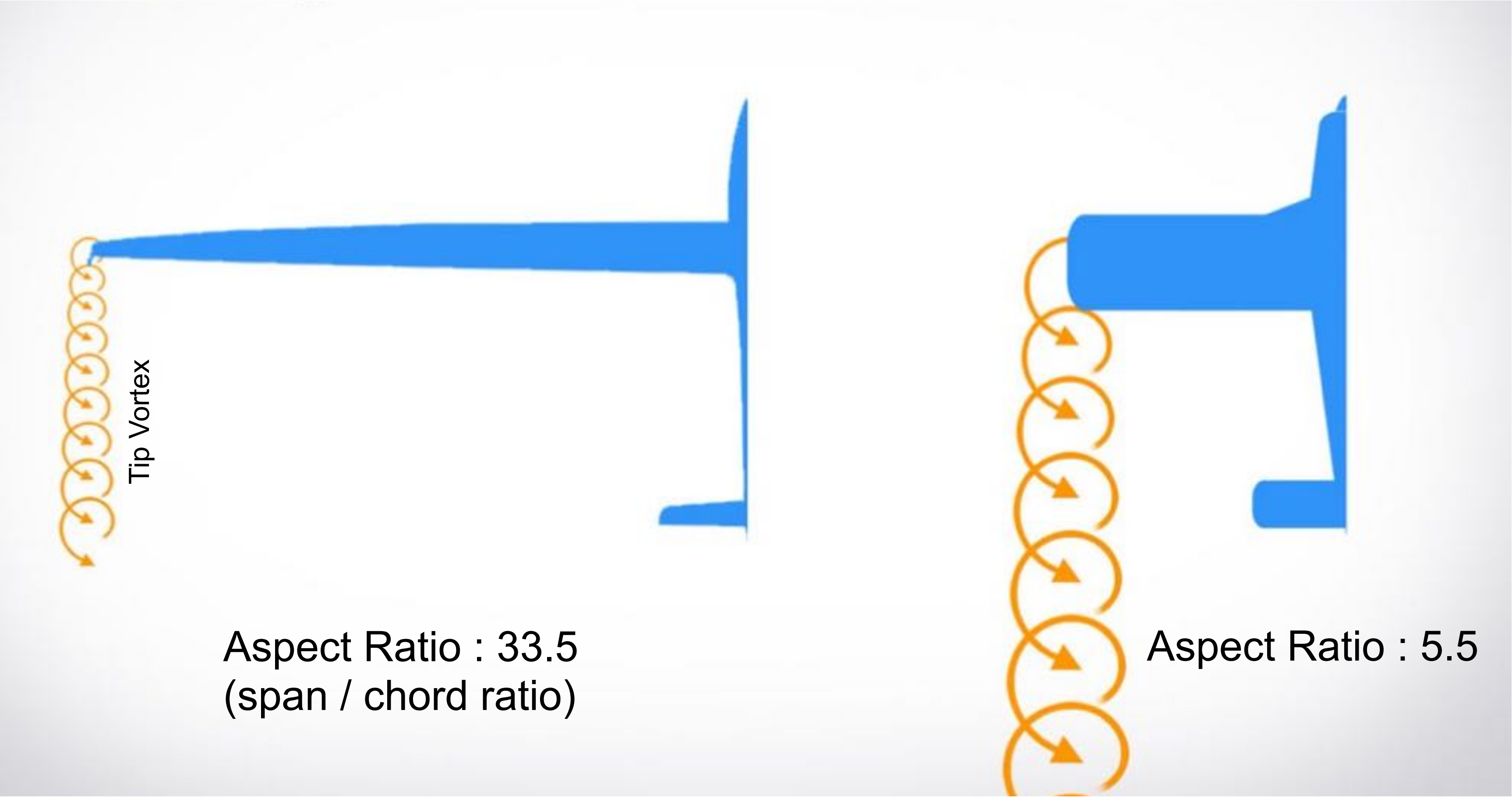
Minimum Sinking Speed



How the Polar alters with Light & Heavy Loads



Challenge between Performance & Strength



Long / Thin wings put major pressures on how to make the glider strong enough

How is a Glider made.?

How are they Made
Start with the Bit you sit in !


Cockpit area


Tail fin


Fuselage Moulds ‘Closed’

How are these Gliders made ?

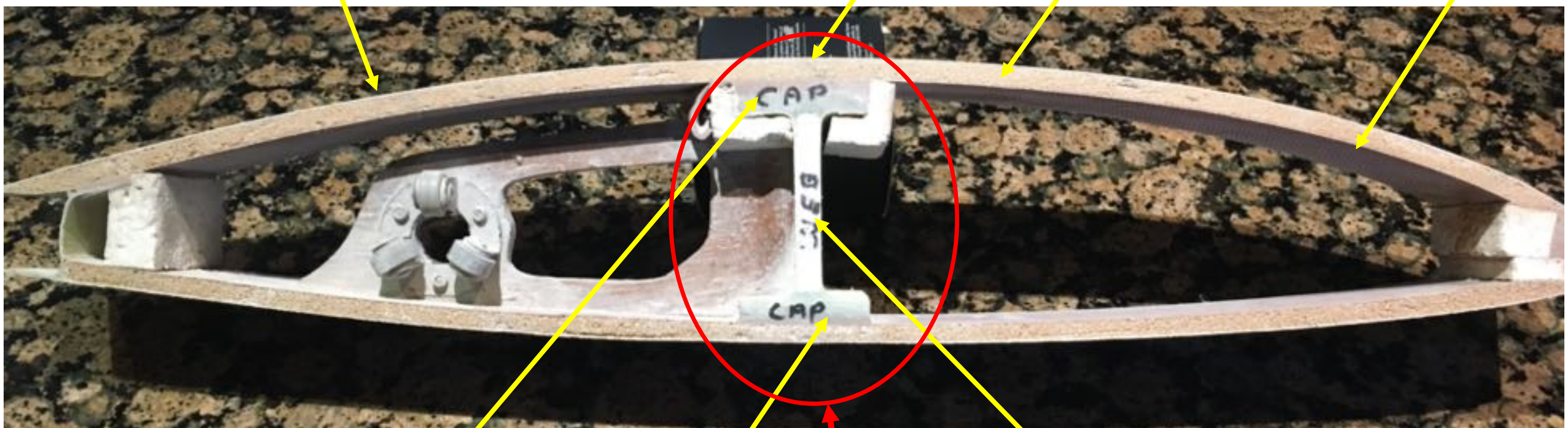
Cross section through a WING (ASW 20)

Outer finish
(Gel coat or Paint)
Degraded by Sun or moisture

Outer skin. (GRP/CFRP)

Foam Core

Inner skin. (GRP/CFRP)



Upper spar Cap
(Typically in compression*)

Lower spar Cap
(Typically in Tension*)

Wing Spar

Shear Web

* = in flight

Forces inside the wing

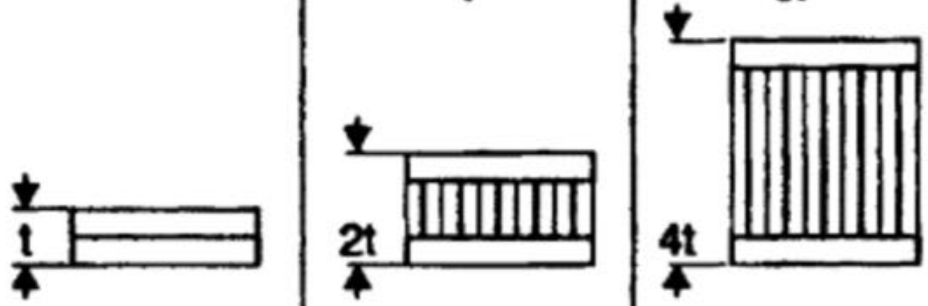
Loads <u>in flight</u>

- When the glider pulls ***UP*** :-
  - The **Compression** in the Upper Cap **increases**
  - The **Tension** in the Lower cap **increases**

  - The **Shear web** overcomes tendencies for two spar caps to **slide relative to each other**

A Composite Glider SKIN

Is a Sandwich of Outer skin / Foam / Inner skin



	Solid Material	Core Thickness t	Core Thickness 3t
Stiffness	1.0	7.0	37.0
Flexural Strength	1.0	3.5	9.2
Weight	1.0	1.03	1.06

This help to overcome **twisting forces** in the wing

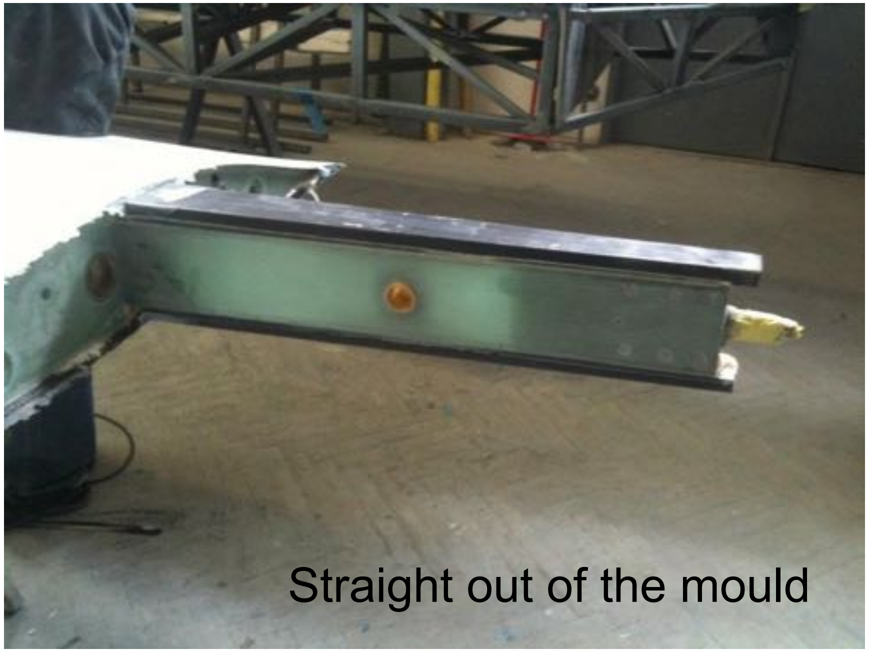
Spar Cap manufacture
How are they made ?

Carbon Rovings being drawn
Through a resin bath

Roving **must** be kept straight as they cure !

