

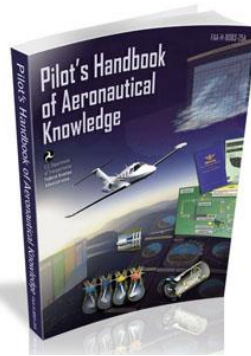
# **PRIVATE PILOT STAGE CHECK ORAL GUIDE**

**(REVISION I)**

# REFERENCES



**FAR/AIM**



**PHAK**



**AC 00-45G**

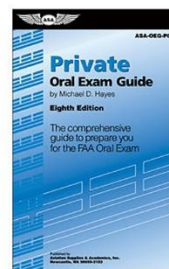


**AC 00-6A**



**POH**

## RECOMMENDED READINGS



## Certificates and Documents

**What documents must you have with you to fly the airplane? (61.3)**

Pilot certificate, medical certificate, and government issued photo ID

\*as a student pilot, these documents in addition to your logbook (to show endorsements) are only required when acting as PIC (solo flight)

**What are your limitations as a student pilot? (61.89)**

1. No passengers
2. Cannot carry property for compensation or hire
3. Cannot fly in furtherance of a business
4. Cannot fly with a flight or surface visibility of less than 3sm during the day and 5sm at night and flight must be made with visual references to the surface.

**What privileges and limitations apply to private pilot? (61.113) (91.146)**

Privileges – Act as PIC and carry passengers – conduct search and rescue operations; fly for charitable, non-profit, or community event; act as an aircraft salesman if you have at least 200 hours.

Limitations – Cannot fly for hire; must pay no less than pro rata share

**Do you need to take your logbook with you? (61.51)**

Only as a solo student pilot on a cross country flight

**What type of pilot certificate do you have? Does it expire? (61.19)**

Under 40, a student pilot certificate expires **after 60 calendar months**

Over 40 it expires after 24 calendar months

PPL, CPL, CFI, Ground Instructors, and ATP certificates are issued without an expiration date.

## How do we keep our pilot certificate current? (61.56, 61.57)

Student pilot: with valid medical certificate

PPL: Flight review every 24 calendar months

## What are the currency requirements for carrying passengers? (61.57)

3 take offs and landings within the preceding 90 days in an aircraft of the same category, class and type if required. At night, these 3 landings must be made to a full stop.

## Night definition? When can you perform required night landings? (1.1, 61.57)

Night = the time between evening civil twilight and morning civil twilight

Night landings can be logged 1 hour after sunset to 1 hour before sunrise.

## How long is a medical certificate valid for? (61.23)

### Under 40

Months	12	24	36	48	60	
First Class Certificate Granted	First Second and Third Class	Third Class	▶	▶	▶	Expired
Second Class Certificate Granted	Second and Third Class	Third Class	▶	▶	▶	Expired
Third Class Certificate Granted	Third Class	▶	▶	▶	▶	Expired

### 40 and Older

Months	6	12	24
First Class Certificate Granted	1st, 2nd, 3rd	2nd, 3rd	Third Class
Second Class Certificate Granted	2nd, 3rd		Third Class
Third Class Certificate Granted	Third Class		▶
			Expired

**What documents should be in the aircraft before flight? ARROW (91.9, 91.203)**

Airworthiness Certificate

Registration

Radio License (required for international flight)

Operating Limitations (found in the POH)

Weight and Balance equipment list

**When will an aircraft registration certificate expire? (PHAK 8-6)**

3 years

**Which weight and balance information must be in the aircraft, the one on the takeoff data card or the one in the airplane flight manual?**

Updated weight and balance equipment list in the AFM

**With respect to the certification, privileges, and limitations of airmen, what do category, class, and type mean? (61.5)**

Category: Airplane, Rotorcraft, Glider, Lighter-Than-Air etc.

Class: Single Engine Land/Sea, Multi Engine Land/Sea

Type: specific to aircraft – only required for aircraft with a max gross weight equal or greater than 12,500lbs, turbojet, or any aircraft specified by the FAA to require one **(61.31)**

**If a pilot changes his permanent mailing address, how long can the pilot continue to exercise the privileges of their pilot certificate without notifying the FAA? (61.60)**

30 days

### **Airworthiness Considerations**

**Does an Airworthiness Certificate ever expire?**

Not as long as inspections are kept up to date and manufacturer's original design is adhered to

**Does the POH meet the requirement of having an AFM? (PHAK 8-2)**

Yes. The POH for most light aircraft built after 1975 is also the FAA designated AFM.

**Who says we have to follow the POH? (91.9)**

FAR 91.9 states, "...no person may operate a civil aircraft without complying with the operating limitations specified in the approved Airplane or Rotorcraft Flight Manual..."

**Who is responsible for ensuring an aircraft is maintained in an airworthy condition?**

**(91.403)**

The owner/operator

**Discuss AVIATES. Required Inspections**

**Annual – every 12 calendar months (91.409)**

**VOR – every 30 days for IFR (91.171)**

**100** hour if airplane is being operated for hire

**Altimeter/Pitot Static** – 24 calendar months; required for IFR flight **(91.411)**

**Transponder** – 24 calendar months **(91.413)**

**ELT** – 12 calendar months or after 1 hour cumulative use or half of battery life **(91.207)**

**Service bulletins and ADs** complied with

**What is an Airworthiness Directive? Is it mandatory? (PHAK 8-12)**

FAA issued order to fix a known issue. It is mandatory.

**What different kinds of AD's are there?**

Emergency – These require immediate compliance before flight

One Time – After the AD is complied with once, there is no further need to address the specified issue

Recurring – This AD must be complied with at the specified interval.

**Can you over fly an annual? 100 hour? (91.409)**

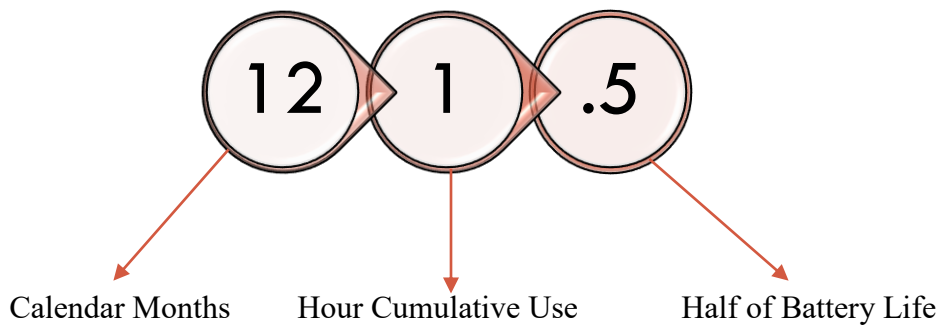
The only way to overfly an annual is to obtain a special flight permit from the FSDO.

A 100 hour inspection may be overflowed by no more than 10 hours and **only** if enroute to the place where the inspection will be done. An annual inspection can be substituted for the 100 hour however, a 100 hour cannot substitute an annual inspection.

**Do you need to have an ELT in the airplane today? (91.207)**

Not needed for training within 50 nm of home airport

**When does an ELT battery have to be replaced or recharged? (91.207)**



What equipment and instruments do you need to have in the airplane for today's flight?

**ATOMATOF LAMES (91.205b)**

**A**ltimeter

**T**achometer

**O**il temperature gauge

**M**agnetic compass

**A**irspeed Indicator

**T**emperature gauge (for liquid cooled engines)

**O**il pressure

**F**uel quantity gauge

**L**anding gear position indicator (for retractable landing gear)

**A**nti-collision lights – Aviation red or white (e.g. red rotating beacon or white strobes)

**M**anifold pressure gauge (for airplanes with a constant speed propeller)

**E**LT



Seatbelts

**How about if you were to fly tonight? FLAPS (91.205c)**

Fuses 3 of each kind or 1 complete set

Landing light if airplane is being flown for hire (including flight training)

Anti-collision lights

Position lights – Also called navigation lights – red on the left side, green on the right and white on the tail

Source of electricity – Battery or alternator

**What would you do if you found that the landing light was inoperative? (91.213)**

Cannot fly at night per the FARs – During the day you would deactivate or remove the component and placard it inoperative (deactivating could be as simple as pulling the circuit breaker out)

**Can you fly an airplane with known inoperative equipment?**

Yes, if it is not included in 91.205 and it has been deactivated/removed and placarded inoperative

**What is a Minimum Equipment List? (PHAK 8-9)**

An FAA approved list of equipment that can be inoperative

**Do we have one? What do we have?**

No. We adhere to the regulations in 91.205 and 91.213 (d)

