DUBLIN
GLIDING CLUB

Human Factors in Gliding

Definition …

Human Factors (*aka* Human Performance)

The study of human performance and limitations pertaining to the piloting of aircraft, both in the air and on the ground

❑Ref.: AMC1 FCL.115; FCL.120; Acceptable Means of Compliance and Guidance Material to Part-FCL, Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

Syllabus …

- Basic Aviation Physiology & Health Maintenance
  - The Atmosphere
  - Respiratory & Circulatory Systems
  - Central, Peripheral & Autonomic Nervous Systems
  - Vision
  - Hearing
  - Equilibrium
  - Integration of Sensory Inputs
  - Illusions
  - Hygiene & Fitness
  - Body Rhythm & Sleep
  - Problem Areas for Pilots
  - Intoxication

Syllabus …

- Basic Aviation Psychology
  - Attention & Vigilance
  - Perception
  - Memory
  - Reliability of Human Behaviour
  - Error Generation
  - Decision Making Concepts
  - Safety Awareness
  - Communication
  - Personality & Attitudes
  - Identification of Hazardous Attitudes
  - Arousal
  - Stress
  - Fatigue & Stress Management

Introduction…

Aviation in itself is not inherently dangerous, but to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect.

Introduction …

- An understanding of our limitations as human beings in the aviation environment is just as important as an understanding of the limitations of the aircraft and the air that we fly in, to make our sport as safe as we possibly can.

- > 75% of all aviation accidents have a significant "Human Factors" element

Aviation Physiology

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Evolution

Human beings have evolved to live in conditions:

- ❑At, or close to, sea level,
- ❑At moderate temperatures,
- ❑Of good visual orientation, (with inner ear support in poor visibility)
- ❑Where movement is relatively slow,
- ❑Of 1g

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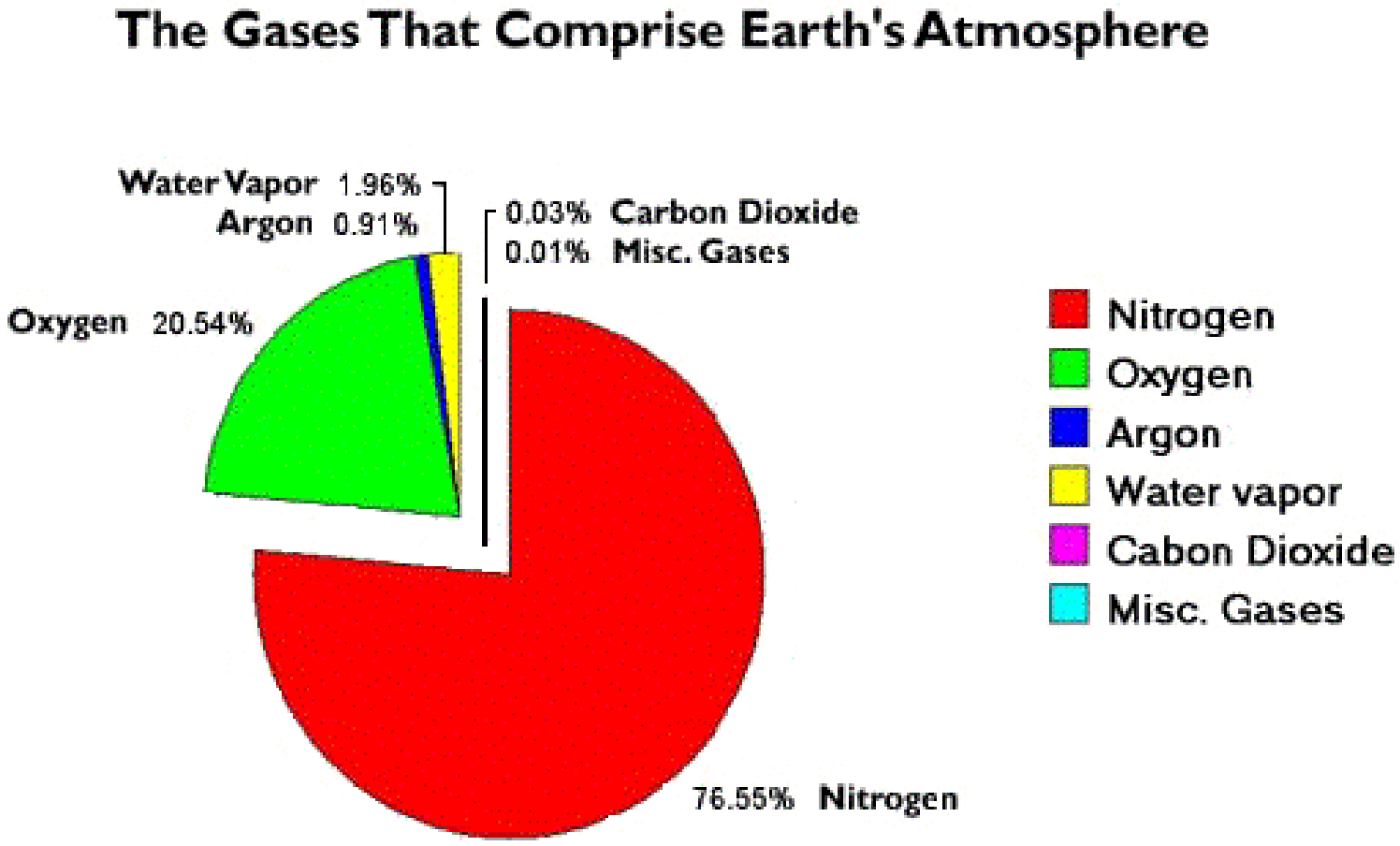
Flight

Human beings fly in conditions:

- ❑Substantially higher than sea level,
- ❑At moderate to sub-zero temperatures,
- ❑Of good to poor or none visual orientation, (with very poor inner ear support in poor visibility)
- ❑Where movement is anywhere from relatively slow to extremely fast,
- ❑Of >1g & <-1g

Basic Aviation Physiology & Health Maintenance…
The Atmosphere



Basic Aviation Physiology & Health Maintenance…
Gas Laws

Boyle's Law

$$V = {}^{k}/_{P}$$

i.e. When Pressure decreases, Volume increases

Atmospheric Pressure:

Pressure at Sea-Level =	**14.8psi =**	**1,013 hPa**
Pressure at 18,000' =	**7.4 psi =**	**506 hPa**
Pressure at 34,000' =	**3.7 psi =**	**203 hPa**

Basic Aviation Physiology & Health Maintenance…
Respiratory & Circulatory Systems

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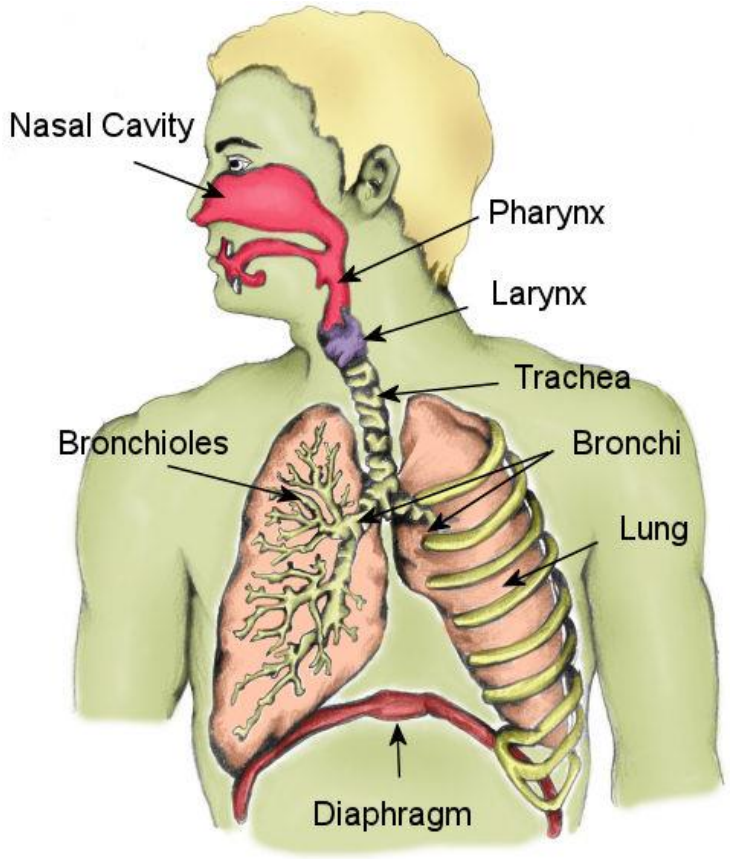
Human life depends on a continuous supply of oxygen to our tissue cells to sustain aerobic metabolism.

Tissues have no storage system for oxygen. They rely on a continuous supply of oxygen at a rate that precisely matches the body's changing metabolic requirements.

Reduced oxygen delivery and a consequent failure of the cellular use of oxygen can occur in various circumstances and if not recognised can result in organ dysfunction and death.

If this supply fails, even for a few minutes, Hypoxia may develop.

Basic Aviation Physiology & Health Maintenance…
Respiratory & Circulatory System



Oxygen transport from the environmental air to the individual cells occurs as a series of steps.

The heart, lungs, and circulation extract oxygen from the atmosphere and generate a flow of oxygenated blood to the tissues to maintain aerobic metabolism.

At the tissue level, cells extract oxygen from the extracellular environment and use it efficiently.

Basic Aviation Physiology & Health Maintenance…
Respiratory & Circulatory Systems

Sea level	**Oxygen partial pressure =**	**200 hPa**
18,000'	**Oxygen partial pressure =**	**<80 hPa**

Oxygen, mixed with water vapour, is diffused from the inhaled air into arterial blood.

In the blood, oxygen is bound to haemoglobin, a protein in red blood cells.

In peripheral tissues, the oxygen again diffuses into cells, where it is used to produce energy.

The binding capacity of haemoglobin is influenced by the partial pressure of oxygen in the environment.

Basic Aviation Physiology & Health Maintenance…
Hypoxia

Hypoxia:

- Is Insidious
- Results in a very limited Time of Useful Consciousness

Time of useful consciousness		
Altitude	Sitting	Moderate Activity
18,000 ft	20 - 30 mins	10 – 15 mins
21,000 ft	10 mins	5 mins
25,000 ft	3 mins	2 mins
28,000 ft	1½ mins	1 min
30,000 ft	1¼ mins	45 secs
35,000 ft	45 secs	30 secs
40,000 ft	30 secs	18 secs
43,000 ft	15 secs	9 secs

Basic Aviation Physiology & Health Maintenance…
Hypoxia

Symptoms and effects of Hypoxia

General

- Euphoria
- Target fixation
- Personality changes
- Loss of self criticism, judgement
- Fuzziness (not dizziness)
- Amnesia
- Lethargy
- Mental confusion
- Sensitivity to heat/cold
- Cyanosis (bluing of extremities)
- Unconsciousness
- Death

Neuro Muscular

- Clumsiness
- Fine Tremor
- Slurring of speech
- Slow movements
- Hypoxic flap

Visual

- Decrease in colour perception
- Decrease in peripheral awareness
- Decrease in visual acuity (dimming)

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What does this mean for pilots?

"No flights shall be carried out above 12,000 ft. unless serviceable oxygen equipment is carried on board and is available to all occupants" (IGSA)

"For flights above 10,000 ft. amsl, all pilots are recommended to use a supplementary oxygen supply with a visible contents gauge.
In the event of illness in the air for any cause, a descent should be made to below 10,000 ft. amsl." (BGA)

Oxygen is mandatory for more than 30 minutes flight between FL100-FL130 and at any time above FL130 (UK ANO)

Basic Aviation Physiology & Health Maintenance… Hypoxia

Hypoxia : An Insufficiency of Oxygen in the body tissues.

Hypoxic Hypoxia: This refers to Hypoxia resulting from an inadequate saturation of blood oxygen due to a **reduced supply of oxygen in the air**. With this type of hypoxia, the partial pressure of oxygen in the arterial blood (paO^2) is lower than normal.