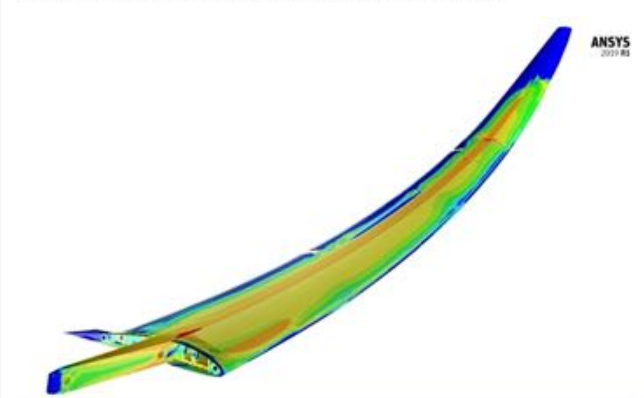
Wing skins being fabricated

Root Rib construction
Wrapping of the spar ends



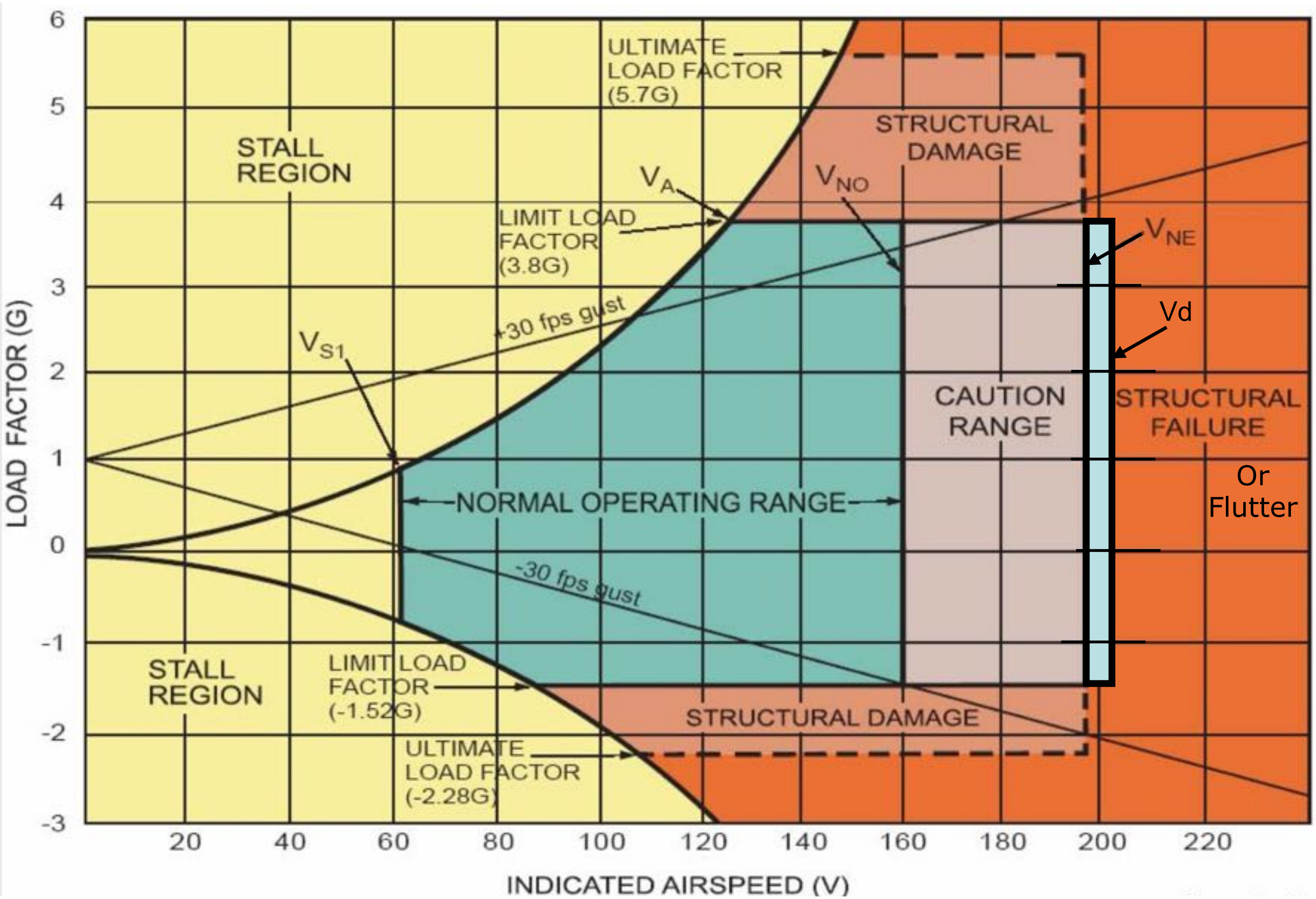
How to test if it is strong enough..?

- It has to be proven by testing !
- A safety factor of 50% should be achieved
- The wing has to be broken
  - This test may be done several times
  - Each test costs many tens of thousands of pounds !



Plot from the FEM calculations showing high loaded areas.

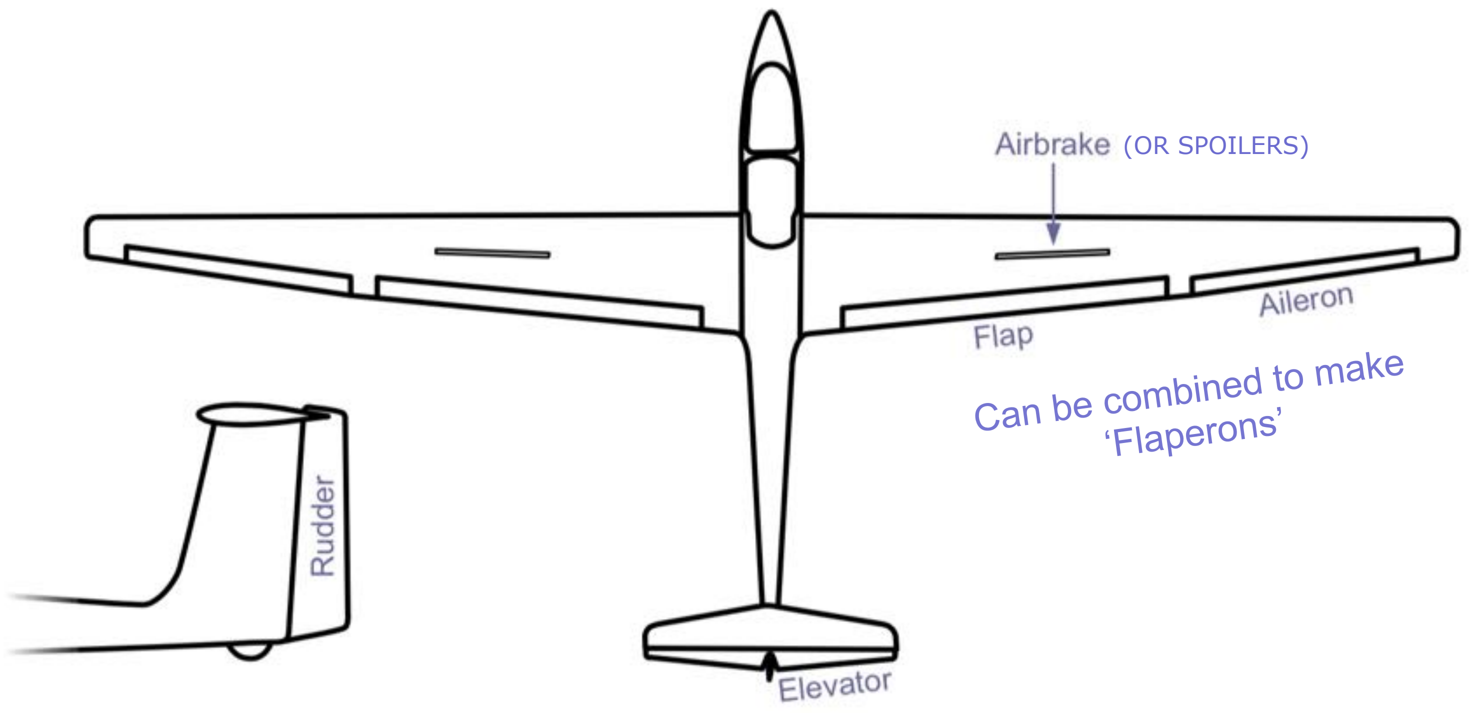
Typical flight Envelope



Risks of flying too Fast

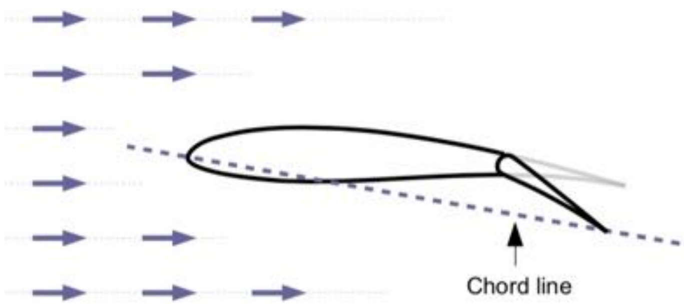
- Flutter is probably the biggest risk
- Control surfaces can be ”left behind”and can amplify the oscillation
- Adding Lead to the leading edge of a control surface can reduce its tendancy to flutter
- Minimising play in control surfaces is critical as a plane gets older
- I have experienced this many years ago and it was pretty frightening !!

Control Surfaces
Where are they & how do they work?



Thanks to Richard Lancaster for the great diagrams

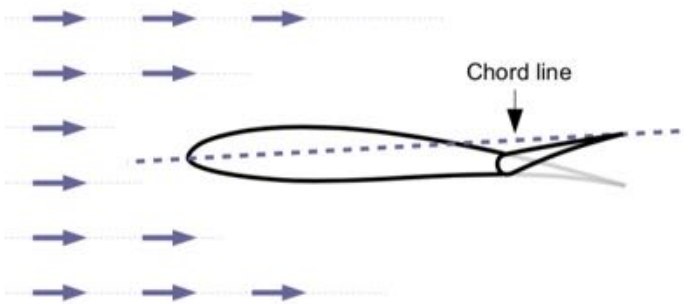
Control Surfaces – How do they work



1 **Deflecting a control surface down:**

- Increases aerofoil camber.
- Increases angle of attack.

Therefore **lift is increased**.

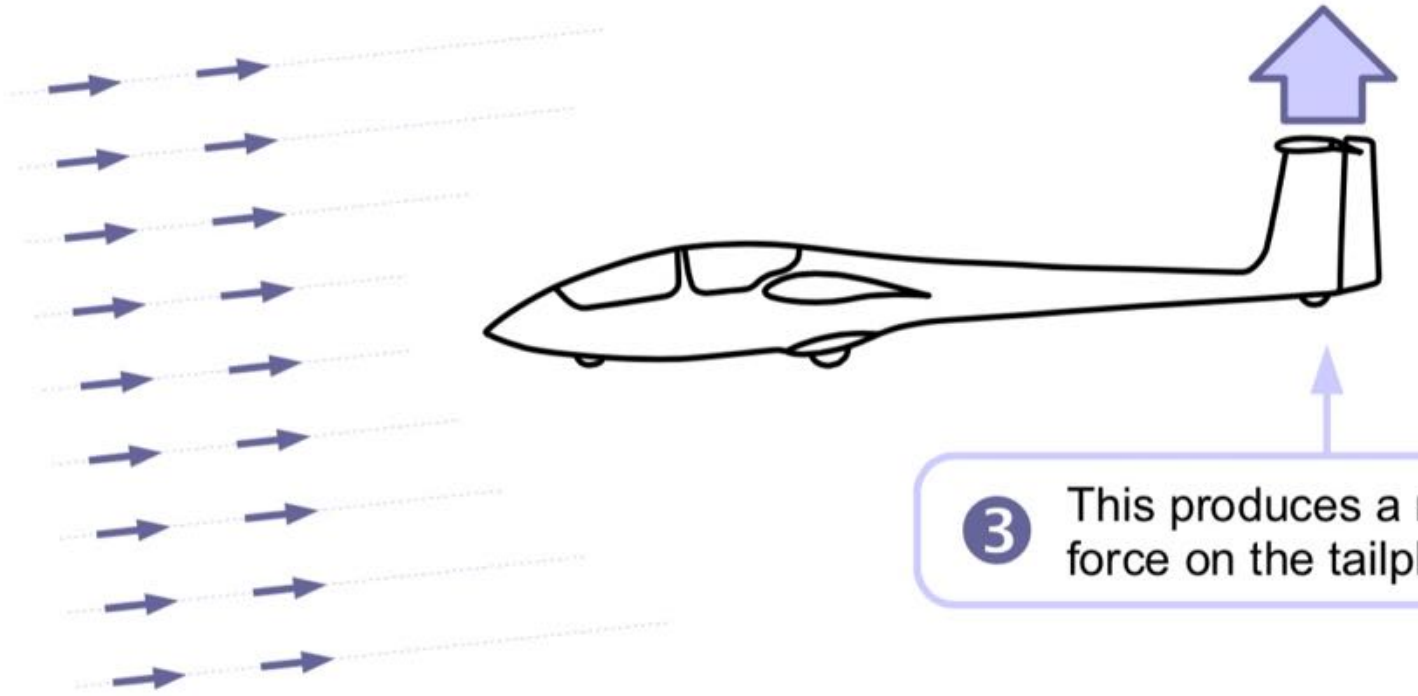


2 **Deflecting a control surface up:**

- Decreases aerofoil camber.
- Decreases angle of attack.