**Can an aircraft owner change an MEL?**

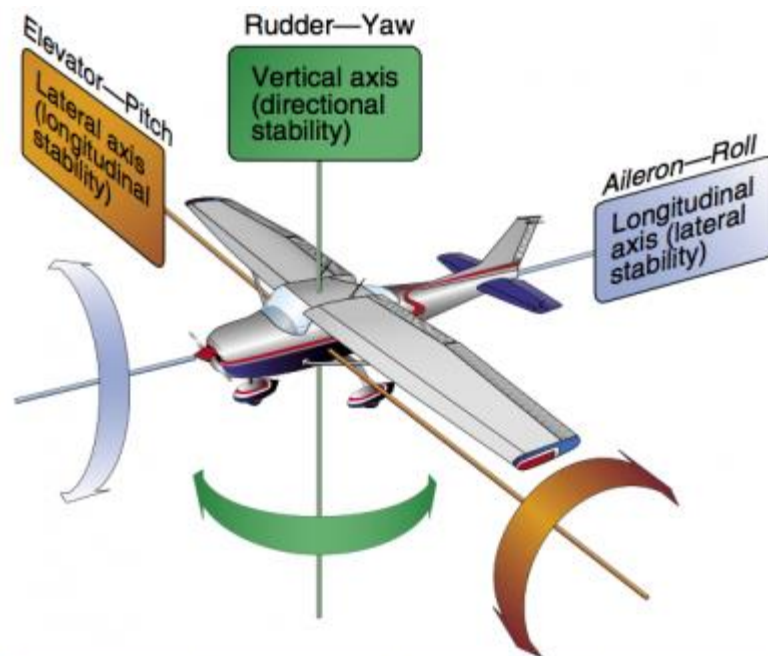
If a change is sought, a letter and a proposed MEL that is based off of the Master MEL must be sent to the FAA for approval

## Performance and Limitations

What are the four forces of flight?

Lift Weight Thrust Drag

What are the primary flight controls? (PHAK 5-3)



Primary Control Surface	Airplane Movement	Axes of Rotation	Type of Stability
Aileron	Roll	Longitudinal	Lateral
Elevator/Stabilator	Pitch	Lateral	Longitudinal
Rudder	Yaw	Vertical	Directional

What are the secondary flight controls? (PHAK 5-8)

Flaps, leading edge devices, spoilers, and trim systems (anti-servo tab)

### **How is lift created? (PHAK 3-4)**

Newton's 3<sup>rd</sup> law - Airfoils accelerate airflow downward. The equal and opposite reaction as described by Newton forces the airfoil upwards.

Bernoulli's Principle – As the velocity of a fluid or gas increases the pressure decreases. High speed air over the upper surface creates low pressure area while comparatively lower speed air beneath the wing creates high pressure which produces an upwards force that contributes to the total lift.

### **Explain the different types of drag.**

Parasite – **increases with speed**

Some types of parasite drag include form, skin friction, and interference drag.

Form drag is caused by the shape of the aircraft and the airflow around it. Anything that sticks out from the fuselage as well as the fuselage itself contributes to this (e.g. antennas, pitot mast, engine cowling)

Skin friction drag is caused by air slowing down as it moves across the surface of the aircraft.

Rivets, dirt, or anything that makes the surface less smooth adds to this type of drag.

Interference drag is caused by intersecting airstreams from different parts of the aircraft. Take, for example, the area where the wing is attached to the fuselage. Since the wing accelerates the relative wind, this airstream will be relatively faster than the wind moving over the fuselage.

When these two airstreams meet, turbulent eddies form and this produces drag.

Induced – **byproduct of lift, decreases with speed**

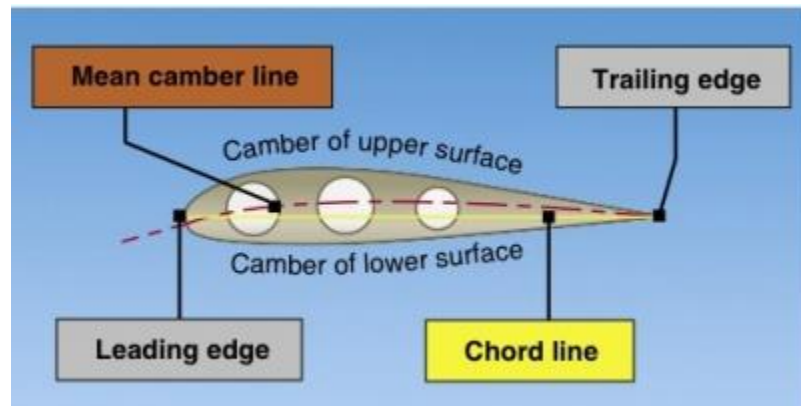
High pressure airflow from beneath the wing has the tendency to spill over the wingtips to equalize the lower pressure above. When this happens, turbulent whirl pools called wingtip vortices form and create drag. Also, any time the angle of attack is increased, a portion of the wing's lift vector is angled backwards. This too creates more induced drag.

**What is the airspeed where Induced and Parasite drag meet?**

$V_g$  – Best glide speed

This is also described as L/D Max or the maximum lift to drag ratio.

**Describe the various components of an airfoil (PHAK 3-8 Fig. 3-6)**



**What is camber? Can we change it?**

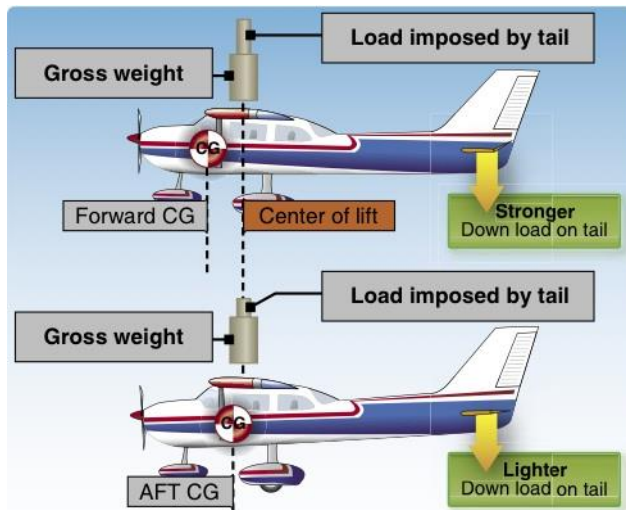
Curvature of the wing – it can be changed by extending/retracting flaps

**What is angle of incidence? Can we change it?**

The angle between the wing chord line and the fuselage – it cannot be changed

**What is center of gravity? What happens when it moves forward/aft? (PHAK 4-38)**

CG is the point where the aircraft is balanced or the place where the entire weight is concentrated



Forward CG	Aft CG
Lower Cruise Speed	Higher Cruise Speed
Higher Stall Speed	Lower Cruise Speed
More Stable	Less Stable
Favorable Stall Recovery	Adverse Stall Recovery
Difficulty in rotating and rounding out during landing. Also, difficulty in steering can result.	Shorter arm between CG and control surfaces on the tail makes them less effective.

Forward CG – This is a nose heavy condition that results in the pilot having to use more back pressure to maintain a level flight attitude. More tail down force means that the wings must overcome this weight. The cruise speed is lower because of this. The imposed load increases the stall speed.

Aft CG – Less tail down force (provided by our stabilator) is required when flying with an aft CG. This means that the wings also have less of this load to overcome therefore there is less overall drag allowing for a faster cruise speed. Because stall speeds increase with load, an aft CG also

means that the stall speed is lower. The distance between the CG and the stabilator is crucial in maintaining authority over the control surface. An aft CG means a shorter arm and thus, less authority. This translates into adverse stall recovery characteristics.

### **What causes a wing to stall? (PHAK 4-22)**

The wing will stall anytime the critical angle of attack is exceeded.

### **How does temperature change the takeoff distance? Weight? Air density? (PHAK 10-2 and 9-2)**

High temperatures = less dense air

Less dense air exerts less force on airfoils (wings and propeller) making them less efficient and also deprives the engine of power. This leads to longer take off rolls and decreased climb performance.

Higher weight also leads to longer take off rolls and increased landing distance because it takes more engine power to accelerate a heavy aircraft to  $V_r$  and more braking power to slow the aircraft down.

### **What are the different types of airspeeds? Altitudes? (PHAK 7-6 and 10-17)**

IAS – indicated

CAS – calibrated (IAS corrected for instrument, position, and installation error) It is equal to TAS in the standard atmosphere at sea level.