Anaemic Hypoxia: This refers to Hypoxia resulting from a situation whereby **the capacity of the blood to carry oxygen is reduced** and inadequate levels of oxygen are therefore circulated around the body.

Examples of causes of Anaemic Hypoxia include:

a) True anaemia, where the person's haemoglobin level is low
b) Carbon monoxide poisoning, which happens when the receptors which usually carry oxygen are blocked by carbon monoxide.

Basic Aviation Physiology & Health Maintenance…
Carbon Monoxide

Carbon Monoxide (CO) is a colourless, odourless, toxic gas produced when any carbon-based fuel is burned (e.g. Avgas)

Symptoms: Nausea, dizziness, weakness, muscle aches, vomiting, and a general weakness or sleepiness.

CO Countermeasures: Carbon monoxide detectors
Regular engine maintenance

Basic Aviation Physiology & Health Maintenance…
HyperVentilation

Hyperventilation: Rapid or deep breathing, which can be triggered by stress, anxiety, panic or anger

Cause: You breathe in oxygen and breathe out carbon dioxide - excessive breathing creates low levels of carbon dioxide in your blood.
This causes many of the symptoms of hyperventilation.

Symptoms:
Chest pain
Confusion
Dizziness
Light-headedness
Muscle spasms in the hands and feet
Numbness and tingling in the arms or around the mouth
Shortness of breath
Palpitations
Weakness

Fix:
Stay calm
Breathe shallowly, or close one nostril and breathe through your nose

Basic Aviation Physiology & Health Maintenance…
Pressure Changes

Boyle's Law: Gas pressure inversely related to volume.

i.e. Gas/air will expand as pressure drops with increasing altitude

Any gas or air trapped in :

- the stomach
- the intestines
- the middle ear
- the sinuses
- teeth

Will expand as you gain height; can cause severe pain in teeth/sinuses/ears.

Yawning or swallowing will relieve blocked ears.

Basic Aviation Physiology & Health Maintenance…
Pressure Changes - Nitrogen

Nitrogen: 80% of the atmosphere

Reduced air pressure at altitude allows Nitrogen to come out of solution in the bloodstream and organs – this can form bubbles, which are then free to move about the bloodstream and become lodged in the joints, the brain, spinal chord, and under the skin causing a variety of symptoms:

Symptoms:

- Joint pains
- Itchiness
- Numbness
- Tingling
- Paralysis of parts of the body
- Poor co-ordination and movement
- Mental confusion
- Visual disorders
- Inner ear problems
- Shortness of breath
- Tight or painful chest

Basic Aviation Physiology & Health Maintenance…
Pressure Changes - Nitrogen

Diving: Don't fly for at least 24 hours after diving

Treatment: Compression in a Compression Chamber as a matter of urgency

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Hypertension:

Every time the human heart beats, it pumps blood to the whole body through the arteries.

"Normal" Blood Pressure: 120/80 (Systolic / Diastolic, mmHg)

Hypertension, also referred to as high blood pressure, is a condition in which the arteries have a persistently elevated blood pressure.

Hypertensive BP: >140/90

Symptoms : None

Can Cause: Stroke / Heart Attack

DUBLIN GLIDING CLUB

Coronary Heart Disease:

The most common cause of heart attacks

Caused by a build up of plaque building up along the inner walls of the arteries of the heart, which narrows the arteries and reduces blood flow to the heart.

Causes:	Smoking High Cholesterol High Blood Pressure Diabetes
Early stage symptoms:	None
Mid-stage symptoms:	Heart failure, heart attack, Angina, breathlessness

Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision

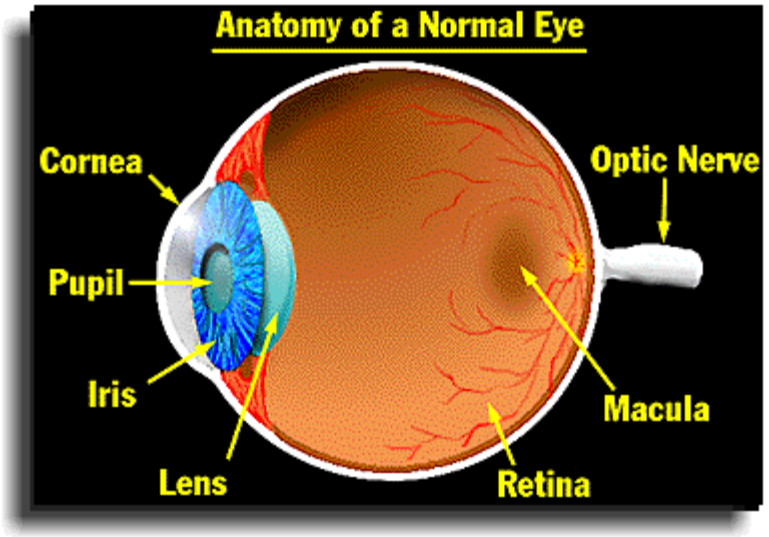
Good Eyesight: clearly essential
know how to use it effectively
understand its limitations
understand the situations in which it may let you down

The Eye – Functional Anatomy

Receptive cells on the retina (cones and rods) convert the incoming light signal into nerve impulses

Very sensitive to Oxygenation

Colour dimunition above 6,000'



Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision – The Blind Spot

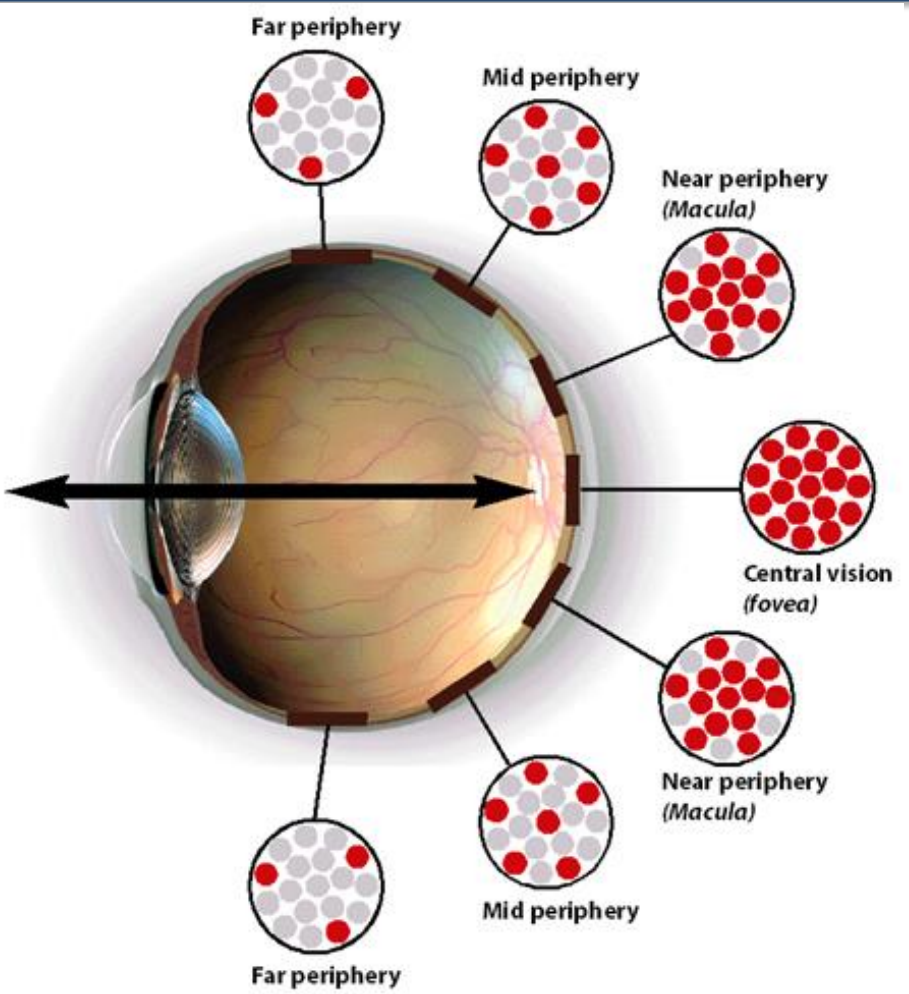
There are no rods/cones at the point where the optic nerve exits the eye.

This is known as "the blind spot" – located in the upper outer quadrant of the visual field of each eye.

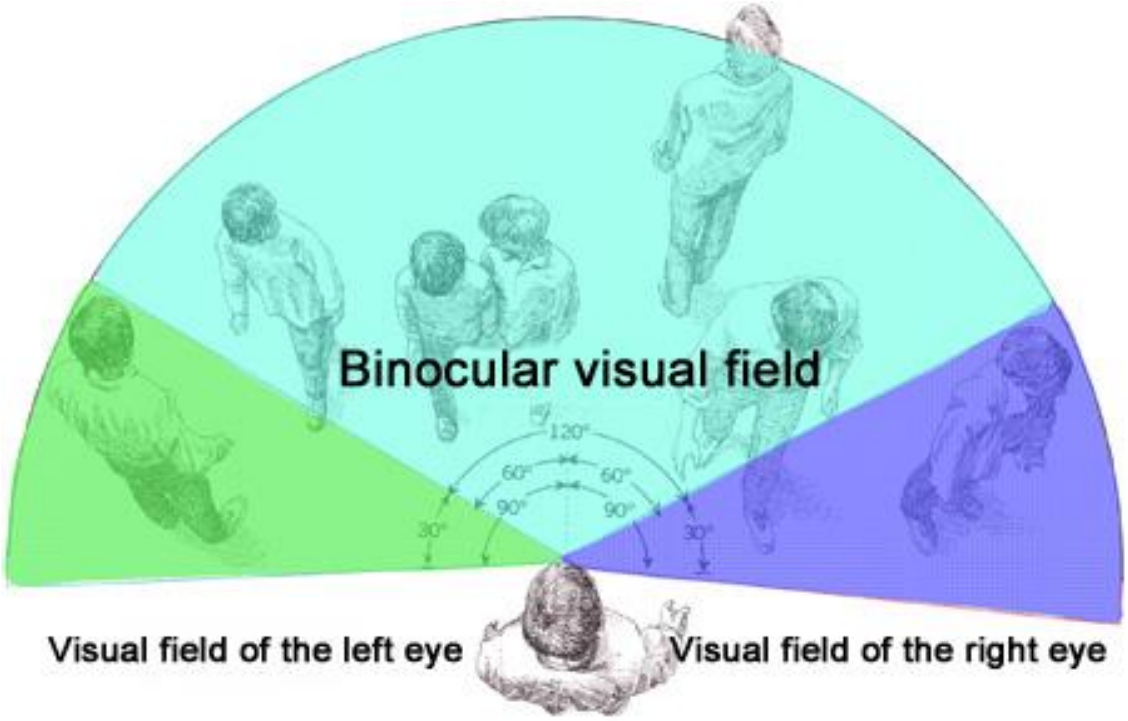
Normally, one eye makes up for the other, as the blind spots are in opposite quadrants in each eye.

E.g. an aircraft may be in the blind spot of one eye and be hidden from the other by a canopy arch . . . . . You just won't be able to see it.

Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision – Foveal & Peripheral Vision



Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision – Binocular Vision



1 Spare Eye – very useful
2 Stereo Vision
3 Wider Field of view
4 Binocular summation (faint objects)

Poor or no vision in one eye

Can be adapted to when present from a young age

Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision– Rods & Cones

Rods: React to weaker light levels
Black & white only
Mainly on the periphery of the retina
Detect movement well

Cones: Detect Colour
Good at detecting fine detail
Reside mostly in the Macula

Macula: Effective through an angle of approx. 20°

Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision– Scanning

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The Scan

Divide the scan into 20° segments – about 2 seconds per segment

[Objects are less distinct when scanned through]

- **Ahead**
- **Into turns**
- **Below & around for HASAL checks**

- **Empty Field Myopia**
  - **The eye settles to a focus about 4m away in the absence of any distinct visual clues – eg at height on a blue day**
  - **Consciously refocus your eyes to near and far points.**

Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Vision– Scanning

Process		Time Taken	Time Lapse
Looking	Is there something out there?	0.2 seconds	0.2 seconds
Seeing	Yes, there is definitely something out there	0.3 seconds	0.5 seconds
Recognising	It is another glider – a K21!	1.0 seconds	1.5 seconds
Evaluating	It is coming this way – I need to turn, NOW!	3.0 seconds	4.5 seconds
Responding	Manoeuvring to avoid the collision	3.0 seconds	7.5 seconds

Constant Angle

Two aircraft on a collision course will be seen by each other as stationary objects

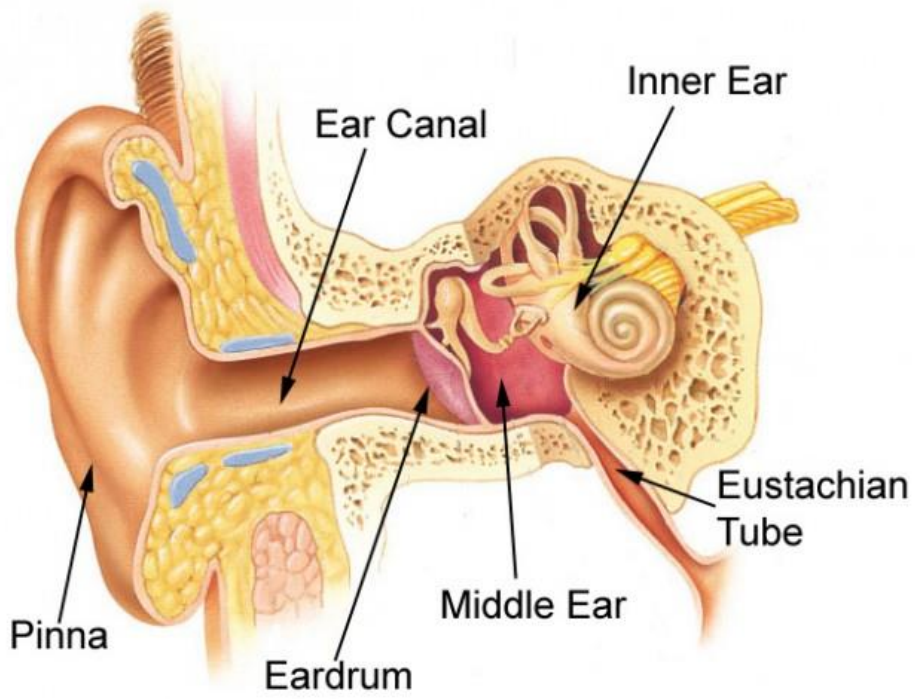
Constantly weave & bank to ameliorate this.

The application of positive “g” forces will reduce the blood supply to the brain and therefore the oxygen supply to the brain will be diminished.

Initially the pilot may notice:

- loss of colour (“grey out”)
- loss of peripheral vision (tunnel vision)
- blurring of vision (loss of visual sharpness)
- total loss of vision (“black out”)

Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Hearing



Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Hearing

Flight related hazards to hearing:

- **Engine Noise**
- **Altitude-change**

Hearing Loss:

- **Genetics**
- **Aging**
- **Exposure to noise**
- **Illness**
- **Chemicals**
- **Physical trauma**

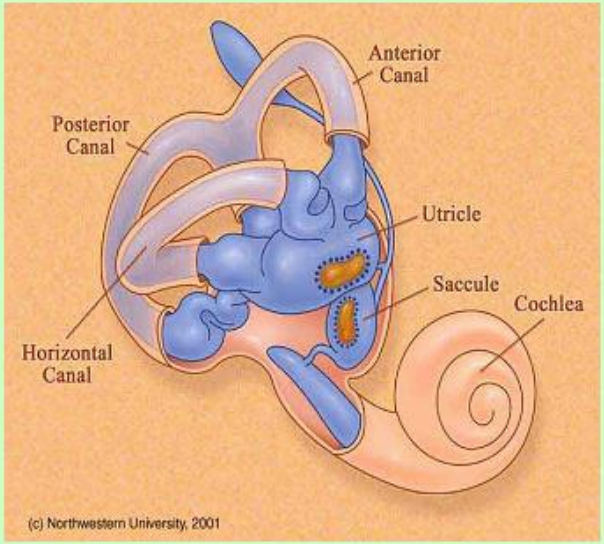
Person and Environment
Central, Peripheral & Autonomic Nervous Systems
Equilibrium

Balance:
3 x Orthogonal Semi-Circular Canals

Acceleration:
Utricle & Saccule

The Vestibular System

- Function:
  - Sense angular and linear acceleration or deceleration using five separate sensory receptors on each side of the head.
  - Sense head position relative to gravity.
  - Maintain visual fixation ability during motion.



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Airsickness

Airsickness is a specific form of motion sickness, and is considered a normal response in healthy individuals.

Airsickness occurs when the central nervous system receives conflicting messages from the body (including the inner ear, eyes and muscles) affecting balance and equilibrium.

Airsickness is usually a combination of spatial disorientation, nausea and vomiting

DUBLIN GLIDING CLUB

Spatial Disorientation

Disbelief about what is being felt / experienced.

Linear Disorientation

Misinterpretation of Acceleration/Deceleration cues

Angular Disorientation

<2°/s/s cannot be detected (ie after 30 seconds in cloud, your glider may, unknowingly, be turning at 60°!)

Cloud Flying

Spinning

Illusions

A visually perceived image that is different to objective reality

Physical

Creates an image that is different from the object that "makes" it – e.g. a mirage

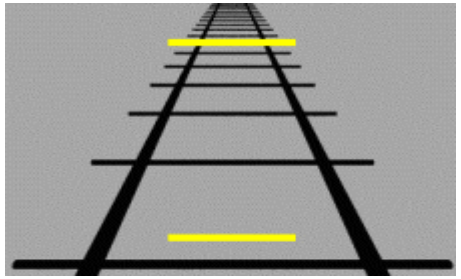
The Blind Spot – you will be unable to see an a/c in your blind spot if the other eye's corresponding "blind spot" is blocked

Physiological

Excessive stimulation of the eyes of a specific type e.g. brightness, colour, size, position, tilt, movement, etc.