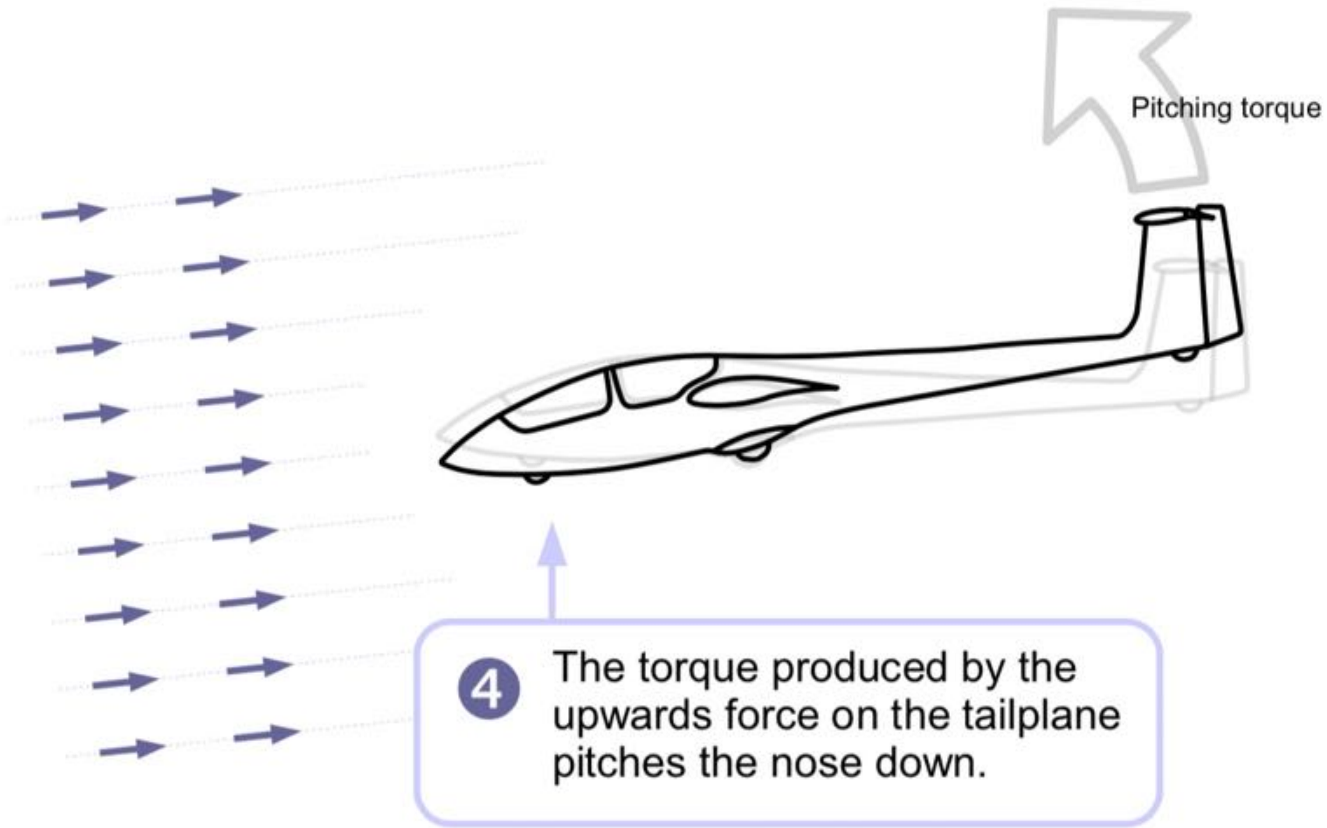
Therefore **lift is reduced**.

Control Surfaces – Elevator



3 This produces a net upwards force on the tailplane.

Control Surfaces – Elevator
PRIMARY effect (PITCH)



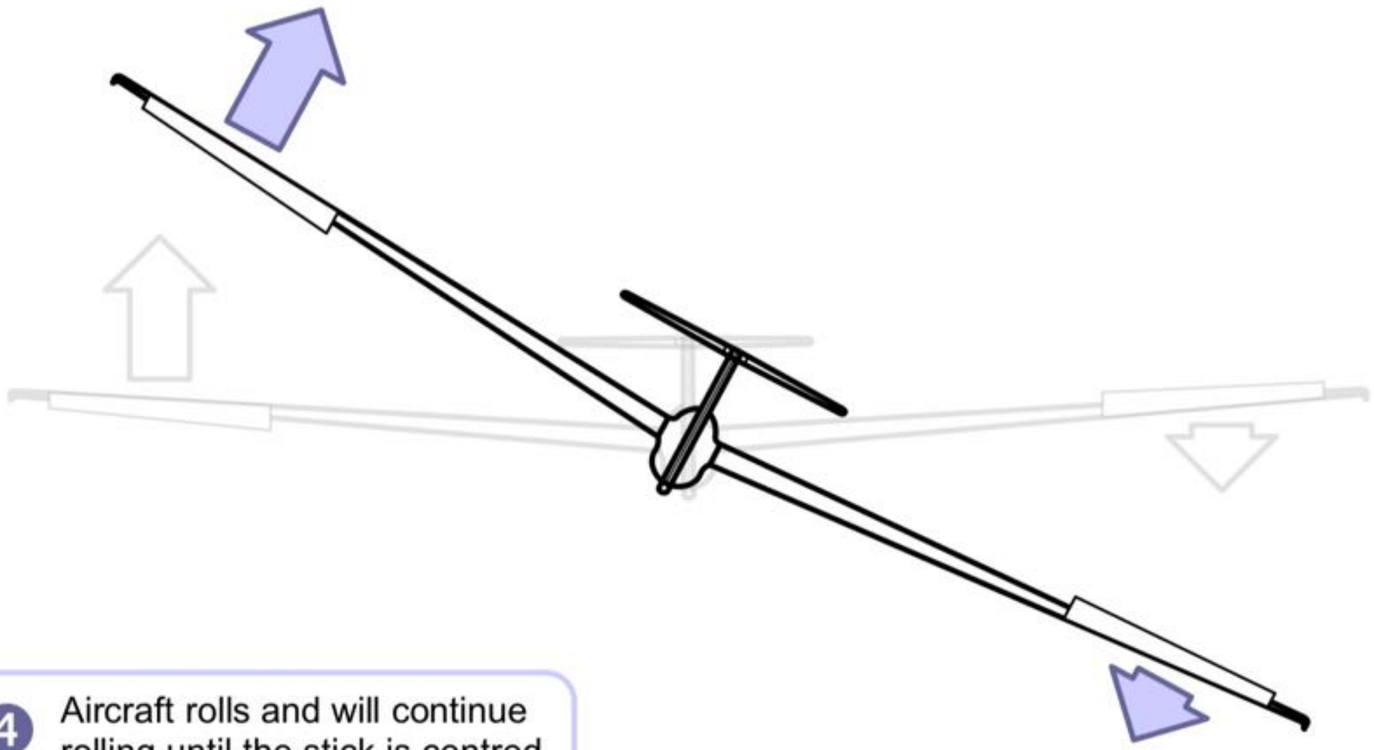
Control Surfaces – Ailerons

1. Aircraft is trimmed and flying wings level. **Stick is pushed to the right.**

2.
- Left aileron deflected down.
- Angle of attack increased.
- **Lift increased.**

3.
- Right aileron deflected up.
- Angle of attack decreased.
- **Lift reduced and possibly made slightly negative.**

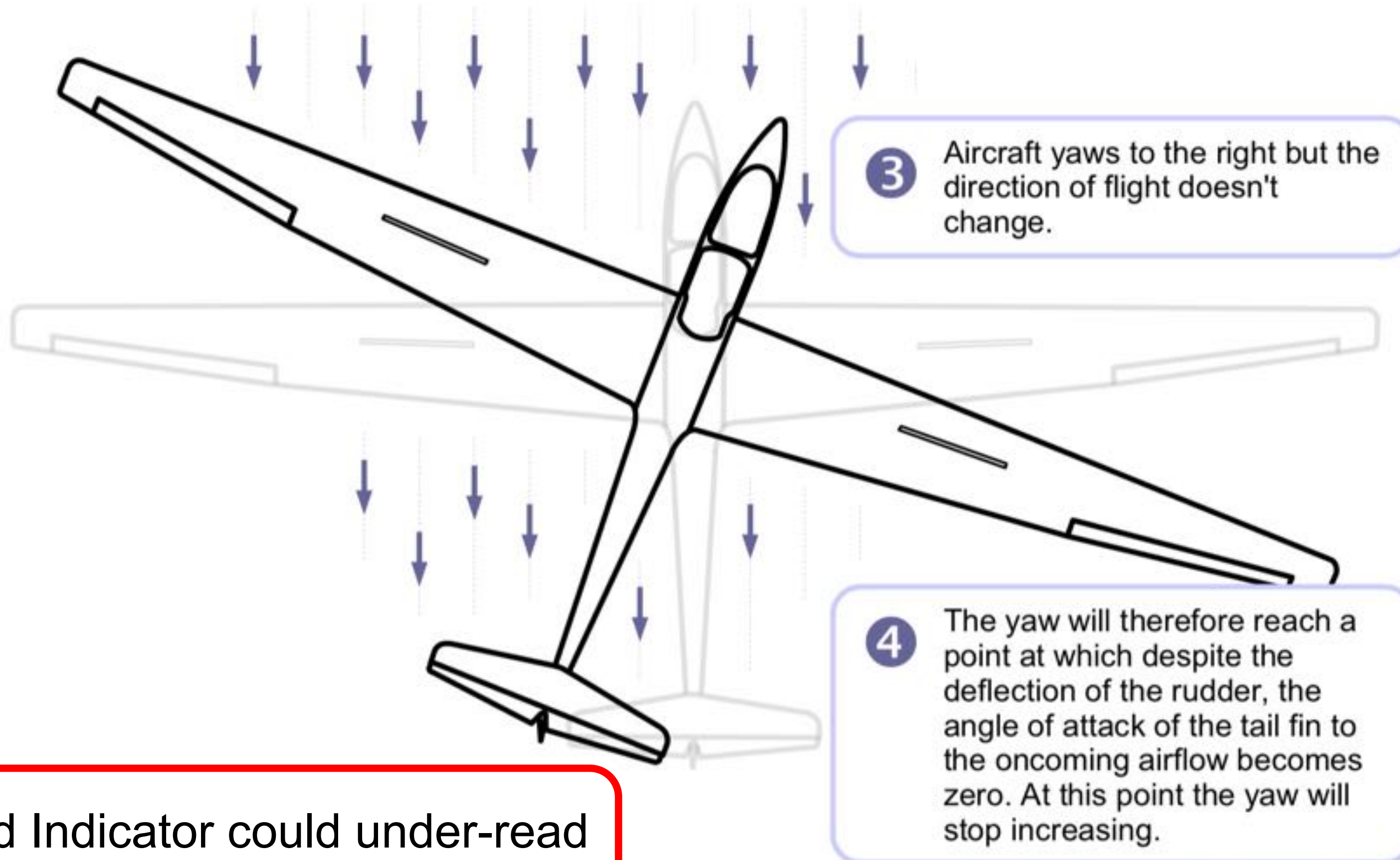
Control Surfaces – Ailerons
PRIMARY effect (ROLL)



4 Aircraft rolls and will continue rolling until the stick is centred and the ailerons return to their neutral position.

Control Surfaces – Rudder

PRIMARY effect (YAW)