TAS – true (CAS corrected for non-standard temperature and pressure)

GS – ground (TAS corrected for wind)

Indicated – altitude as read off of the altimeter with appropriate setting

Pressure – vertical distance above the standard datum plane: a theoretical plane where sea level pressure exists. It can be found by setting 29.92 in Kollsman window and reading the altitude.

Density - Pressure altitude corrected for non-standard temp.

True – vertical distance above sea level (MSL)

Absolute - vertical distance above terrain (AGL)

### **Calculate pressure/density altitude.**

PA = Altitude (field elevation) + (29.92 - current altimeter setting) x 1000

DA = PA + [120 x (outside air temp.in degrees Celsius – standard temp. for that altitude)]

### **What factors affect air density? (PHAK 10-4)**

Heat – warm air expands is less dense

Height (altitude) – air at higher altitudes is less dense

Humidity – A parcel of humid air is less dense because water molecules take up more room and spread out the air molecules.

### **What are the maximum ramp, takeoff & landing weights for the airplane? (POH 1-4)**

2550lbs

### **Why is the ramp weight different from takeoff weight? (POH 1-8)**

Ramp weight = max weight approved for ground maneuvers (taxi)

Takeoff weight = max weight approved for takeoff run

**How do you find the crosswind component? Max crosswind component for aircraft? (AIM 4-3-3) (POH 4-1)**

Max demonstrated crosswind is 17 knots

**How does wind affect takeoff and landing?**

Headwinds decrease takeoff and landing roll – Tailwinds increase the takeoff and landing roll

**How much does one gallon of 100LL weigh? (PHAK 9-5)**

*6 lbs*

**Discuss V-speeds (PHAK 10-17) (POH section 2)**

**V<sub>so</sub> 45** – stalling speed in the landing configuration

**V<sub>s1</sub> 50** – stalling speed in specified configuration

**V<sub>y</sub> 76** – best rate of climb (greatest altitude gain per unit of time)

**V<sub>x</sub> 64** – best angle of climb (greatest altitude gain per distance over the ground)

**V<sub>fe</sub> 102** – flap extension speed

**V<sub>a</sub> 89-113** – design maneuvering speed (heavier aircraft = higher maneuvering speed)

**V<sub>no</sub> 125** – maximum structural cruising speed (flight above this speed only permissible in smooth air)

**V<sub>ne</sub> 154** – never exceed speed

**Does V<sub>g</sub> change? Why?**

V<sub>g</sub> is only 76 at max gross weight. V<sub>g</sub> will be slower at a lower weight



## When would you want to climb at $V_x$ ? How about a $V_y$ climb?

$V_x$  is used to clear an obstacle

$V_y$  is used to get to altitude in the shortest amount of time

## Explain left turning tendencies. **TGAS (PHAK 4-26)**

**T**orque – clockwise spinning prop causes airplane to roll left about the longitudinal axis. This is an example of Newton's 3<sup>rd</sup> law.

On the ground, this left rolling tendency causes more weight to be on the left main gear thereby increasing the friction and inducing a left yawing tendency.

**G**yroscopic Precession – During a descent the tail rises and causes a force to be felt on the top of the propeller. The resultant force is therefore 90 degrees ahead in the direction of the rotation (**RIGHT SIDE** of propeller) causing a left yawing tendency. This is mostly associated with tailwheel aircraft because on their takeoff roll the tail has to be raised and this creates a left turning tendency.

*\*This is otherwise a right turning tendency in a climb because the effective force would now be at the bottom of the propeller and thus the effective force would be on the **LEFT SIDE**. The other left turning tendencies, however, make this effect negligible.*

**A**symmetrical Thrust – In a climb, the descending propeller blade (**RIGHT SIDE**) has a greater angle of attack and therefore **creates more lift**. This causes a left yawing tendency.

**S**piraling Slipstream – **Propeller wash strikes the aircraft** of the left side of the vertical stabilizer causing a left yawing tendency.

*\*The slipstream also strikes the right wing from above causing a right rolling tendency. The left rolling tendency from torque, however, makes this effect negligible.*

All of these tendencies are more pronounced at low airspeeds, high angles of attack, and high power settings.

### **Explain Stability (PHAK 4-13)**

#### **Lateral Stability – Resistance to roll**

Wing dihedral is what gives our aircraft lateral stability. The soft V shape means that during a side slip, the lower wing has a greater angle of attack and this helps return it to equilibrium.

Effectively managing fuel can also influence this because if the fuel load is imbalanced, one wing will be lower than the other

#### **Longitudinal Stability – Resistance to pitch**

Flying “inside of the envelope” is the greatest factor here. CG must be within limits to maintain longitudinal stability.

#### **Vertical Stability – Resistance to yaw**

The size of the vertical stabilizer and the area of the fuselage aft of the CG contribute to vertical stability. The bigger and farther aft the vertical stabilizer is, the greater the stability.

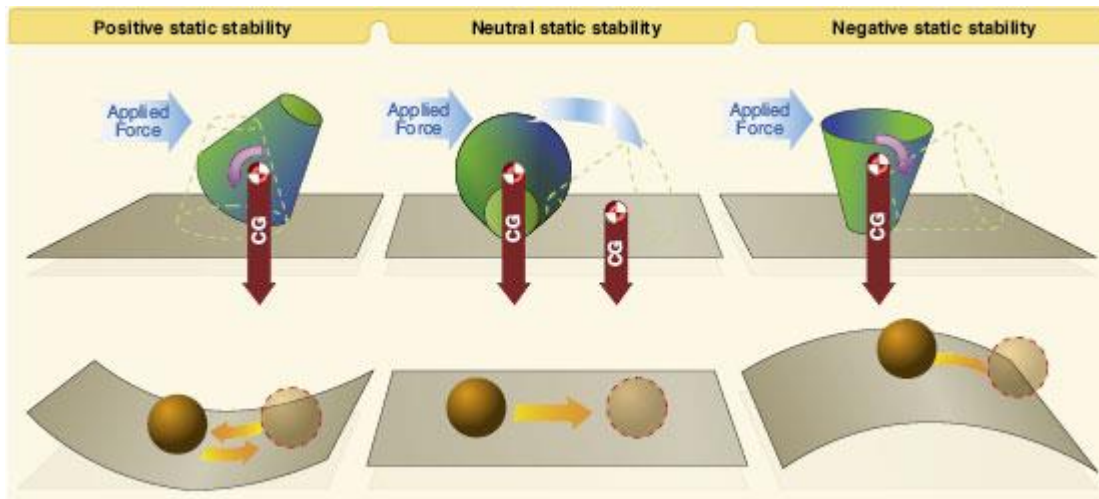
Positive Stability – Tendency to return to equilibrium