Psychological

Unconscious Inferences



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Landing at an airfield with differently sized surroundings:

Landing at a longer runway
Tendency to approach high

Landing at a shorter runway
Tendency to approach low

Landing up-slope
Tendency to approach low

Landing down-slope
Tendency to approach high

DUBLIN GLIDING CLUB

Human Circadian Rhythm:

- Duration: 24 hours
- Subject to external stimuli (e.g. daylight, darkness)
- Temperature compensated

Disturbing your circadian rhythm can have the following serious negative impacts.

- Jet lag
- Fatigue
- Disorientation
- Isomnia.

Health & Hygiene
Problem Areas for Pilots

- Common Minor Ailments (cold, flu etc)
- Entrapped gases
- Obesity
- Food hygiene
- Infectious Diseases
- Nutrition
- Toxic gases (Carbon monoxide)

Health & Hygiene
Intoxication

- **Prescribed Medication**
- **Alcohol & Drugs**
- **Self-Medication**

Health & Hygiene
Temperature Considerations …

Heatstroke: Occurs when the body's internal temperature control system gets overloaded

Caused by: High Temperature / Humidity
Dehydration

Can Cause: Disorientation
Confusion
Hallucinations
Collapse
Death

Health & Hygiene
Temperature Considerations …

Heatstroke Symptoms:

- Heat rash
- Muscle cramps
- Headache
- Nausea (and vomiting)
- Dryness of mouth, nose and eyes
- General dehydration
- Poor concentration
- Drowsiness
- Weakness
- Lethargy
- Slurred speech
- Confusion
- Disorientation
- Hallucinations
- Total collapse (or, in extreme cases death)

Health & Hygiene
Temperature Considerations …

Heatstroke Precautions:

- Ensure that you are fit and hydrated.
- Wear a sun hat
- Attempt to control the environment with good ventilation and sensible clothing.

Dehydration Precautions:

- Frequent intake of suitable cool fluids (at least 250ml/hour – 500 on a very hot day!)
- Wear a hat!

Aviation Psychology

Basic Aviation Psychology
Human Information Processing

- **Attention & Vigilance**

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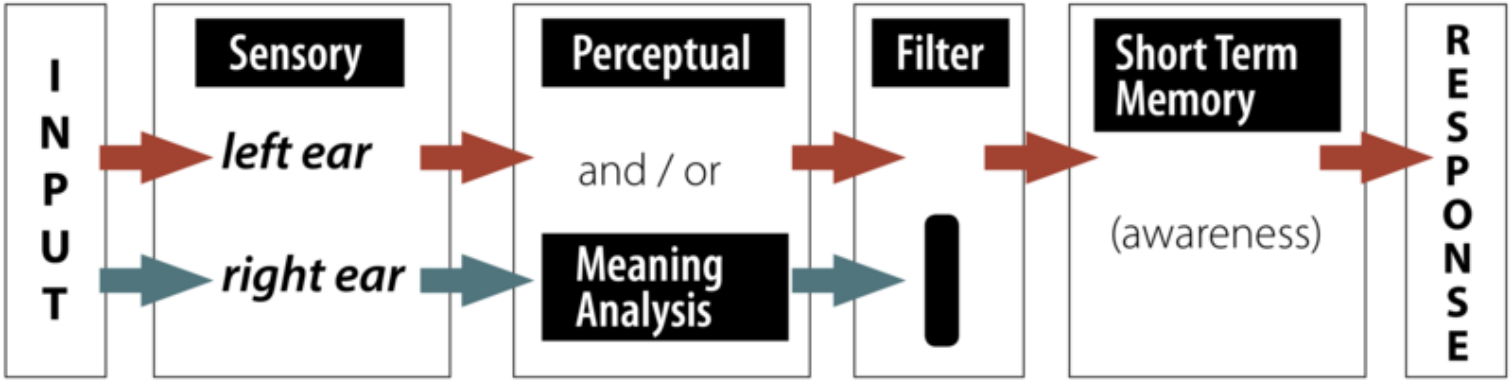
Selective Attention



Basic Aviation Psychology
Human Information Processing

Divided Attention

DUBLIN GLIDING CLUB

Memory

- Sensory Memory
  - Very Short Term (< 3 seconds)
  - < 12 objects
  - Automatic
  - Visual, Audio, Touch
  - Prone to error
- Working Memory
  - < 1 minute
  - 4 – 5 objects
  - Automatic
  - Visual, Audio, Touch
  - Improved by the use of Mnemonics – CBSIFTCBE, etc.
- Long Term Memory (includes Motor Memory)
  - Long Term (lifetime)
  - Infinite amount of “objects”

Muscle Memory

The tendency (in some stressful situations) to reach automatically and erroneously for a control that may be in an unfamiliar condition,

Such as:

adjusting the flaps rather than the airbrakes, or

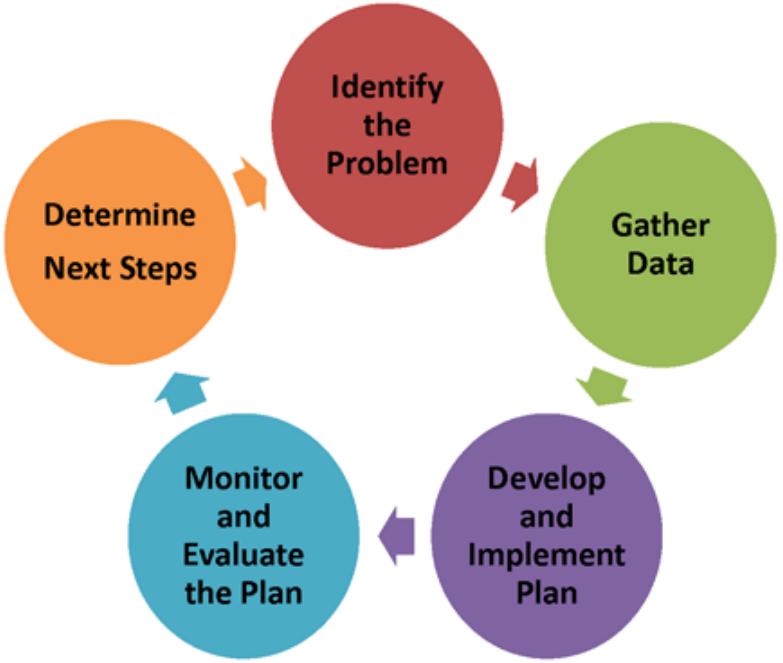
opening the canopy rather than releasing the towrope . . . .