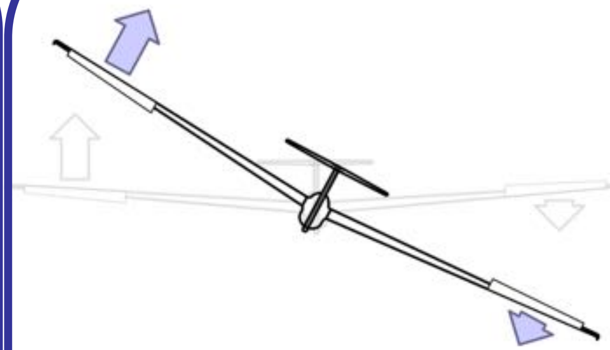


Airspeed Indicator could under-read
With excessive YAW Angles

Primary Effects of Controls

Elevator

PITCH



Ailerons

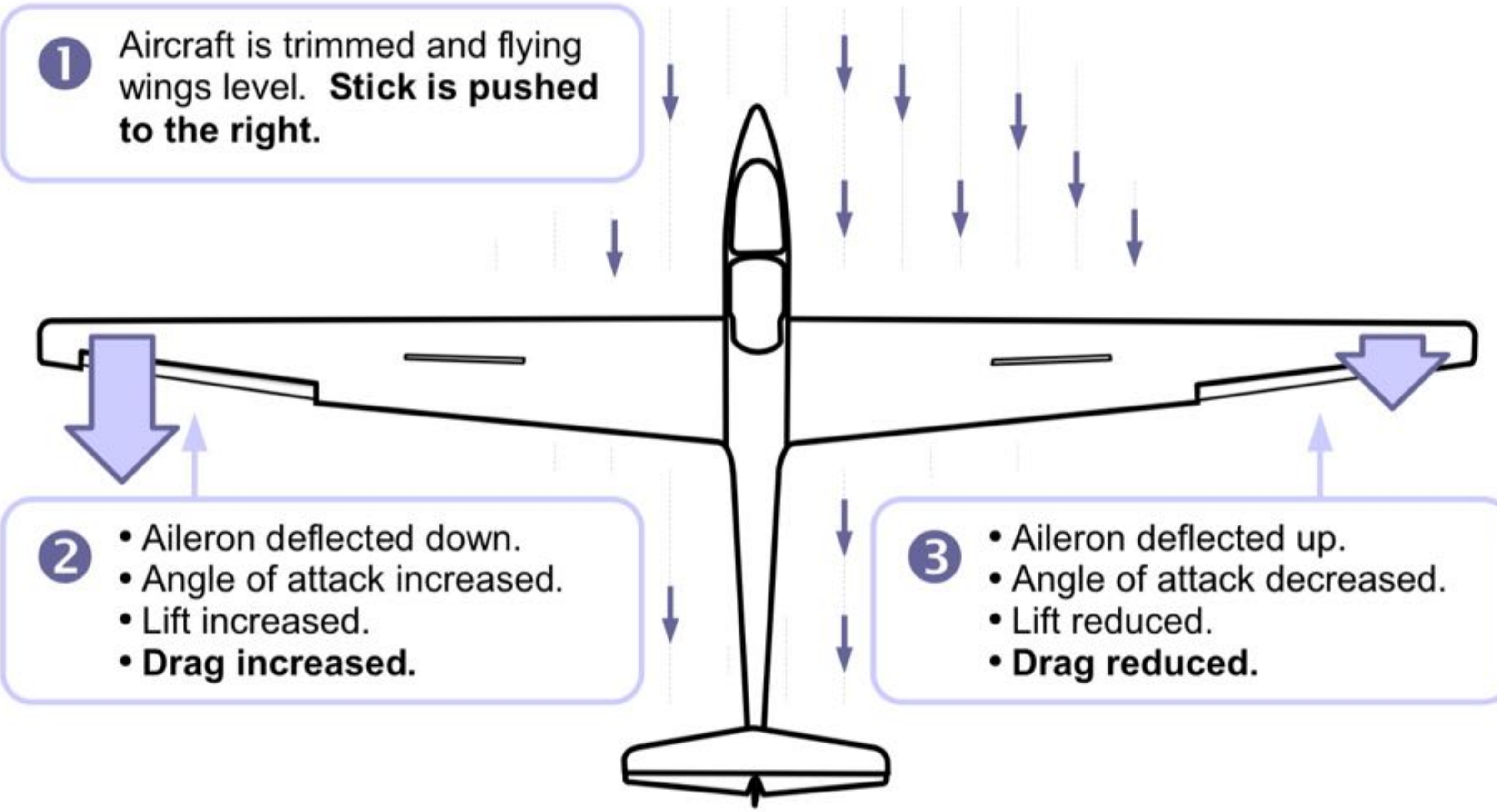
ROLL

Rudder

YAW

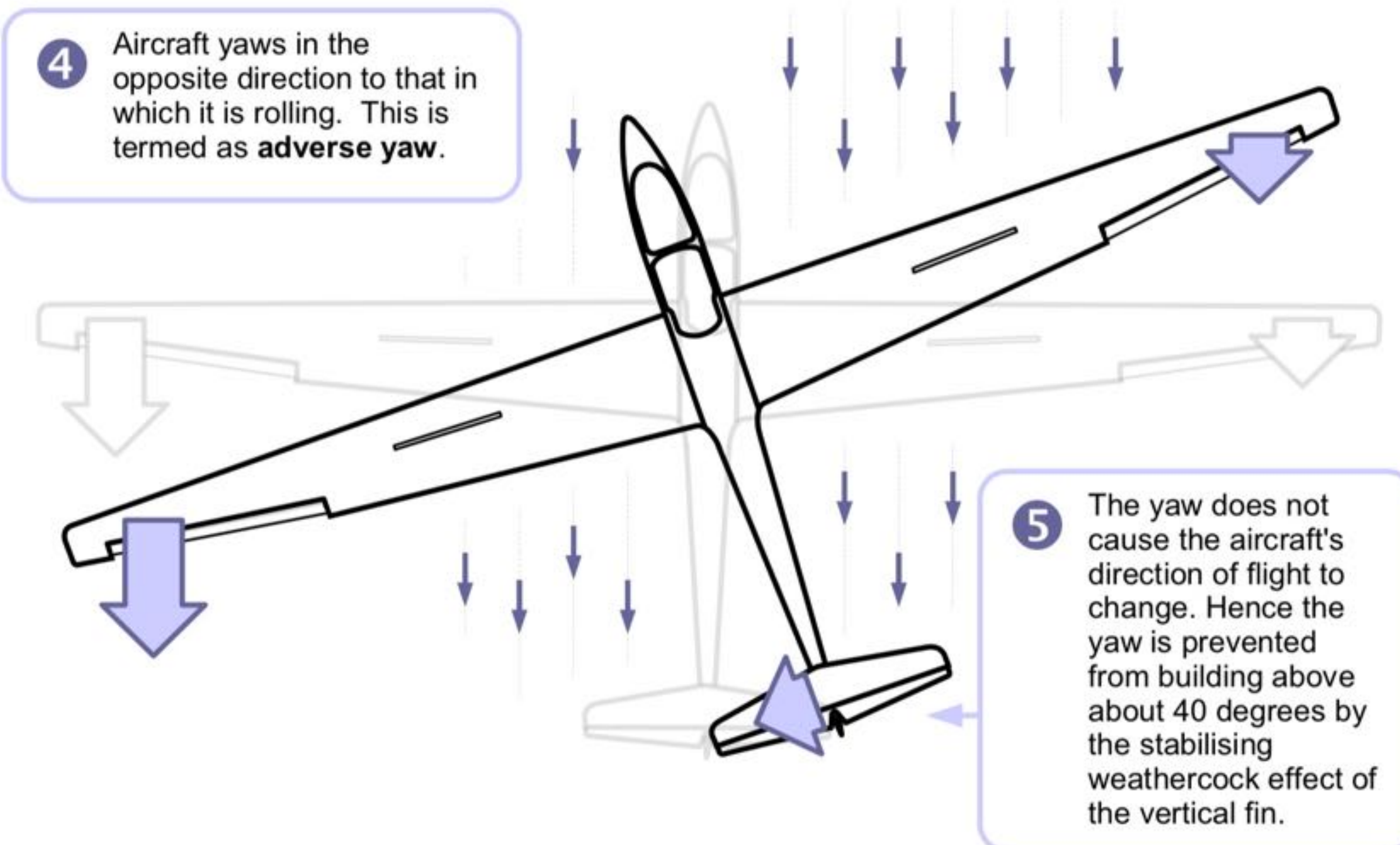
BUT There are some side effects too. - We Call them ***Secondary Effects***

Control Surfaces – Ailerons
SECONDARY effect

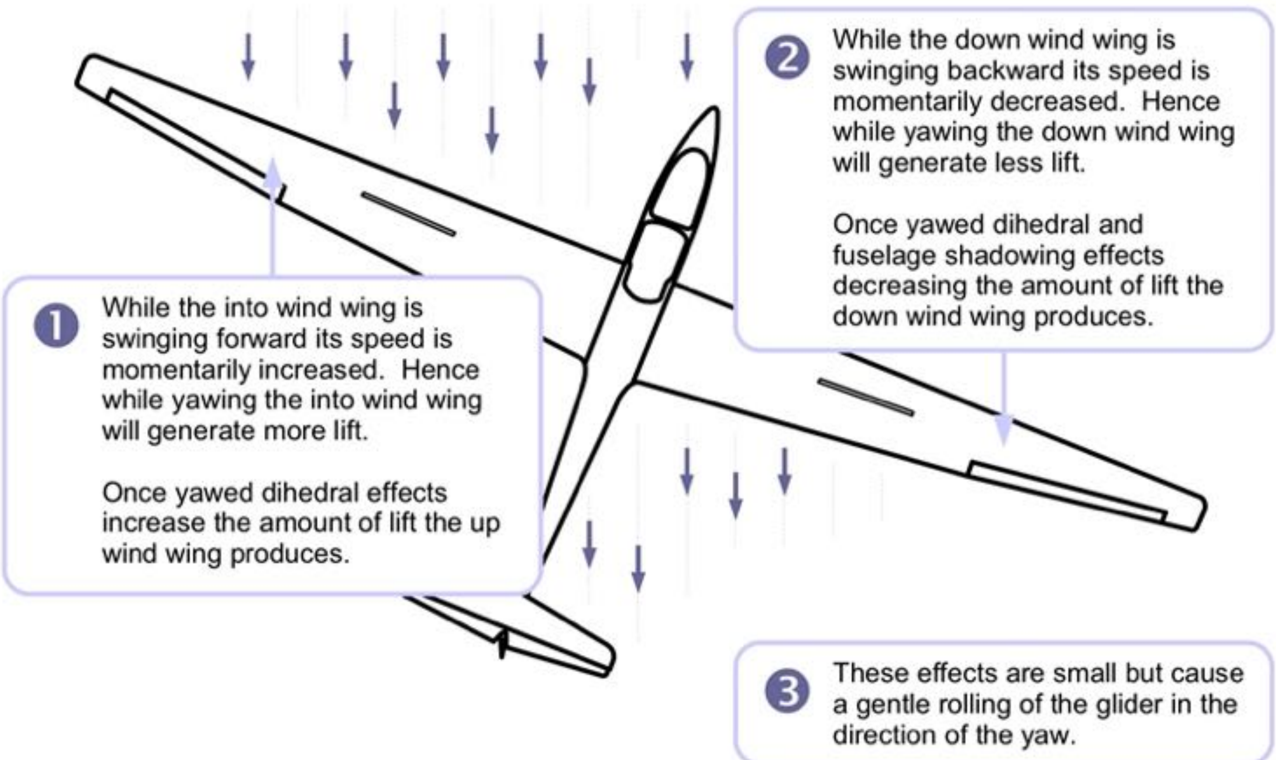


Control Surfaces – Ailerons

SECONDARY effect



Control Surfaces – Rudder
SECONDARY effect



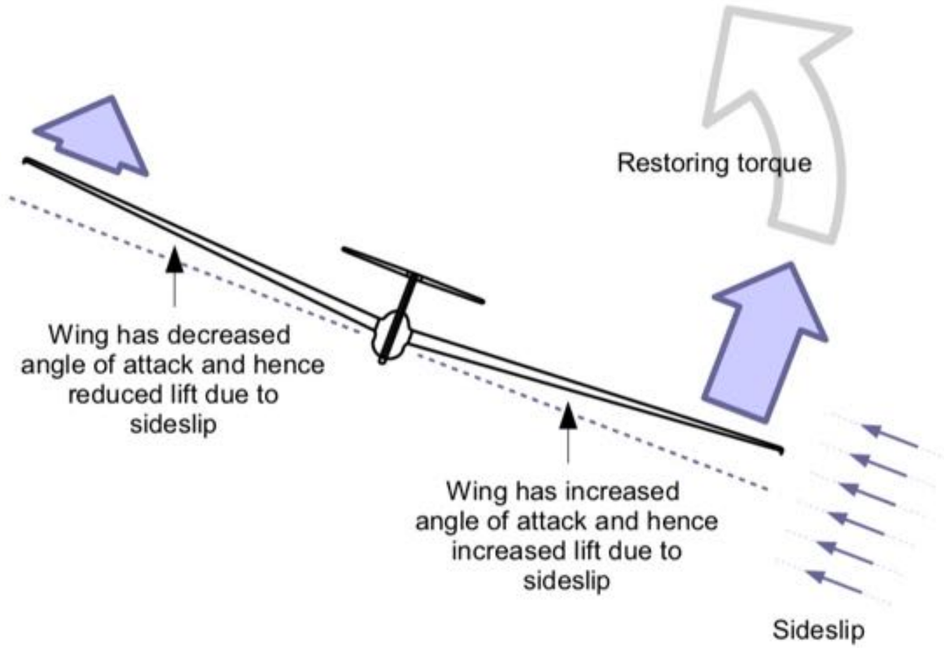
Dihedral Stability

1. If a glider is banked over but insufficient stick back pressure is applied to create enough lift to counteract gravity, then the glider will slip sideways though the air.

2. If the glider has dihedral, then the wing facing into the sideslip will have its angle of attack increased by the air flowing in from the side due to the sideslip. The lift on this wing is therefore increased.