Neutral Stability – Tendency to stay in new position

Negative Stability – Tendency to continue to move away from equilibrium

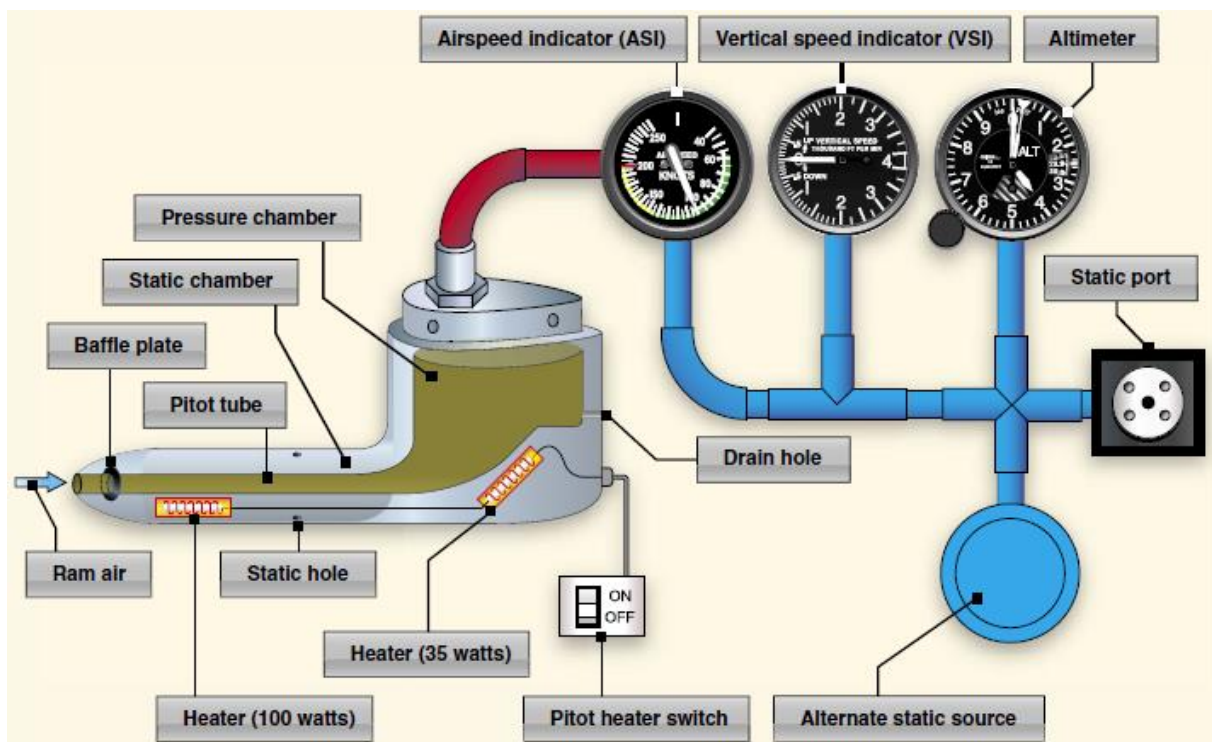
Static Stability – Initial tendency

Dynamic Stability – Response over time



## Operations of Systems (PHAK Chapter 7) (POH)

Describe the pitot-static flight instruments






Airspeed Indicator – This is the only instrument that uses both the pitot and static ports. It measures the difference between dynamic pressure (ram air entering the pitot tube) and static

pressure (air that is unaffected by the aircraft's flight path). Ram air exerts a force on a diaphragm inside of the instrument. The instrument case is full of static air.

**Altimeter** – This measures the difference between static pressure inside of the instrument case and standard pressure (29.92" Hg) sealed inside of an aneroid wafer. When the airplane is climbing and ambient pressure begins to decrease, the wafer is able to expand because the air that is sealed inside is now of higher pressure. The altimeter is a sensitive altimeter meaning that it can be calibrated to the local barometric pressure by adjusting the Kollsman window.

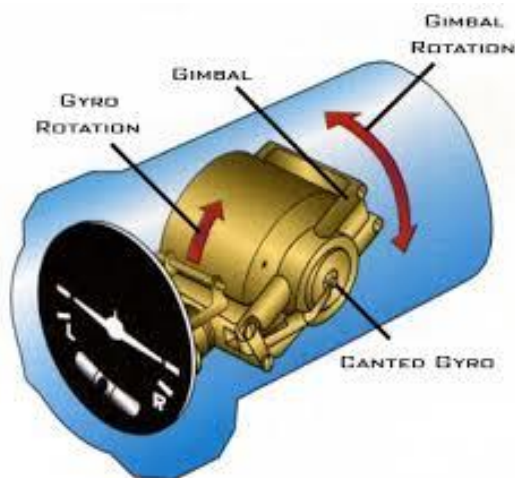
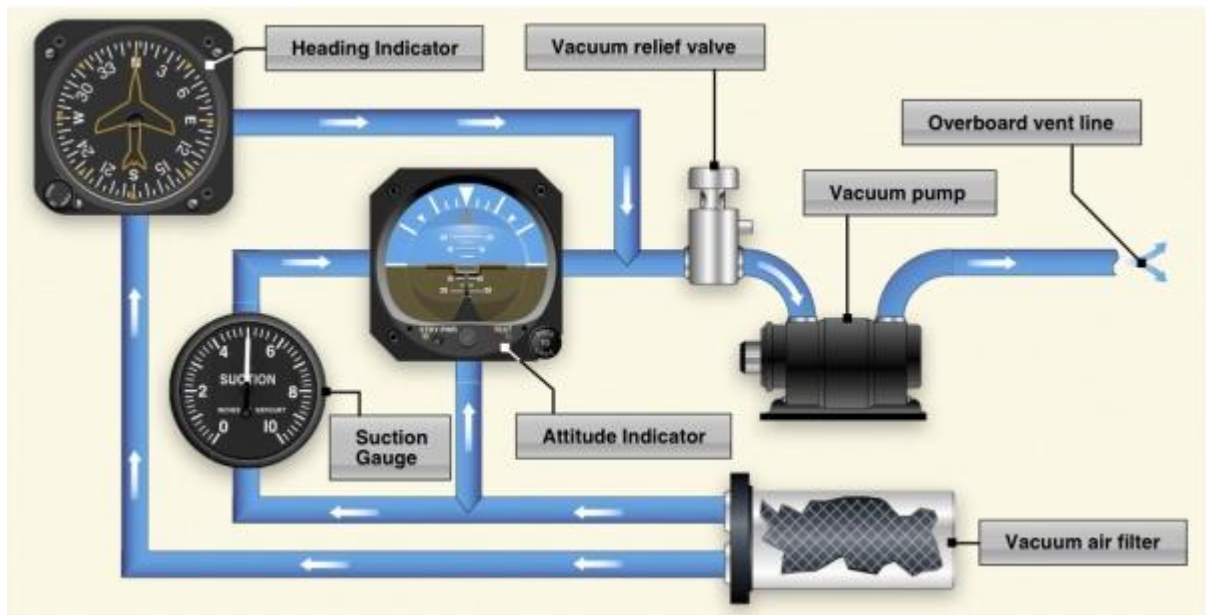
**VSI** – Measures the difference between static pressure and static pressure that is subject to a calibrated leak approximately every 6-9 seconds.

### How do the pitot- static instruments respond to blockages?

	 Indicated Airspeed	 Indicated Altitude	 Indicated Vertical Speed
<b>Pitot Ram Air Source and Drain Hole Blocked</b>	Increases with altitude gain; decreases with altitude loss	Unaffected	Unaffected
<b>Pitot Ram Air Source Blocked and Drain Hole Open</b>	Displays zero knots	Unaffected	Unaffected
<b>Static Source Blocked</b>	Decreases with altitude gain; increases with altitude loss	Does not change with altitude gain or loss	Does not change with vertical speed changes
<b>Both Static and Pitot Sources Blocked</b>	All indications remain constant, regardless of changes in airspeed, altitude, and vertical speed.		

*\*Note the very first error – this error would be highly uncommon in the Piper Archer because there is no drain hole on the pitot mast like most other training aircraft. If there is a blockage in the pitot mast, the drain hole would more than likely be unaffected.*

### Describe the gyroscopic instruments



The Gyroscopic instruments are powered by an engine driven vacuum pump with the exception of the turn coordinator which is electrically powered. The two principles that gyroscopes operate off

of are:

*Rigidity in space: while spinning, a gyroscope will tend to stay fixed in its plane of rotation. Think of a bicycle wheel. With enough momentum, you are able to stay naturally balanced.*

*Precession: when a force is applied to a gyroscope, the resultant force is felt 90° ahead in the direction of the rotation.*

Attitude Indicator – Rotates in the horizontal plane and operates off of the principle of rigidity in space. The aircraft pitches and rolls around the erect gyroscope. The effects of precession are not felt because pendulous vanes attached to the base of the gyro duct high pressure air from the vacuum through small doors that open and close by the force of gravity to keep the gyro in its original position.

Heading Indicator – Rotates in the vertical plane and operates off of rigidity in space as well. As the aircraft yaws around the gyro, a gear inside of the instrument case rotates the compass card to show the magnetic direction. Precession caused from aircraft movement and friction causes error that must be corrected by resetting the heading indicator to the magnetic compass approximately every 15 minutes.

Turn Coordinator – This electrically powered gyro rotates in the vertical plane and it uses precession to measure rate of turn and rate of roll. When the aircraft yaws, the gyro precesses and the airplane on the face of the instrument indicates the direction and rate of the turn. Notice in the diagram of the instrument that it is slightly canted upwards. This is so rate of roll can be indicated as well. When the aircraft begins a bank the aircraft will also indicate the direction of the bank. If it is a rapid roll the airplane will respond by banking more steeply. Once the turn is established it will properly indicate the rate of the turn.

**Explain the errors associated with the magnetic compass**

Variation – Since the magnetic north pole and the geographic North Pole are not collocated, we need to consider this when planning flights. Easterly variation is subtracted from true heading while westerly variation is added to get our magnetic heading. Remember: East is least and West is best!