Basic Aviation Psychology
Human Behaviour, Error and Reliability

Behaviour and attitudes which affect judgement and decision making:

- **Anti-Authority**
  - **A feeling of resentment at being told what to do**
- **Impulsiveness**
  - **The urge to do something immediately, without insufficient thought to possible outcomes**
- **Invulnerability**
  - **"It'll never happen to me . . ."**
- **Machismo complex**
  - **Conceit, arrogance, exaggerated sense of ability**
- **Resignation**
  - **The tendency to avoid making a difficult decision, underconfidence, fatalism**
- **Complacency**
  - **A reduced awareness of real danger; overconfidence**

Decision Making:



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Risk Awareness and Assessment

"If you are looking for perfect safety, you will do well to sit on a fence and watch the birds"

Wilbur Wright 1901

Risks are associated with:

- The pilot
- The aircraft
- The environment/operation

DUBLIN GLIDING CLUB

Risk Area Awareness

Having sufficient knowledge of what you're doing to be able to make a balanced judgement about the risks involved… What they are, Where they are, etc.

Situation Awareness:

"The perception of elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status into the near future"

aka…

"knowing what is going on so you can figure out what to do"

The Dirty Dozen …

- Poor Communication
- Complacency
- Lack of Knowledge
- Distraction
- Lack of teamwork
- Fatigue
- Lack of resources
- Pressure
- Lack of Assertiveness
- Stress
- Lack of awareness
- Norms

Poor Communication …

Good Communications should be:

- Clear
- Short
- Relevant
- Accurate

Complacency …

A feeling of self-satisfaction accompanied by a loss of awareness of potential dangers.

Normally caused by:

- Boredom
- I've done this for the last 25 years …
- Reduced human performance.

Expect the unexpected!

Lack of Knowledge …

ASK !

Distraction …

Anything that draws a person's attention away from the task on which they are employed

Complete your task before responding.

When returning to a task, after being distracted, it is a good idea to commence at least three steps back.

E.g., daily inspections, cockpit checks - try not to interrupt!

Lack of Teamwork …

Good Teamwork:

- Have a clearly defined and maintained aim
- Each team member's roles and responsibilities are clearly understood
- Communication messages and methods are clearly understood
- Limitations and boundaries clearly defined
- Emergency procedures known to all
- Individual expectations and concerns clear to all

Fatigue …

Reduces:

- ability to concentrate
- ability to remember
- ability to make decisions

Fatigue can make you:

- distracted
- more withdrawn
- irrational
- angry
- lose situational awareness.

Fatigue …

We tend to underestimate our level of fatigue and overestimate our ability to cope with it.

Fixes:

- Long-term: Regular sleep, a healthy diet, exercise.

- Short-term (on the day, at the airfield):
  - Keep warm – hat, gloves, scarf, extra socks. Getting chilled uses up energy.
  - Bring enough food and water and make sure you eat and drink BEFORE getting too thirsty/hungry/tired.
  - Take breaks as needed.
  - Never be afraid of saying you are too tired to continue flying/instructing/tugging.

Lack of Resources …

When the proper resources are available, there is a greater chance that we will complete a task:

- more effectively
- correctly
- safely
- efficiently

Pressure …

Pressure is normal in a dynamic environment

However, when the pressure to perform interferes with our ability to complete a task correctly, then it has become excessive

Pressure can be created by:

- lack of resources
- lack of time
- our own inability to cope with a situation

Fix: Learn Assertiveness skills

Lack of Assertiveness …

Assertiveness is a communication and behavioural style that allows us to express feelings, opinions, concerns, beliefs and needs in a positive and productive manner.

Unassertive team members can be forced to go with a majority decision, even when they believe it is wrong and dangerous to do so.

When we are assertive we also invite and allow others to assert themselves without feeling threatened or undermined or feel that we've lost face.

Lack of Assertiveness …

Speaking one's mind:

- communicate directly,
- communicate honestly,
- communicate with respect, but without compromising your own standards.
- communicate calmly, rationally and specifically
- criticise actions and outcomes rather than people

Examples:
"When you hold the glider's port wing on take-off, the tug-pilot cannot see your signal – so it's best to hold the starboard wing." (NOT "You eejit, hold the other wing")

"Stop! ….OK, push gently back now, we are very close to the hangar wall here." (NOT "Um…um…just a sec…I think….crash!)

Stress …

Typically in the aviation environment there are two distinct types:

Acute Stress

Chronic Stress

Stress …

Acute Stress

Places real-time demands placed on our senses, mental processing and body

Dealing with Stress:

- Breathing & Relaxation exercise
- Open channel of communications
- Diet
- Keep physically fit and healthy
- Eat well
- Rest well
- Relax well
- Sleep well
- Know your capabilities and keep within them
- Think and plan ahead
- Prioritise
- Delegate and load shed
- Seek assistance where necessary
- Avoid procrastinating

Stress …

Workload (i.e. Mental Capacity)

Learning a new activity requires almost total concentration
– this leaves little excess brainpower to handle any unexpected incident (just ask any instructor . . .)

As experience is gained, routine tasks become semi-automatic, leaving sufficient attention to handle non too demanding additional tasks
In emergency situations, a superfluity of information (often some of it apparently contradictory) is thrust at the unfortunate pilot, resulting in some basic task (e.g. flying the aircraft!) shedding…..

Which may well result in an accident …

Stress …

Workload (i.e. Mental Capacity)

Always fly inside the following parameters:

- Your own skills as a pilot
- The performance of the glider that you're flying
- The influence of external factors (e.g. the weather)

Stress …

Remember:

- **A**viate
- **N**avigate
- **C**ommunicate

Stress …

Chronic Stress

Accumulated stress which results from long-term demands such as:

- family relations
- finances
- illness
- bereavement
- divorce

Stress from these persistent and long-term life events can mean that our threshold of reaction to demands and pressure at work can be lowered.