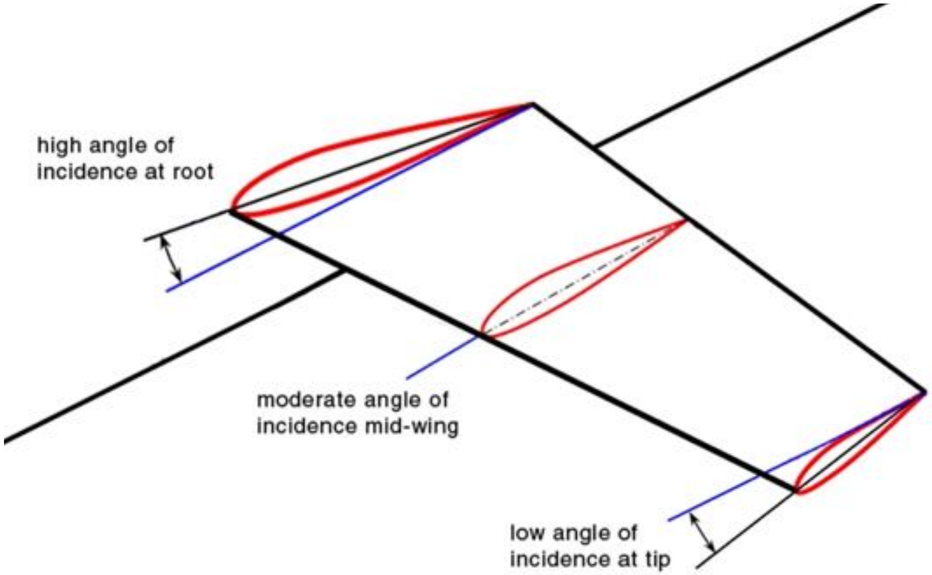
   Conversely the wing facing away from the sideslip will have its angle of attack reduced and hence the amount of lift it is producing will drop.

3. This produces a torque on the glider that will tend to roll it back to wings level.



Note: Anhedral will reduce roll stability.

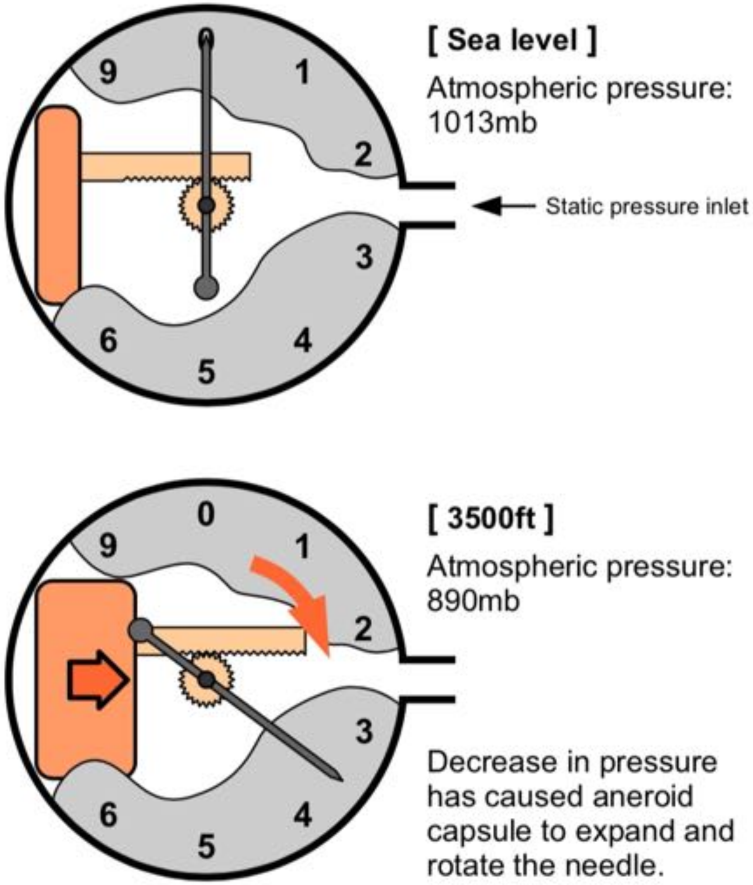
Washout



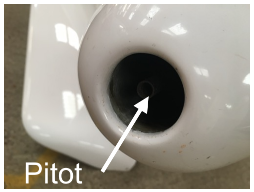
- By ‘twisting’ the wing slightly, the inner portion of the wing will stall first
- This tends to reduce the tendency for a **wing to drop** at the stall
- Washout tends to ***reduce*** performance so it is a compromise

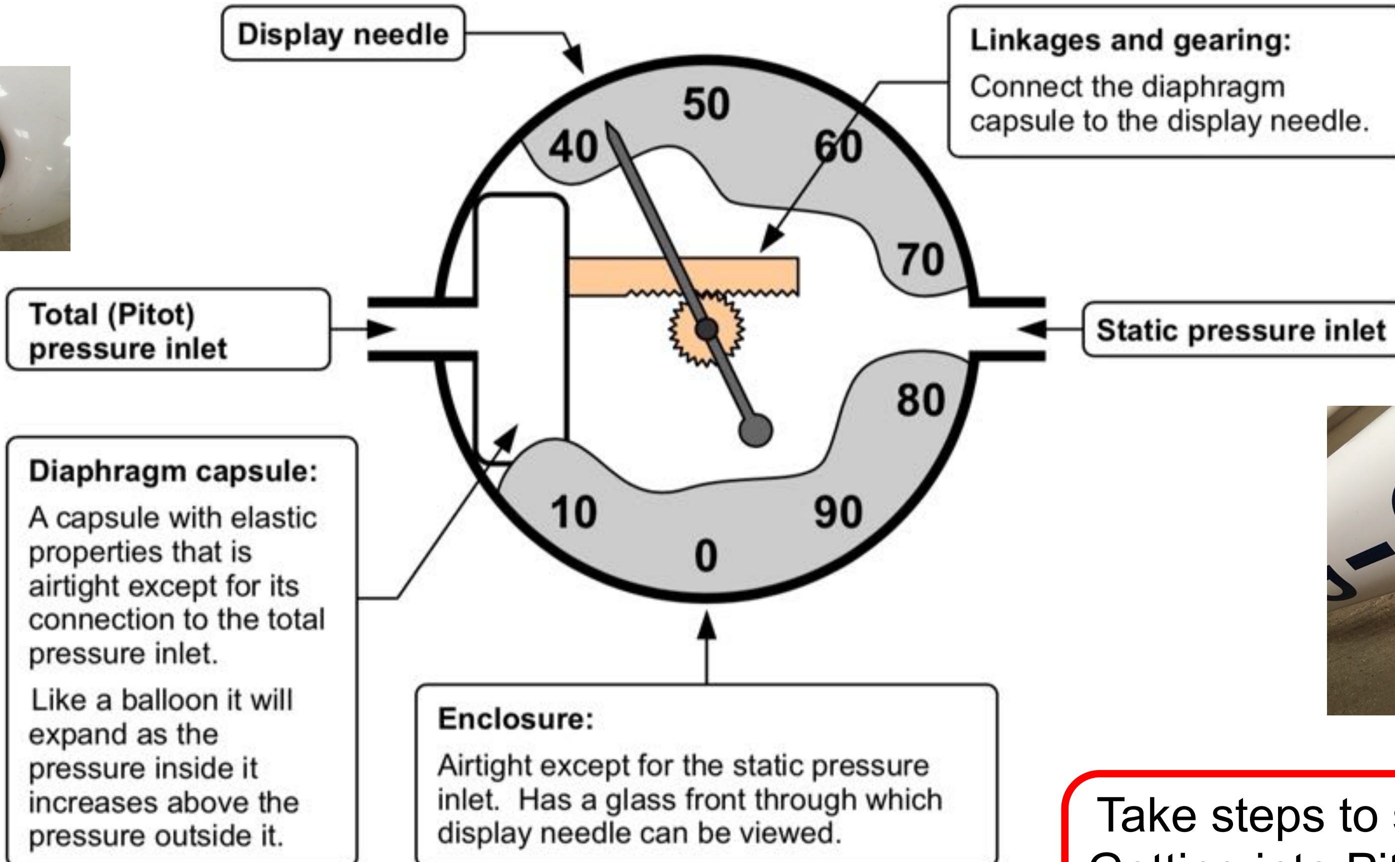
Instruments - Altimeter

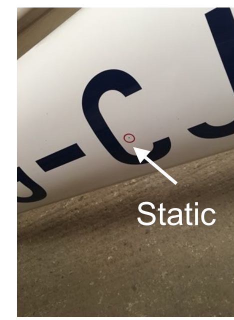
1. The altimeter's static pressure inlet must be exposed to air that is at local atmospheric pressure.
2. The pressure of the air inside the altimeter's casing will therefore equalise to local atmospheric pressure via the static pressure inlet.
3. **Atmospheric pressure decreases with altitude.**
4. As atmospheric pressure decreases the aneroid capsule expands, moving the linkages and hence rotating the display needle(s).



Instruments – Airspeed Indicator (ASI)

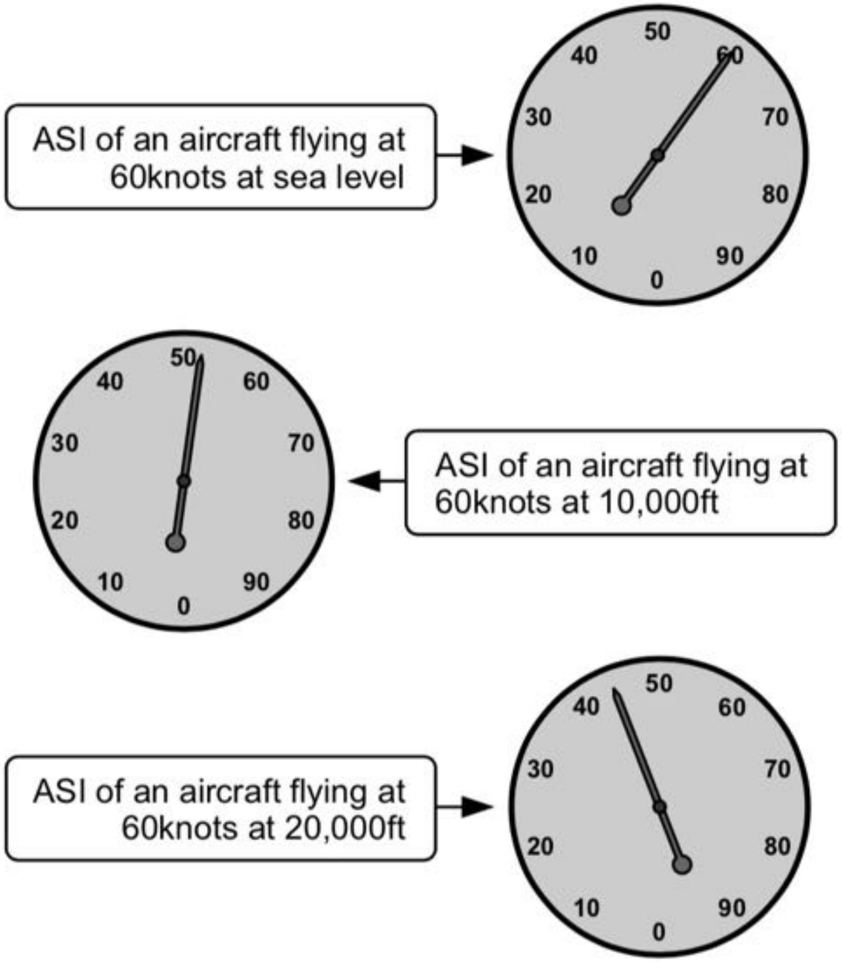






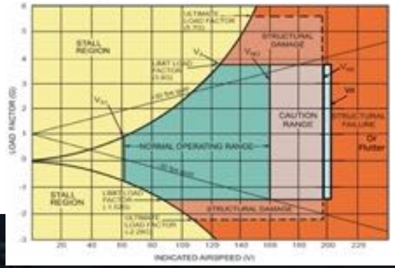
Take steps to stop water Getting into Pitot or static Ports !