Deviation – Since a compass depends on aligning with the Earth's magnetic fields to read accurately, any kind of other local magnetic fields will cause an error known as deviation. These other magnetic fields are produced from electrical currents from the aircraft avionics and are change on different headings. The compass correction card located on the compass tells the pilot which compass heading to steer to for a desired magnetic heading.

Dip Errors – While flying on a north or south heading, these turning errors are most pronounced. While flying a north heading and turning to the left, the compass will initially show a turn in the opposite direction and lag behind the turn. When on a south heading, the compass will lead the turn and show that the turn is being made at a much faster rate than it actually is.

*\*Imagine that north is home to the compass. While at "home" the compass wants to stay there during a turn and will lag behind before it finally decides to catch up reluctantly. Conversely, while most far away from home on a south heading, when a turn is commenced, the compass gets excited and races there (leading the turn)*

Acceleration Error – While on east or west headings, acceleration results in a slight turn to the north.

Deceleration results in a slight turn to the south. The rule is: **ANDS** Accelerate **N**orth **D**ecelerate **S**outh

Oscillation Error – A combination of all of these errors and results in the compass swinging back and forth around the headings being flown

### **Describe the engine in this aircraft. (1-3)**

Naturally aspirated 180 HP Lycoming O-360-A4M horizontally opposed 4 cylinder air cooled direct drive carbureted reciprocating piston engine

### **What does "normally aspirated" mean? (PHAK 6-11)**

Ambient air enters the intake manifold – there is no turbo or supercharger

### **What is used to cool the engine? (PHAK 6-16)**

Air intakes at the front of the engine cowling allow outside air to cool the cylinders. Fins on the filters allow a greater surface area to be exposed and thus cooled by the air. Engine oil is crucial in internal engine cooling.

### **Why do we need oil in the engine?**

Lubricates - all of the engine's moving parts

Cools – reduces friction and removes heat from the cylinders

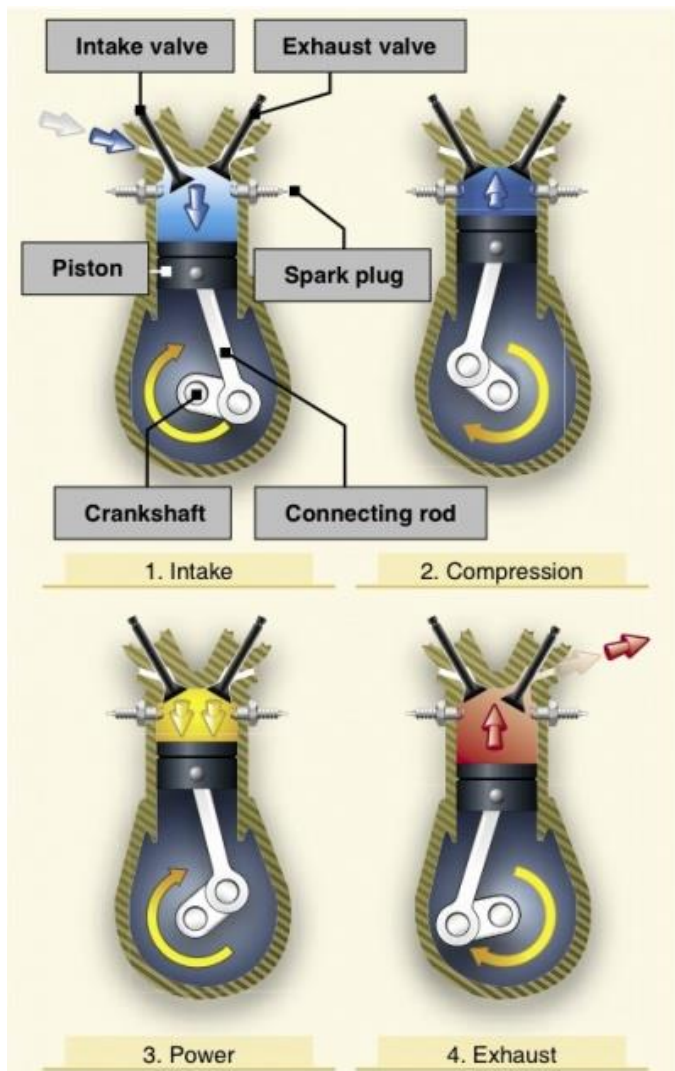
Seals – it creates a seal between the cylinder walls and pistons

Cleans – carries away contaminants inside of the engine

### **What is meant by four-stroke”? (PHAK 6-3)**

1. Intake valve opens as downward moving piston pulls fuel/air mixture into cylinder
2. Intake valve closes as piston moves back up and compresses this mixture
3. While this piston is in its upmost position the spark plugs ignite the mixture and force the piston back down
4. As the piston rises, the exhaust valve opens and expels the exhaust gas from the cylinder





•What is the oil capacity of your aircraft? (1-3)

8 qts

**What type of oil do we use?**

W15W-50

**What type of propeller do we have? (1-3)**

76" Sensenich fixed pitch

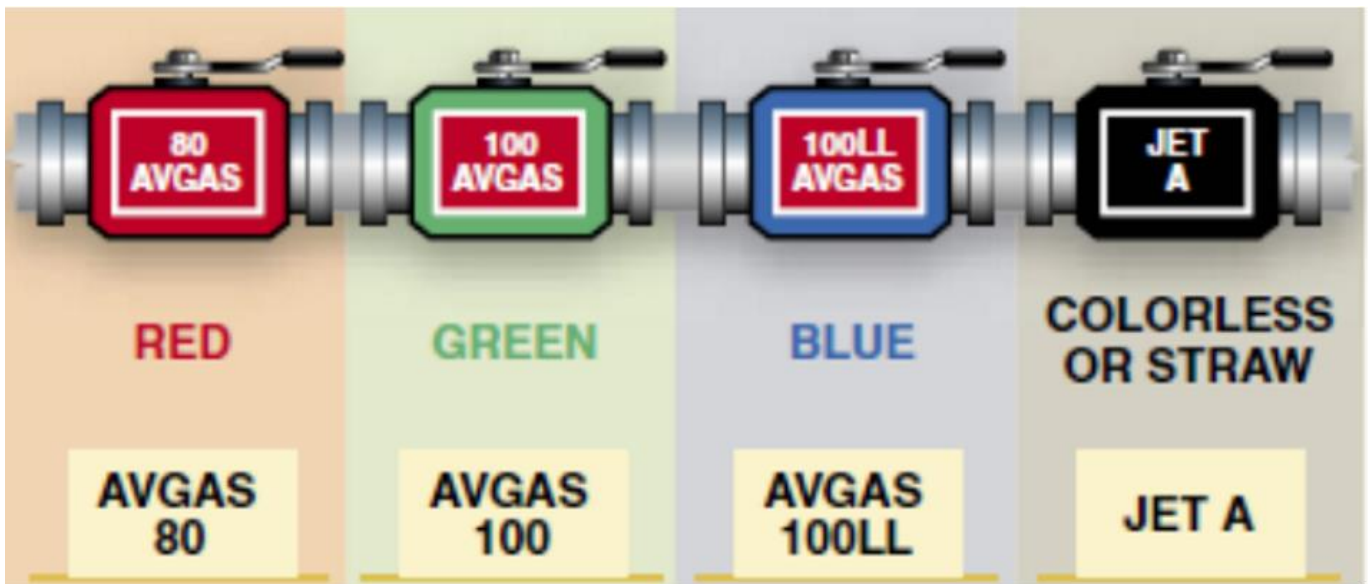
**What does the mixture control do? (PHAK 6-8)**

As we gain altitude, the air becomes less dense. If we do not make any adjustments then we will have an excessively rich fuel/air mixture. This can result in carbon build up in the cylinders which can foul the spark plugs and reduce engine power. Leaning the mixture decreases the fuel flow and compensates for this.

**Describe the fuel system. (7-8)**

We have one fuel tank per wing each with a 25 gallon capacity. 1 on these gallons is unusable which mean that of 50 total gallons, only 48 are useable. Fuel is moved from the tanks to the engine by an engine driven fuel pump. The boost pump is electrically powered and is used as a backup. A fuel selector valve allows the pilot to control which tank he/she would like to pull from. There is no option to pull from both at the same time. Fuel quantity and pressure gauges are in the cockpit to make the pilot aware of the current fuel situation. Fuel enters the float type carburetor via a fuel inlet and is drawn into the venturi to be mixed with air through a discharge nozzle prior to reaching the cylinders. Underneath both wings near the landing gear is a sump to drain fuel samples from each tank. This is the lowest point of either tank. The lowest point of the fuel system can be drained from the sump located on the front left side of the aircraft.