Signs:

- changes in personality and moods
- errors of judgement,
- lack of concentration
- Poor memory
- difficulty in sleeping
- Fatigue
- susceptibility to infections,
- increased use of stimulants and self-medication
- absence from work
- illness
- Depression

Fix: Lifestyle Change

Lack of Awareness …

Lack of Awareness refers to working in isolation and only considering one's own responsibilities

Can lead to:

- tunnel vision
- a partial view
- a lack of awareness of the affect our actions can have on others

Develop the habit of:

- Asking "What if"?
- Asking others to check what we're doing
- Asking others to challenge our decisions
- Vigilance
- Situational Awareness
- Scanning

Norms …

The Way We Do Things Around Here……

Norms (Practices) develop:

- over time
- through experience
- under the influence of a specific culture

Practices can be:

- Good
- Bad
- Safe
- Unsafe

Be open to the idea that just because we've always done X in manner Y which usually results in outcome Z, that there might just possibly be a better way of doing it . . . .

Basic Aviation Psychology
Personality …

Personality Development: Personality emerges early and continues to change in meaningful ways throughout life

Personality Traits

Openness to experience: (*inventive/curious* vs. *consistent/cautious*).
The extent to which a person is imaginative or independent,

Conscientiousness: (*efficient/organized* vs. *easy-going/careless*).
A tendency to be organized and dependable,

Extroversion: (*outgoing/energetic* vs. *solitary/reserved*).
Energy, positive emotions, assertiveness, sociability, talkativeness.

Agreeableness: (*friendly/compassionate* vs. *analytical/detached*).
A measure of whether a person is generally well tempered or not.

Neuroticism: (*sensitive/nervous* vs. *secure/confident*).
Neuroticism refers to the degree of emotional stability and impulse

Personality …

THE IDEAL PILOT:

- ❑Consistent
- ❑Dependable
- ❑Flexible
- ❑Safe
- ❑Knowledgeable
- ❑Accurate
- ❑Confident
- ❑Reliable
- ❑Makes good decisions
- ❑Learns from experience
- ❑Knows, and does not exceed, his, or her, limitations
- ❑Sets good example
- ❑Is always trying to improve

Safety Culture …

Risk is inherent to all flying, including gliding

- ❑ **Continuously assess the risks**
- ❑ **Seek ways to eliminate or reduce them**
- ❑ **Assess whether the results justify the risks**
- ❑ **Everyone has the responsibility to improve safety**

I'm Safe …

- **I**llness
- **M**edication
- **S**tress
- **A**lcohol / Drugs
- **F**atigue
- **E**ating

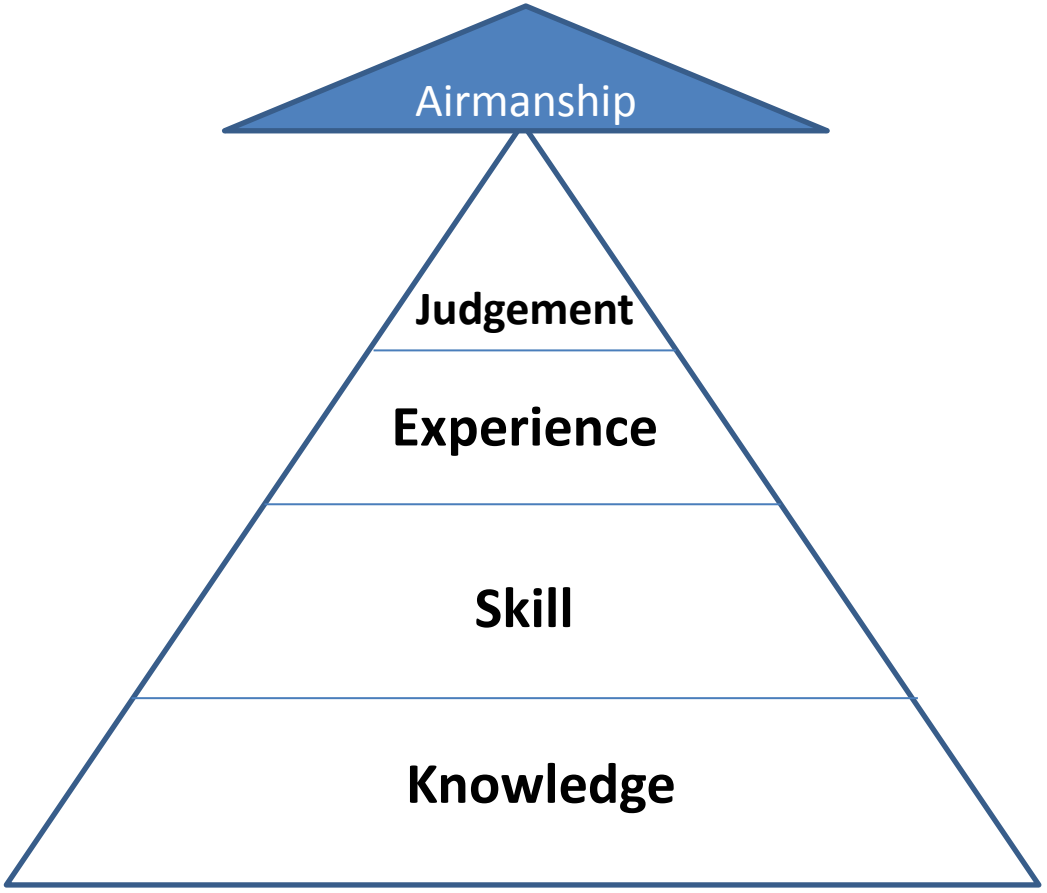
Airmanship …

Good Airmanship is the display and application of :

- ❑Common Sense
- ❑Good Aviation Practice
- ❑High Standards

While in the air **and** on the ground

Airmanship …



Remember …

A pilot who has developed superior skill and good judgement will use his good judgement to minimise the need to use his superior skill …

And finally . . . .

"If you want to grow old as a pilot, you have to know when to push it and when to back off"

- General Chuck Yeager (1923 -), USAF,
  1st pilot to break the sound barrier.

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Thank You!