ASI – Altitude Effects



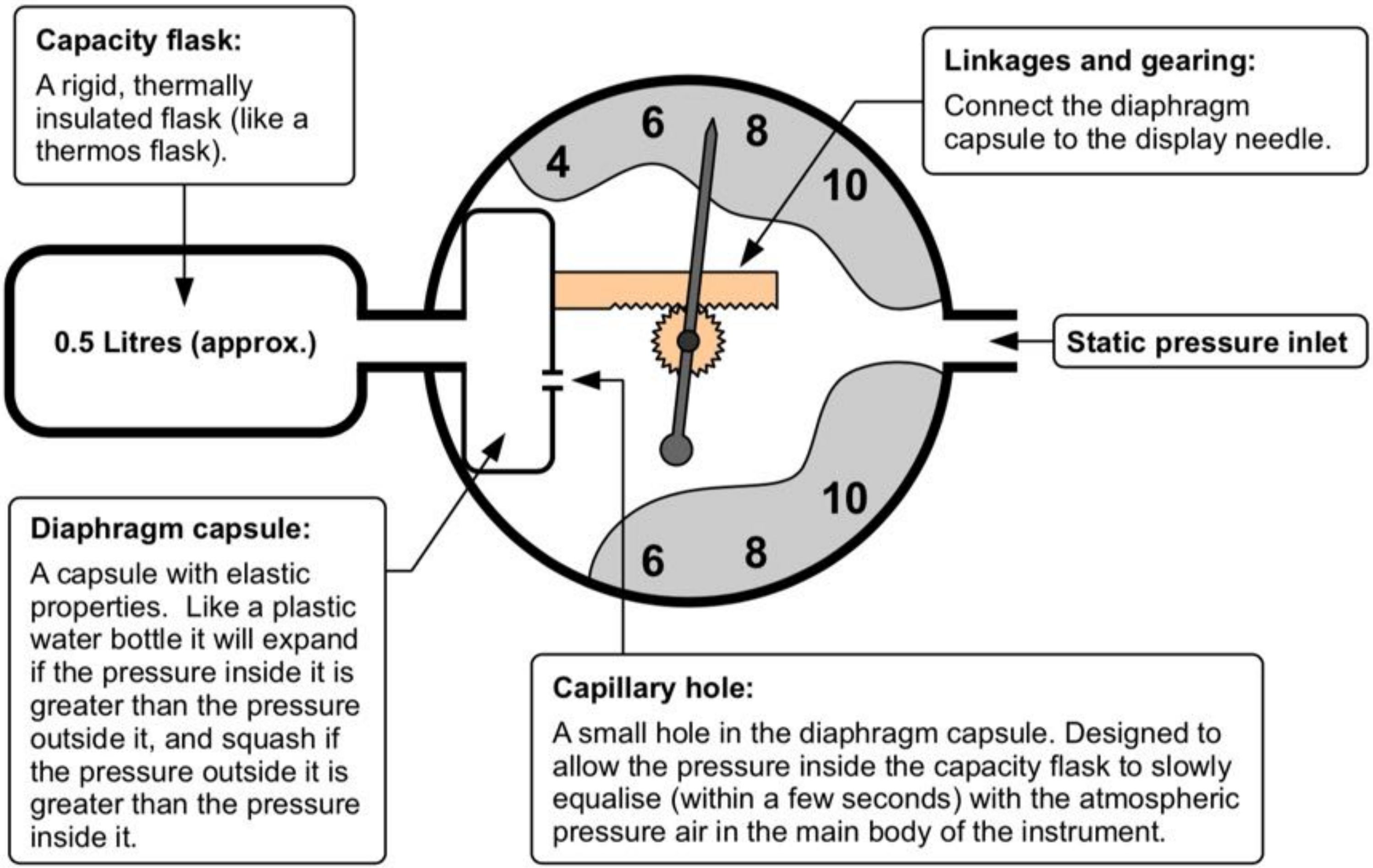
Asi Reads approx. < 50kts
True Airspeed 66 kts !
(over 30% higher !!)

ASI Colour markings
Most glider have these now



- White Arc
  - Acceptable speed range for *positive* flaps to be used
  - Sometimes an 'L' indicates a slower speed for *landing flap*
- Yellow Arc
  - Can only fly here in smooth conditions
- Red Line
  - Maximum speed (VNE)
- Blue Line
  - Best climb speed
- Yellow Triangle
  - Minimum landing Speed

Instruments - Variometer



Instruments – Variometer
Total Energy Compensation

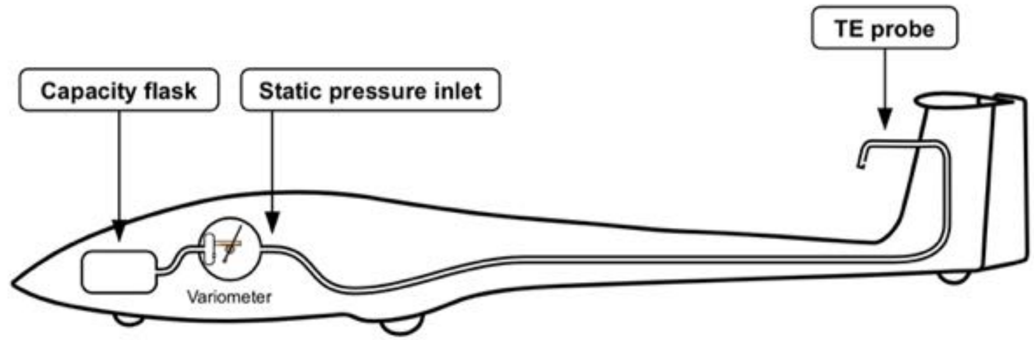
1. When a pilot pulls back on the stick, the glider will convert speed to altitude. Hence the atmospheric pressure around the aircraft will decrease.

2. Nominally an uncompensated variometer would display an increased rate of ascent during this manoeuvre.

3. However because the aircraft slows down, the pressure reduction over the TE probe's vent hole(s) decreases. This cancels out the decrease in atmospheric pressure due to the gain of altitude.

4. The TE compensated variometer therefore doesn't register a "stick induced" change of altitude.

TE Probe can also be on the fuselage tailboom (K21)



1. A variometer connected to a Total Energy (TE) probe rather than the static vents will not display altitude changes that are caused by changes in the glider's speed.

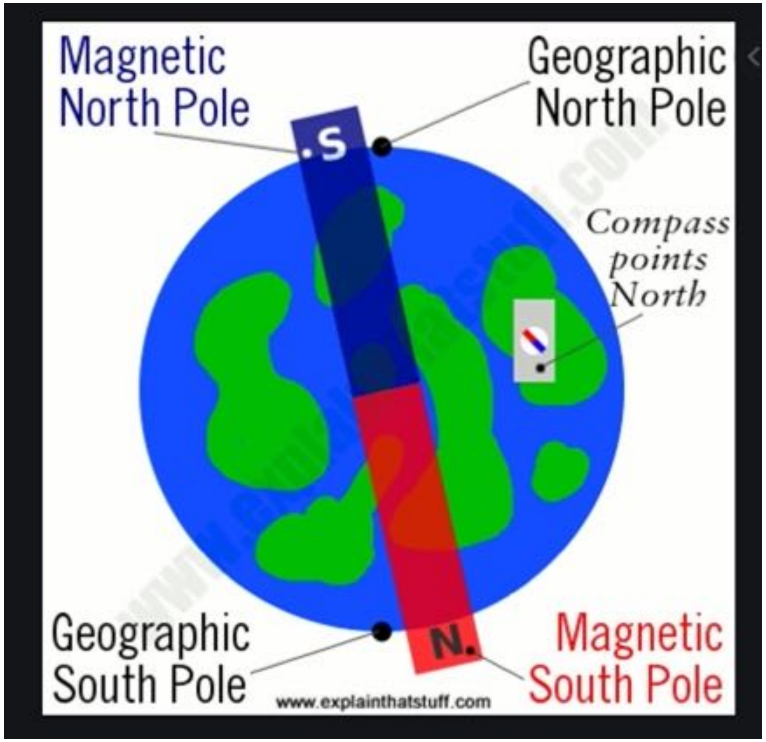
2. The variometer will still display altitude changes caused by the glider's natural sink rate and external up and down drafts such as thermals.

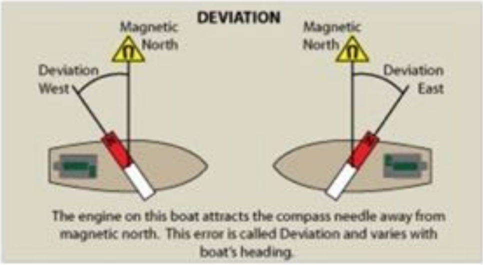
Some modern **'Netto'** vario's subtract the glider Sink-rate to show you the ***'Airmass'*** movement

Compass

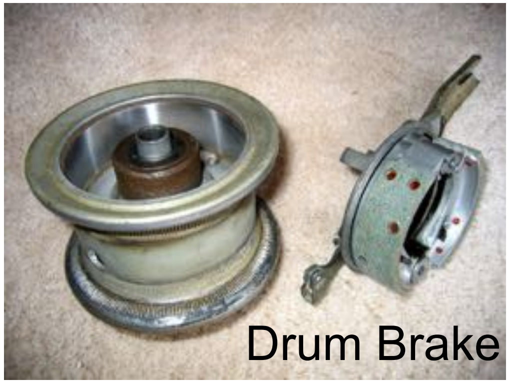
The 'basic' navigation device

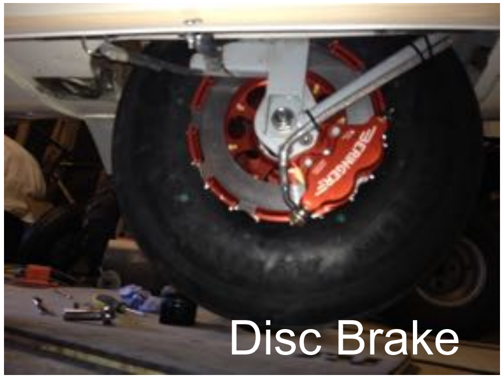
- A compass uses the earths magnetic field to allow you to determine which way is North
  - Once you know this basic navigation is possible
- Compasses have some 'issues' that are worth knowing
  - *Variation*
    - A compass points to magnetic north and not true north
    - The Variation varies over the earth and changes with time
  - *Deviation*
    - A compass can have errors due to nearby metallic items





Undercariage / Wheels / Tyres / Tubes





- Wheel size is typically governed by sailplane Maximum All-Up-Weight
- Creative solutions have been developed for heavy / slender gliders
- Most tyres have tubes, but recently tubeless are being used (ie Shark)

Glider Electrics

- Normally based around 12v DC solutions (Battery)
- Glider wiring is usually protected with Fuses or Circuit Breakers and without this could Melt ! -> See Video
  - Fuses break the connection quickly but need to be replaced
  - Circuit Breakers take longer to break the connection but can usually be reset
- Wiring is 'Rated' to cope with peak currents
- Main Battery fuse should be located as *close* to the battery as possible

These fuses and breakers are 'rated' to protect the associated item Ie : Radio, Transponder, Vario etc

Control Integrity

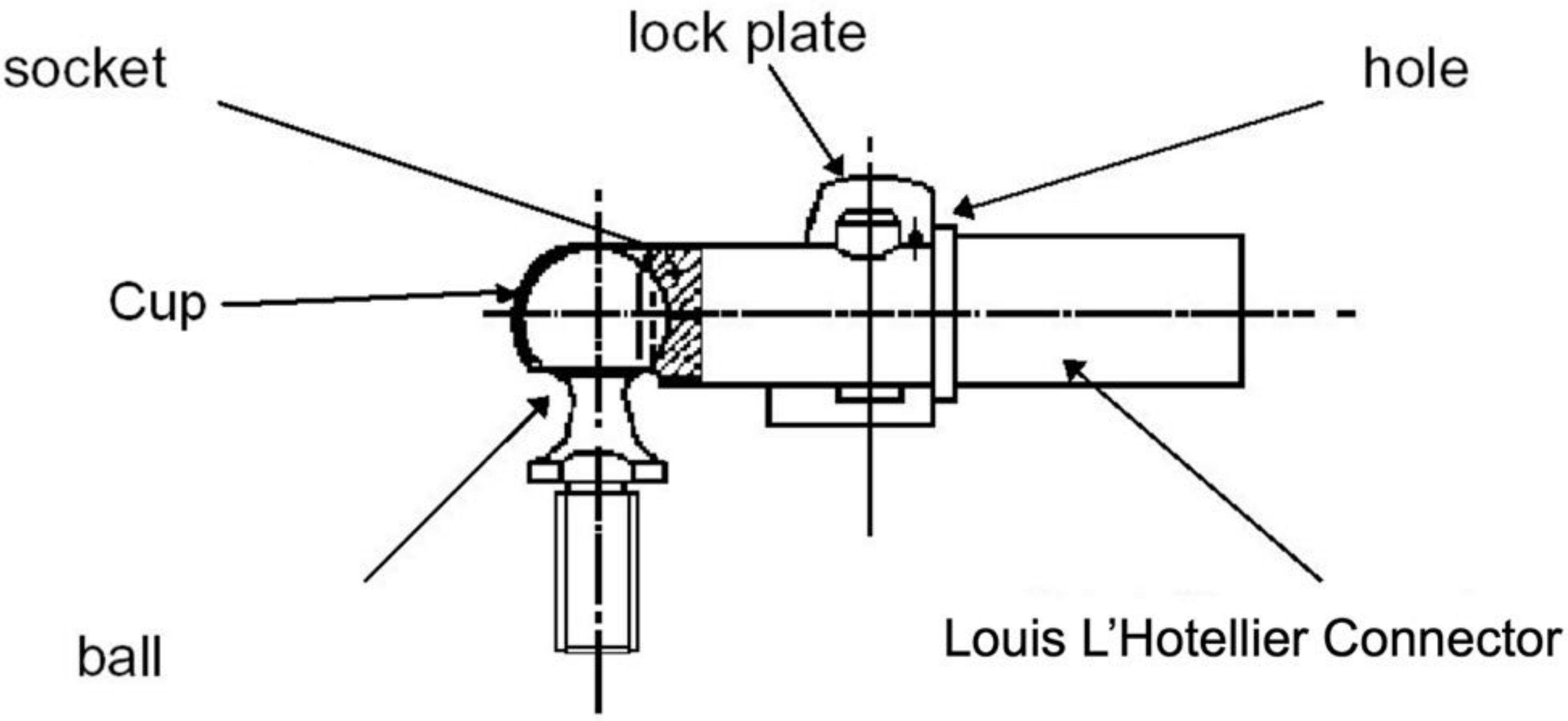
- Later gliders (ie LS4b, DG505 etc) use automatic control connections
  - These are highly reliable, but mis-rigging can be done is the person is careless
  - Even with Auto connection, ALWAYS check for normal control operation afterwards and *do positive control checks*