**What color is 100LL? How about other types of fuel? What happens when they are mixed together? (PHAK 6-27)**



Mixed fuel becomes clear

**What could be other types of clear liquid?**

Jet A

**Why do you drain a sample of fuel before each flight?**

Fuel weighs roughly 6lbs and water weighs about 8lbs. Because it is heavier it always sinks to the bottom of the fuel tanks. This is why we drain from the lowest points in the fuel system. We also want to visually inspect the fuel for the proper grade and to make sure **that it is free of sediment**.

**What are stall strips?**



They are placed on the leading edge of the wing close to the wing root to help induce a stall towards the wing root so that pilot still has directional control with the ailerons.

**What type of brakes does the airplane have? (7-3)**

Cleveland single disc hydraulic brakes

**How does the vacuum system operate? (PHAK 7-17) (POH 7-17)**

An engine driven vacuum pump creates suction. Air is pulled through a filter and then directed to the instrument case. Rotor vanes on the gyros catch the air like a water wheel and cause it to rotate at a high speed. In the Archer IIIs, there is also an electrical vacuum pump to be used as a backup.

**Describe the electrical system. (7-10 - 7-12)**

Archer II: 12 volt batt. 14 volt system 60 amp alternator

Archer III: 24 volt batt. 28 volt system 70 amp alternator

The electrical system provides power to all of the radio equipment, the engine gauges, turn coordinator, stall warning horn and all the lights

The magnetos are a self-sustaining source of electricity. As long as the propeller and crankshaft is turning, they will continue to provide electricity to the spark plugs and the engine will run. This means that in the event of an electrical failure, you will NOT lose your engine.

**National Airspace System (PHAK chapter 14)**

## **What is the difference between controlled and uncontrolled airspace?**

Class G is the only uncontrolled airspace. ATC has no jurisdiction.

## **What are the different classes of airspace? Requirements? Weather minimums?**

**A** – FL 180 to FL 600 – Instrument Rating and IFR flight plan needed – Mode C Transponder and 2-way radio communication – no weather minimums

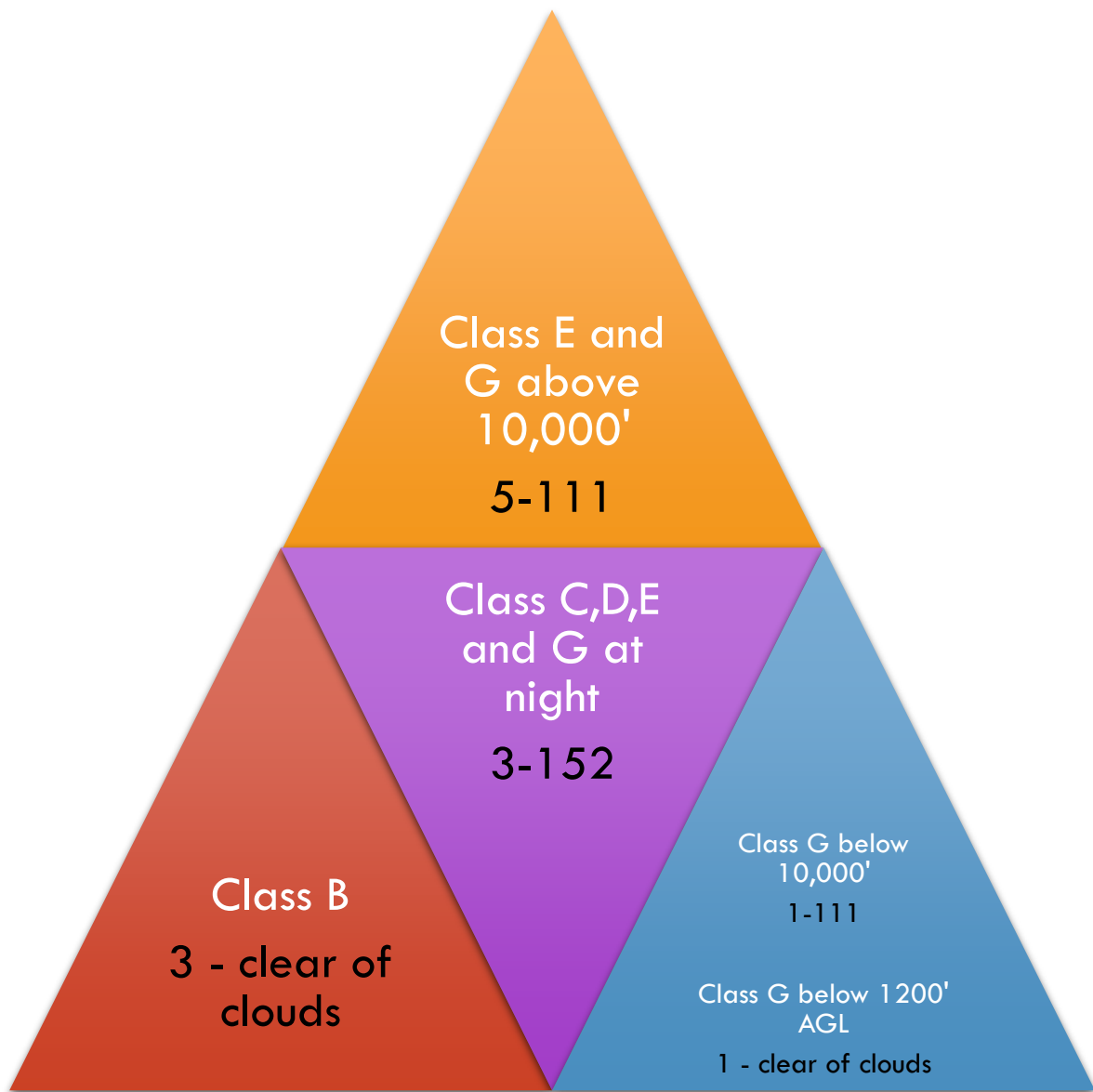
**B** – Upside down wedding cake design up to 10,000 MSL – Endorsement needed if student pilot – Clearance from ATC required to enter – Mode C Transponder required any time within 30 nm (mode C veil) – 3 miles visibility and clear of clouds

**C** – Inner core 5 nm radius and from surface to 4500 AGL – outer core 10 nm radius and from 1200' AGL to 4000' AGL – Mode C Transponder and 2 way radio communication – 3 miles visibility and 1000' above 500' below and 2000' horizontal from clouds

**D** – 4 nm radius and from surface to 2500' AGL – 2 way radio communications – 3 miles visibility and 1000' above 500' below and 2000' horizontal from clouds

**E** – Can start at the surface, 700' AGL, or 1200' AGL and may extend up to but not including FL 180 – Class E also exists above FL 600 – No equipment requirements - Below 10,000': 3 miles visibility and 1000' above 500' below and 2000' horizontal from clouds – Above 10,000': 5 miles visibility and 1000' above 1000' below and 1 mile horizontal from clouds

**G** – uncontrolled airspace – may start at the surface and can go as high as 14,500' MSL or 1200' AGL – no equipment requirements – Below 1200' AGL : 1 mile visibility and clear of clouds – Above 1200' AGL but below 10,000' MSL : 1 mile visibility and 1000' above 500' below and 2000' horizontal from clouds – At night: 3 miles visibility and 1000' above 500' below and 2000' horizontal from clouds – Above 10000' : 5 miles visibility and 1000' above 1000' below and 1 mile horizontal from clouds



**What airspace are we in right now?**

Class D

**What altitude does KMYF airspace go up to?**

2,900'

**What airspace is directly above KMYF airspace?**

Class E begins above 2900' and continues until 4800' where it becomes class B.

## **What are the different types of Special Use Airspace? WCRAMP (AIM 3-4-1) (PHAK 14-3)**

**Warning Areas** – Extends from 3nm outward from the U.S. coast – invisible hazardous to non-participating aircraft.

**Controlled Firing Areas** (does not appear on charts) – Activities that could be hazardous are suspended immediately when a spotter detects an aircraft.

**Restricted** – Unusual and oftentimes invisible hazards such as artillery or missile firing. When the restricted areas is active pilots will need to get permission from the controlling authority to enter.

**Alert** – May contain a high volume of pilot training or unusual aerial activity. No clearance is needed to enter but all pilots should be very alert.

**Military Operation Area** – Military training such as aerial intercepts, formation flying, and low altitude tactics is conducted in these areas. Contact FSS to obtain hours of operation and it is advised to contact controlling agency for traffic advisories. Permission is not needed to enter, but pilots must exercise extreme caution.

**Prohibited** – Areas designated for national security or welfare. Flight in this area is prohibited.

## **What are the different types of "Other Airspace Areas"?**

**Local Airport Advisory** – operated within 10sm or airport with FSS but no operating control tower.

**Military Training Routes** – Military aircraft travelling in excess of 250kts

Routes designated by (IR) are IFR

Routes designated by (VR) are VFR when visibility is 5sm or greater and ceilings are at least 3000'

Routes with no segment above 1500' AGL are identified by 4 numbers. For example (VR) 1205.

If there is a segment above 1500, the route will be identified by only 3 numbers.

Temporary Flight Restriction – Established to protect the President or other VIPs, provide a safe environment for disaster relief, or to prevent aircraft from sight-seeing over public events.

Parachute Jump Zones – check A/FD for details

Published VFR Routes – Published on TACs to provide VFR aircraft with a means to transition around, under, or through complex airspace. For example, Coastal Route, Mini Route, Special Flight Rule, Hollywood Park Route or Coliseum Route

Terminal Radar Service Areas – Pilots can voluntarily receive radar services from TRACON so that IFR and VFR traffic can have separation. Participation is encouraged. It can be identified on the chart by a heavy grey line (see Palm Springs)

National Security Areas – They exist where there is a need for heightened security and safety of ground facilities. Sometimes flight in this area is prohibited but otherwise pilots are encouraged to stay away from these areas.

**When do we need a Mode C transponder? (91.215)**

Class A, B, C airspace. Inside of the mode C veil, above class C airspace, and above 10000'

### **Weather Information (AC 0045G; [AC 00-6A](#))**

**What are the standard temperature and pressure values for sea level? (pg. 13)**

15C or 59F – 29.92" Hg or 1013.2 mb



**Discuss isobars. What does it mean when the isobars are close together? (Pg.15 and 24)**

Isobars connect equal lines of pressure. Closely spaced isobars means that there is a strong pressure gradient and winds will be strong.

**How do surface winds flow in relationship to isobars? Why? Winds aloft? (pg.25)**

At the surface winds flow at an angle to the isobars because of surface friction.

Aloft, winds from more or less parallel because of the Coriolis force.

**What type of clouds, visibility and precipitation would you expect from stable air? Unstable air? (Chapter 6)**

Stable air: stratiform clouds, poor visibility, smooth air, steady or continuous precipitation

Unstable: Cumuliform clouds or clouds with vertical development, good visibility, turbulence, and showery precipitation

**What are the general characteristics of low/high pressure areas? (pg.35)**

Low – Cyclone – counterclockwise and rising air

High – Anti Cyclone – clockwise and descending air

**What is a ridge? Trough? (pg.35)**

Ridge – extended area of high pressure – descending air

Trough – extended area of low pressure – rising air

**What must be present in order for a thunderstorm to form? (pg.111)**

Unstable atmosphere (pg.52) – an unstable atmosphere can be noted by the ambient lapse rate. We know that the standard lapse rate is about 2 degrees Celsius per 1000' of altitude. If the ambient

lapse rate is greater than the standard lapse rate (i.e. the temperature is decreasing rapidly as you climb), this means the atmosphere is unstable.

Sufficient Moisture – the temperature/dew point spread can be used to determine how moist the air is. The closer the temperature and dew point spread, the closer the air is to becoming saturated or so full of moisture that it can hold no more. Warmer air can hold more moisture than cooler air.

Lifting Action – Some of these lifting actions may include heating from below (rising warm air called thermals), orographic lifting (wind pushing a moist unstable air mass upslope), or frontal lifting (a fast moving cold front displacing warm, moist, and unstable warmer air for example).

### **What are the stages of a thunderstorm?**

Cumulus – the building stage of a thunderstorm characterized by updrafts only. All thunderstorms begin as cumulus clouds but not all cumulus clouds become thunderstorms.

Mature – Updrafts and downdrafts both occur at this point. Violent turbulence can be experienced if flight is attempted beneath a cumulonimbus cloud because of this shear zone. The mature stage can be recognized by the beginning of rainfall.

Dissipating – At this point the cloud is only giving off downdrafts and the thunderstorm is dissipating. During this stage, large cumulonimbus clouds may have a recognizable “anvil top” that is a portion of the cloud that has been sheared off by the jet stream. The direction in which the anvil top is facing also shows the direction in which the storm is moving.

### **What is wind shear? Why is it an operational hazard? (pg.86)**

Rapid change in wind direction or velocity – it can cause dramatic changes in indicated airspeed and causes severe turbulence within the shear zone

### **What does dew point mean? (pg.38)**

The temperature at which the air becomes saturated

**Discuss the types of fog. Advection, Radiation, Upslope, Precipitation-Induced (pg. 126-128)**

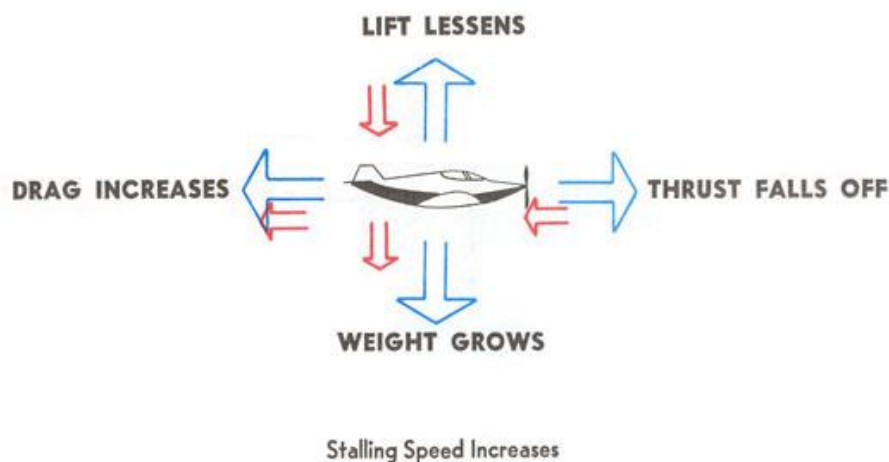
Advection: moist warm air moves over colder land or water

Radiation: forms on clear nights with little or no wind and only over land

Upslope: moist unstable air is cooled as wind pushes it up a slope

Precipitation Induced: warm rain falls through cool air. Evaporation from the rain saturates the cool air and fog forms.

**How does icing affect aircraft performance? (Chapter 10)**



**Discuss the types of icing.**

Induction Icing – This includes any icing that impedes that process of air entering the intake manifold to be mixed with fuel. Ice that builds up on the air intakes is an obvious form of this.

Carburetor ice is also a form of induction icing. This can be attributed to the incomplete vaporization of fuel in combination with the pressure decrease inside of the venturi. Even on a day as warm as 70°F, carburetor ice can began to form with adequate moisture in the air.

Instrument Icing – Icing of the pitot tube or static ports can cause the instruments to give inaccurate readings or to fail completely.

Structural Icing – Ice that forms on the surface of the aircraft. Since airfoils create lift by decreasing the pressure and thus the temperature of the air around them, icing on the propeller, horizontal and vertical tail surfaces, and wings can form at ambient temperatures that are above the freezing level. Structural icing includes:

Rime Ice – Small rain drops found in stratified clouds or drizzle freeze upon impact with the airfoil. Air that is trapped between the droplets give the ice a white or opaque appearance. It builds up typically at the leading edge only and has an irregular shape. This makes it more easily recognizable to the pilot and easier to remove by deicing equipment.

Clear Ice – Large super-cooled water droplets found in either heavy rain or in cumuliform clouds strike the airfoil but do not freeze immediately. Instead they slide backwards across the surface as they freeze. Clear ice is smooth and glossy making it very difficult to see from the cockpit. Because it adheres to the surface beyond the leading edge it can be difficult to remove.

Mixed Ice – Occurs when drops vary in size.

**What types of weather briefings can you get from a Flight Service Station briefer? (AIM 7-1-**

**4)**

Standard – Should be requested when planning a flight and no previous weather information has been gathered

Abbreviated – Used to supplement mass disseminated data or to update a previous briefing

Outlook – Request when proposed departure time is 6 or more hours away.