- On earlier fiberglass gliders, L-Hotelier connectors are used and whilst these are excellent, it is *essential* that precautions are taken

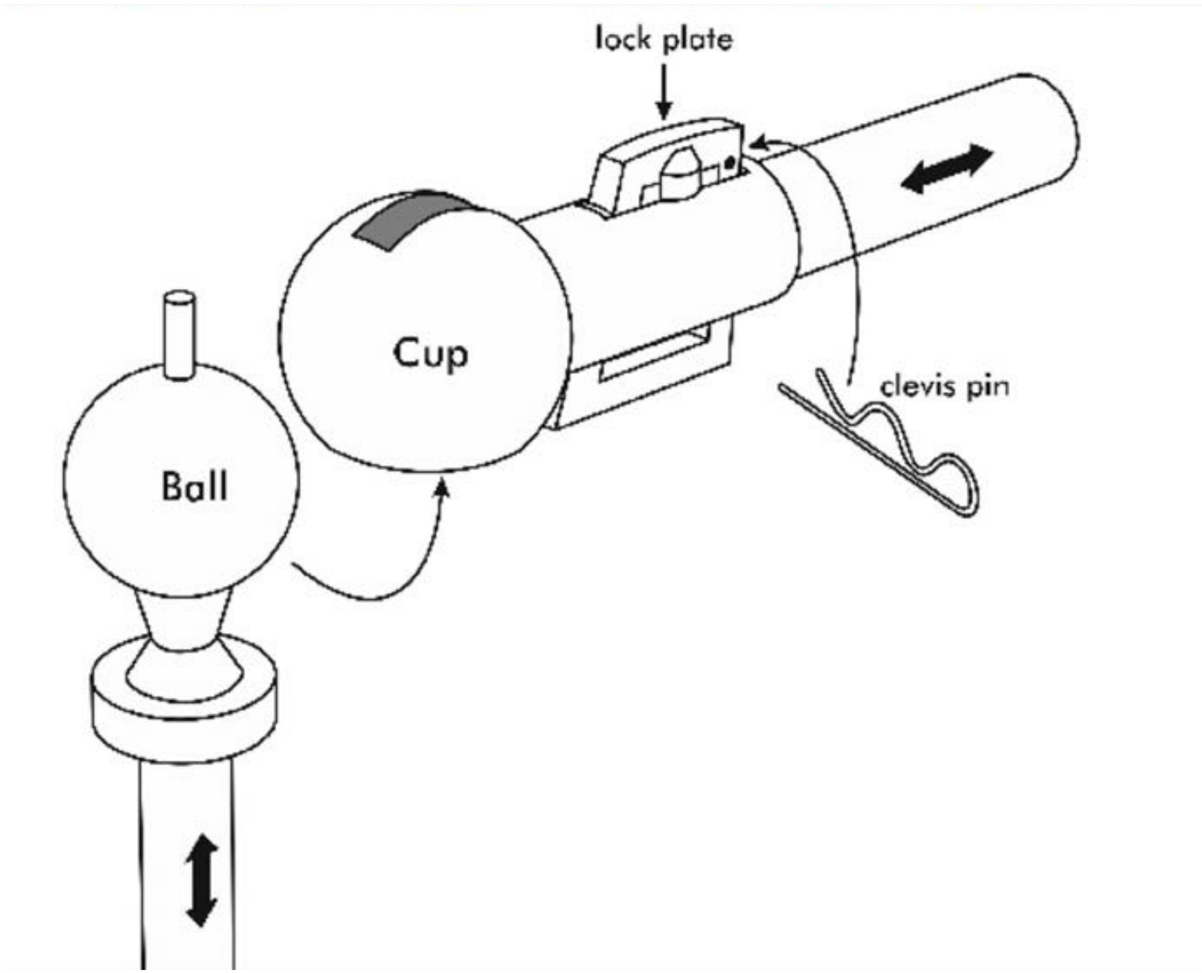
- If in doubt, ALWAYS ask for help from a more experienced member / instructor or Glider inspector

- Some glider types are more prone to misrigging (ie Pegasus, ASW19, ASW20, Pik20

L-Hotellier Connectors



L-Hotelier Connectors



Wederkind locking sleeve instead or the R-Clip

L’Hotelier Connectors – Potential Risks

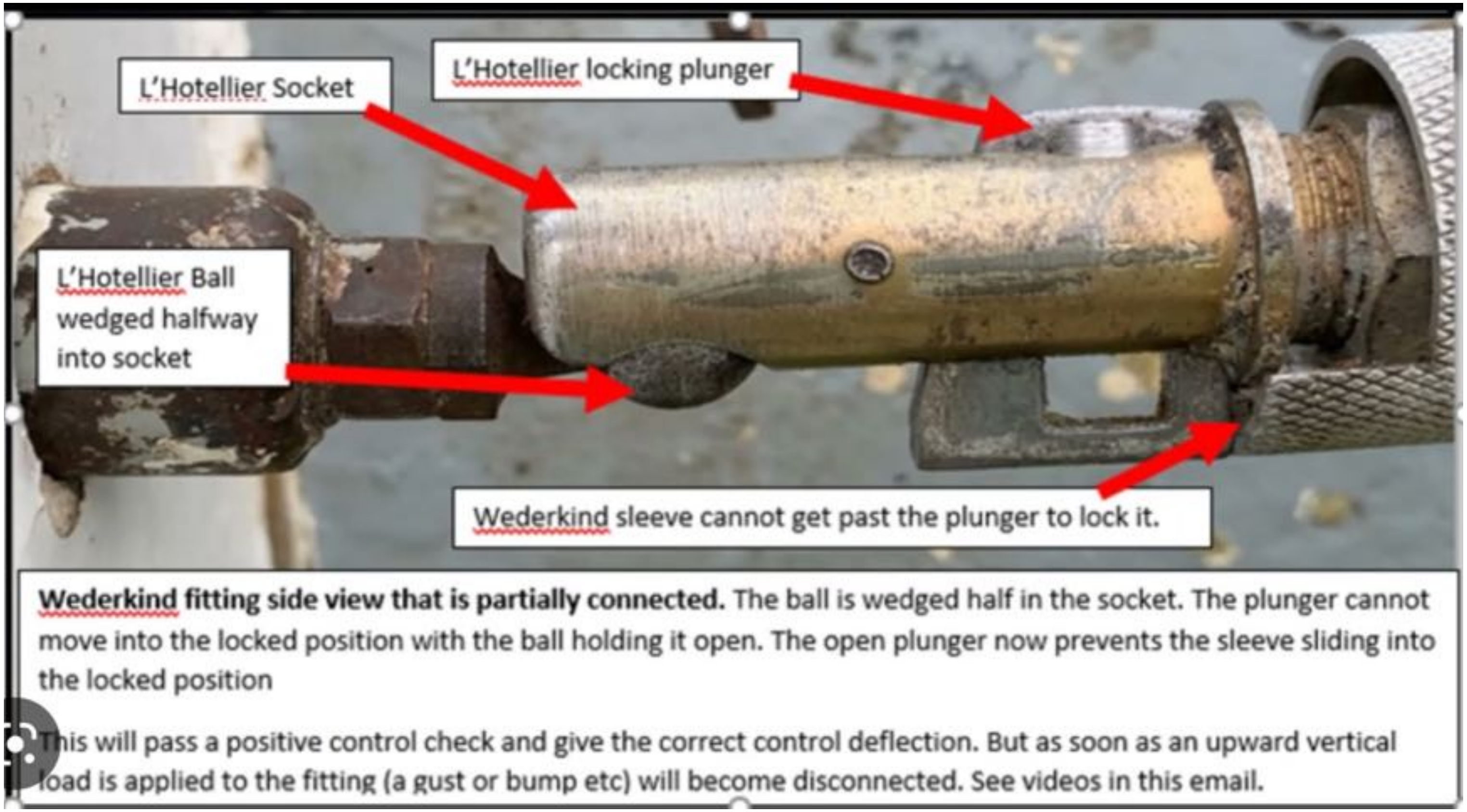
- L’Hotellier connectors are very reliable provided they are operated correctly and suitable checks are performed to confirm the connection is made and secure

- It is recommended to get the connections duplicate inspected (is a policy for club gliders, and recommended for private ones)

- Make sure the connector is locked
  - R-clip correctly through the locking hole. OR
  - Wederkind sleeve in the correct place when this locking sleeve is used

- ALWAYS try and pull the connection off the ball to make sure it is firmly attached

Wederkind sleeve incorrectly located

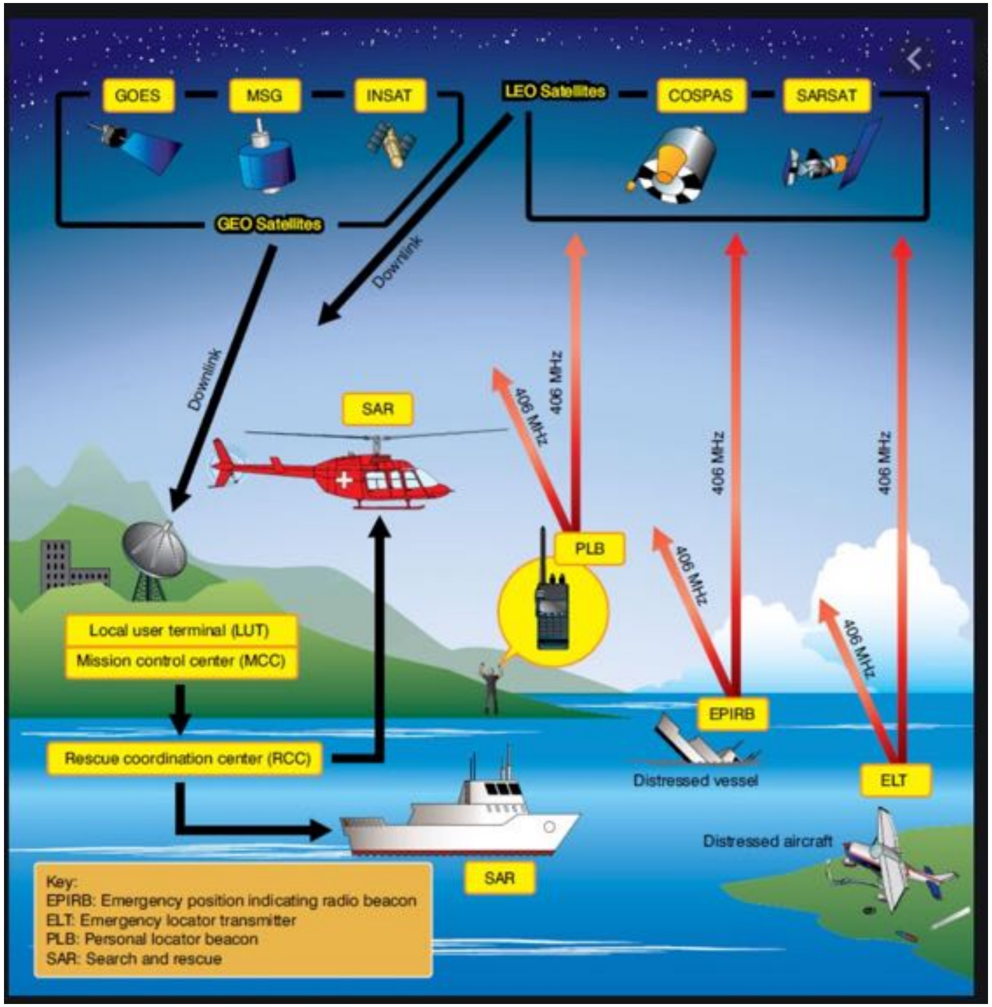


https://www.youtube.com/watch?v=ydUy2Jx097o

Ancillary Items - Parachutes

- Parachutes give you a spare on-board personal plane !
- They can save your life and should be treated *carefully*
- Never let them get wet or damp
- They should be repacked every year
- They should be worn correctly
- Like the Glider, they should be inspected Daily
- They have a ‘Life’ or 15-25 years
- They are expensive !.. £2500 - £3000 each

Ancillary Items – Emergency Location Transmitters (ELT's)



Some Supporting 'Gadgets' that pilots use

- Navigation Aids
  - Automatic Direction Finder
    - **ADF** Uses Non Directional Beacons (NDB's) to determine bearing and heading
    - Is being slowly disbanded
  - Very HF Omnidirectional Range
    - **VOR** Receives a 'radial' from a beacon and if two are used can determine aircraft position
    - Replaced ADF and used for decades but slowly being phased out
  - Global Positioning System
    - Accurate position in X,Y and Z based on time-shift from 4 (or more) satellites.
    - GPS altitude has about 200' error
    - Many systems use GPS, ie Oudie's

- Conspicuity Aids
  - Mode S Transponders
    - Allows controllers to see information about aircraft and its position
    - Can trigger on-board collision avoidance systems
  - Automatic Dependent Surveillance – Broadcast
    - ADS-B is a development from Mode S transponders so aircraft can ALSO see what controllers can see
  - FLARM
    - Onboard collision avoidance systems and allows other users to see nearby aircraft position
  - OGN-R
  - PilotAware

Glider Manuals

All New Certified Sailplanes have these manuals

FLIGHT MANUAL

- General
- Limitations
- Emergency Procedures
- Normal Procedures
- Performance
- Weight & balance
- Systems Description
- Handling
- Supplements

MAINTENANCE MANUAL

- General
- Descriptions & Adjustments
- Inspections
- Maintenance
- Detailed instructions
- Weight & balance
- Instrumentation
- Special Tools
- Parts List

REPAIR MANUAL

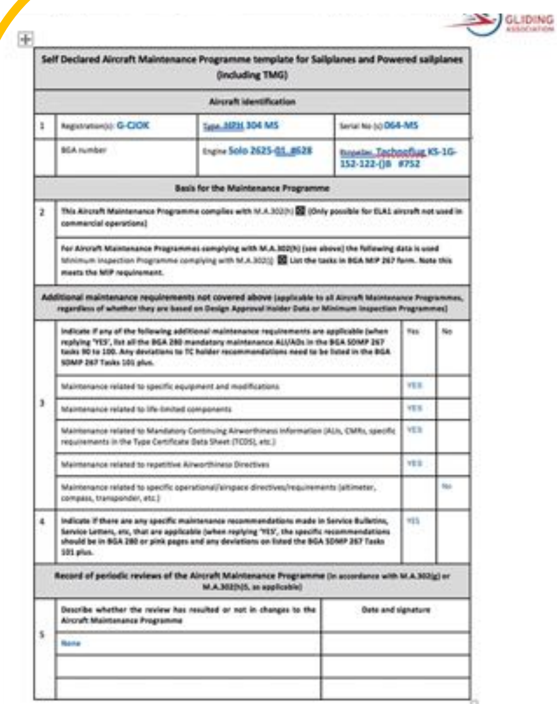
- Minor Damage
- Tools & Facilities
- FRP repairs
- Types of Fabrics

In GREY indicated a non-approved section

Airworthiness Requirements
(Not a complete set)

Certificate of Registration
Certificate of Airworthiness
Noise Certificate (if applicable)

Done When New or something Changes



Self Declared Aircraft Maintenance Programme template for Sailplanes and Powered sailplanes (including TMG)				
Aircraft identification				
1	Registration(s): G-CJOK	Type: MPH 304 MS	Serial No (s) 064-MS	
	BGA number	Engine Solo 2625-01 #628	Propeller: Tachoflug KS-1G-152-122-()B #752	
Basis for the Maintenance Programme				
2	This Aircraft Maintenance Programme complies with M.A.302(h) ☒ (Only possible for ELA1 aircraft not used in commercial operations)			
	For Aircraft Maintenance Programmes complying with M.A.302(h) (see above) the following data is used Minimum Inspection Programme complying with M.A.302(i) ☒ List the tasks in BGA MIP 267 form. Note this meets the MIP requirement.			
Additional maintenance requirements not covered above (applicable to all Aircraft Maintenance Programmes, regardless of whether they are based on Design Approval Holder Data or Minimum Inspection Programmes)				
3	Indicate if any of the following additional maintenance requirements are applicable (when replying 'YES', list all the BGA 280 mandatory maintenance ALI/ADs in the BGA SDMP 267 tasks 90 to 100. Any deviations to TC holder recommendations need to be listed in the BGA SDMP 267 Tasks 101 plus.	Yes	No	
	Maintenance related to specific equipment and modifications	YES		
	Maintenance related to life-limited components	YES		
	Maintenance related to Mandatory Continuing Airworthiness Information (ALIs, CMRs, specific requirements in the Type Certificate Data Sheet (TCDS), etc.)	YES		
	Maintenance related to repetitive Airworthiness Directives	YES		
	Maintenance related to specific operational/airspace directives/requirements (altimeter, compass, transponder, etc.)		No	
4	Indicate if there are any specific maintenance recommendations made in Service Bulletins, Service Letters, etc, that are applicable (when replying 'YES', the specific recommendations should be in BGA 280 or pink pages and any deviations on listed the BGA SDMP 267 Tasks 101 plus.	YES		
Record of periodic reviews of the Aircraft Maintenance Programme (in accordance with M.A.302(g) or M.A.302(h)5, as applicable)				
5	Describe whether the review has resulted or not in changes to the Aircraft Maintenance Programme	Date and signature		
	None			

Annual Inspection Program

Airworthiness Review Certificate

Done Every Year

Airworthiness Directives

- Issued by Regulator in response to incident &/or manufacturers investigation
- Usually have an associated implementation schedule for a given glider type

Airworthiness Directives and BGA inspections

Airworthiness Directive or BGA inspection Number	Associated TN, TI, SB (optional)	Subject	* Method of compliance and date/reference	One time	Repeat	Next due
	890-1 31.01.2002	Airbrake control operation	Modified 25/3/2002	☒	☐	N/A
	890-2 13.2.2003	Hand operated rudder	Optional	☐	☐	N/A
2003-245/2	890-3 31.7.2003	Bonding of spar cap to spar web	Inspected 26/8/2003	☒	☐	N/A
	890-4 30.8.2004	removable aft stick	Optional	☐	☐	N/A
	890-5 15.2.2005	canopy locking mechanism	Modified 9/11/2006	☒	☐	N/A
	890-6 20.9.2005	Flight manual	Updated 10/1/2006	☒	☐	N/A
	890-7 17.2.2006	Retrofit of winglets	Optional	☐	☐	N/A
2006-0294E	890-8 22.9.2006	propeller hub has to be checked	Inspection/ overhauled @55hr on 11/2006	☐	☒	70hr 11/21
	890-9 12.6.2007	Increase of all up weight and NLP weight	Optional	☐	☐	N/A
	890-11 20.6.2007	Substition of nose wheel by a nose skid	Optional	☐	☐	N/A
2013-0054	890-13 05.3.2013	Amendment of flight and MM	Updated 2013	☒	☐	N/A
2015-0139R1	890-14- 13.7.2015	Airbrake bell crank at root rib of wings and drive funnels on fuselage side in the fuselage wing fairing	Inst 1&2 completed 2015	☒	☐	N/A
	890-15 10.7.2015	Revision of manuals	Updated 2019	☒	☐	N/A
2002-130/2 27.04.2002	-	SOLO Reinforcement of propeller bearing block	Modified 4/02/2002	☒	☐	N/A
	SB 4603-12	SOLO Front metering carburetor checked for resin debris. If found replace part	Inspected/ changed 31.2011	☒	☐	N/A
2019-0029	SB4603-18	Reduction gear block bearings and nut change	Replaced 15/1/2020 @61.77 engine hr	☐	☒	2035
	890-16	Airbrake endstop change	Replaced 11/11/20	☐	☒	N/A
				☐	☐	

AD Compliance statement:
All airworthiness Directives for airframe, engine, propeller and equipment (as applicable) have been reviewed and applied as required up to the following listings:

Lifed items (as applicable)

Item	Reference (MM or AD)	Interval	Last compliance	Next due	Life remaining
Example (Glider with 3500 hours and 5500 launches, nose release replaced at 3690 launches)					
Airframe life	*MM*	*12000 Hours*	*N/A*	*12,000 H*	*8500 H*
Airframe intermediate life inspection	*MM*	*3000 Hours*	*2950 H*	*5950 H*	*2450 H*
Nose release	*AD 1989-018/3*	*2500 Launches*	*3690 L*	*6190 L*	*690 L*
Airframe life	MM	12,000 hrs	N/A	12,000 hrs	9622 hrs
Airframe life intermediate life inspection	MM	6000 hrs	N/A	6000 hrs	3622 hours
Nose release	MM	3000 launches	N/A	3000 launches	2129 launches
C of G release	MM	3000 launches	N/A	3000 launches	2129 launches
Engine TBO	MM/TN	200hr	N/A	200hr	139hr
Propeller TBO	MM/TN	200hr or 5 years	@55hr on 2016	200hr or 5 years	194hr or 11 Months
Engine intermediate inspection	MM	25hr or 12 months	15.1.2020 @ 61.77hr	86.77hr or 15.1.2022	25hr or 12 months
Oxygen Cylinder	N/A	N/A	N/A	N/A	N/A
Propeller intermediate inspection	MM/TN	12 months or 25 hrs	2019	12 months or @86.33hr	12 months or 24.56hr
Schrof Harness	MM	12 years	January 2014	January 2026	5 years
Reduction gear bearings and nut change	AD 2019-0029 SB 4603-18	15 years	15/1/2020	15/1/2035	14 years
Weighing	MM	8 years	1/4/2017	1/4/2025	4 years

I certify that the above AD and Lifed item status report is complete and accurate to the best of my knowledge.

(Release unit and Engine requirements depending on model installed if applicable)

Name Craig Lowrie Signed: BGA Insp No: I/C/1388 Date: 13/1/21

Southdown Gliding Club

Pilot Owner Maintenance
What can a Pilot / Owner do themselves..?

- The pilot/owner is responsible for <u>any</u> maintenance they do
- They must satisfy themselves they are skilled enough
- They cannot do such maintenance on someone else's glider
- Any regular tasks should be included in the glider maintenance program
- Pilot owner must **<u>NOT</u>** attempt an item which :-

i. is critically safety related, whose incorrect performance will drastically affect the airworthiness of the aircraft or is a flight safety sensitive maintenance task and/or;
ii. requires the removal of major components or major assembly unless otherwise specified in the flight manual as a pilot task and/or;
iii. is carried out in compliance with an Airworthiness Directive or an Airworthiness Limitation Item, unless specifically allowed in the AD or the ALI and/or;
iv. requires the use of special tools, calibrated tools (except torque wrench and crimping tool) and/or;
v. requires the use of test equipment or special testing (e.g. NDT, system tests or operational checks for avionic equipment that is considered a maintenance or bench test) and/or;
vi. is composed of any unscheduled special inspections (e.g. heavy landing, ground loop or similar check) and/or;
vii. is effecting systems essential for the IFR operations and/or;
viii. is listed as a Complex Maintenance task i.e. major repair, or is a component maintenance task i.e. instrument repair.

Questions…?