**What is EFAS (Flight Watch)? (AIM 7-1-5)**

Enroute Flight Advisory Service – provides up to date weather advisories for pilots while enroute

**On what frequency can you contact EFAS?**

Contact FSS – 122.0 no longer in use as of October 2015

**What is a METAR? Types, issue, and valid times? (3-1) (AIM 7-1-31)**

Aviation Routine Weather Report

Routine or special

Issued hourly

Valid for the hour

**What is a TAF? Issue, valid times, area of coverage? (7-19) (AIM 7-1-31)**

Terminal Aerodrome Forecast

3 types: Routine (TAF) Amended (TAF AMD) or Corrected (TAF COR)

Issued 4 times a day (every 6 hours)

Valid for 24-30 hours

Forecast for area within 5sm of airport

**What is the definition of a ceiling? (7-26) (AIM 7-1-16)**

The height above the ground of a broken or overcast layer

**Does a TAF report cloud ceilings in MSL or AGL?**

MSL

**Describe FROM, BECMG, TEMPO, PROB, on a TAF? (7-28 - 7-31)**

FROM – Rapid change occurring within 1 hour

BECMG – Gradual change to take place over the course of 1 hour

TEMPO – Between the predicted period, this weather will only occur for less than an hour

PROB – number placed afterwards is the probability of the weather forecasted to occur

**Area Forecast? Issue, valid times? What are the four sections of an Area Forecast? (7-1)**

Issued 4 times daily

Header

Synopsis: Valid for 18 hours – contains a short description of weather affecting the area during the valid period. This includes location and movement of pressure system.

VFR clouds and weather: Valid for 12 hours – gives a general description of clouds and weather that are significant to VFR operations.

Outlook: Valid for 6 hours –describes the prevailing condition

**Does an Area Forecast report cloud ceilings in MSL or AGL?**

MSL unless preceded by AGL or CIG (ceiling)

**AIRMET? Issue, valid times, Sierra, Tango, Zulu? (6-23) (AIM 7-1-10) (PHAK 12-12)**

## Airmen's Meteorological Information

Issued for: Mountain obscuration and widespread IFR conditions (Sierra)

Moderate turbulence and surface winds greater than 30kts (Tango)

Moderate Icing (Zulu)

Valid for 6 hours

### **SIGMET? Issued? Valid? Why are they issued? (6-1)**

Significant Weather Information

Issued for: Severe Turbulence not associated with T-storms

Widespread dust storms and volcanic ash

Severe Icing

Valid for 4 hours

### **CONVECTIVE SIGMET? Issued? Valid? Why issued? (6-4)**

Issued for thunderstorm (convective) activity

Winds greater than 50 kts

Hail greater than  $\frac{3}{4}$ "

### **Winds and Temperatures aloft Forecast? (7-39)**

Issued twice a day every 12 hours and provide wind and temperature information for specific areas within the U.S.

### **How are temperatures above 24,000 identified?**

Temperature above 24000 feet are negative

**What does 710556 mean on a Winds and Temperatures Aloft Forecast if the forecast level is 30,000 feet?**

Winds are from 210 at 105 kts and temperature is –56 C

**Winds will not be forecast within how many feet of station elevation on an FD? (7-39)**

1500'

**Temperatures will not be forecast within how many feet of station elevation? (7-39)**

2500'

**Discuss the Surface Analysis Chart? Issued? Valid? Information? (5-1) (PHAK 12-15)**

Issued 8 times daily and valid for 3 hours

Shows position of pressure systems, fronts, local weather, wind speed and directions, and visual obstructions.

**Discuss the Weather Depiction Chart? Issued? Valid? Information? (5-38) (PHAK 12-16)**

Graphical depiction of METAR information

Issued 8 times daily and valid for 8 hours

It is a flight planning tool to see overall surface conditions across the U.S.

**Discuss the Significant Weather Prognostic Chart? Issued? Valid? Info? (8-8)**

Forecast of aviation weather hazards such as icing, freezing levels, and turbulence

Issued 4 times a day there is a 12 hour forecast and a 24 hour forecast

**Discuss the Radar Summary Chart? Issued? Valid? Info? (5-47) (PHAK 12-17)**



Issued 35 minutes past every hour and valid for 1 hour.

Displays areas of precipitation and indicates the height of the radar echo tops in hundreds of feet MSL. Movement of cells is indicated by an arrow that points in the direction of the movement with the speed in knots beside it. This chart does not show clouds or fog, only precipitation.

### **VFR Cross Country Considerations**

***Stage 1 Scenario:** 1 passenger @ 120lbs and 5lbs of baggage*

***Stage 2 Scenario:** 1 passenger @ 150lbs and 15lbs of baggage – VFR flight plan to KHMT*

***End of Course Scenario:** 1 passenger @ 165lbs and 15lbs of luggage - VFR flight to KHND*

**What preflight action is required by the FARs? NWKRAFT (91.103)**

N**OTAMS**

W**eather**

K**nown ATC delays**

R**unway Lengths**

A**lternates**

F**uel**

T**akeoff and Landing Distances**

**What is a NOTAM? (AIM 5-1-3)**

Notice to Airmen – it is time critical information that is not known in advance enough to be published on an aeronautical chart.

### **Where can I Find Runway Lengths?**

A/FD

### **What is an Alternate?**

A second option for landing in case you cannot land at your planned destination

### **What are the Fuel requirements for this flight? (91.151)**

Day VFR – to the destination + at least 30 minutes of reserve fuel

### **What the right-of-way rules are as applied to the different categories of aircraft? EBGAAR (91.113)**

**E**mergency - Aircraft in distress have priority

**B**alloon

**G**lider

**A**ircraft refueling

**A**irship

**R**otorcraft or airplane

**Required action for all aircraft confrontations (same category): converging, approaching head-on, overtaking**

Converging: Aircraft on the right has the right of way

Head on: Both divert to the right

Overtaking: Overtake on the right side

**What is the maximum airspeed below 10,000' MSL? (91.117)**

250 knots

**Define Minimum Safe Altitude. (91.119)**

A minimum safe altitude is one that allows for an emergency landing without undue hazard to persons or property on the surface.



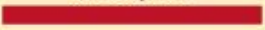



**Minimum safe altitude over congested area? (91.119)**

1000' above highest obstacle within 2000'

**In areas other than congested areas?**

500' above the surface or in sparsely populated areas such as open water: 500' away from any vessel, person, or structure

**Discuss Tower Light Gun Signals (AIM 4-3-13) (PHAK 13-15)**

Color and Type of Signal	Movement of Vehicles, Equipment and Personnel	Aircraft on the Ground	Aircraft in Flight
<b>Steady green</b> 	Cleared to cross, proceed or go	Cleared for takeoff	Cleared to land
<b>Flashing green</b> 	Not applicable	Cleared for taxi	Return for landing (to be followed by steady green at the proper time)
<b>Steady red</b> 	Stop	Stop	Give way to other aircraft and continue circling
<b>Flashing red</b> 	Clear the taxiway/runway	Taxi clear of the runway in use	Airport unsafe, do not land
<b>Flashing white</b> 	Return to starting point on airport	Return to starting point on airport	Not applicable
<b>Alternating red and green</b> 	Exercise extreme caution!!!!	Exercise extreme caution!!!!	Exercise extreme caution!!!!

**What is pilotage? Dead reckoning? (PHAK 15-12)**

Pilotage: Using visual landmarks and references

Dead Reckoning: Using predetermined headings and performance calculations

**What is magnetic variation? (PHAK 15-7)**

Difference between magnetic north and true north

**What limitations apply to VOR? (PHAK 15-26) (AIM 1-1-3)**

VORs are limited by their power output. Service volumes range from 25nm to 130nm depending on class of VOR and altitude of aircraft. VORs also operate off of the line of sight principle. This means that if there is terrain between the aircraft and the station, the signal may not be received.

**What do you do if you become lost in-flight? 5 Cs (PHAK 15-34)**

**C**limb – obtain a better view of your surroundings

**C**ircle – don't become more lost; stay in one spot

**C**onserve – lean your mixture and save fuel

**C**ommunicate – make contact with an FSS or an air traffic controller

**C**onfess – don't be afraid to admit that you are lost. They are there to help you!

**Where else can I get information for our destination airport?**

A/FD

**And how often is the A/FD updated?**

Every 56 days

**Aeromedical Factors (AIM Chapter 8) (PHAK Chapter 16)**

**What are the body systems that are used to ascertain our orientation and movement in space? (PHAK 16-5)**

Vestibular – The inner ear system composed of 3 semicircular hollow but fluid filled canals arranged in the pitch, roll, and yaw axes. This endolymph fluid inside the canals moves when the head or body moves and displaces tiny hair cells that stimulate nerve impulses. These signals are then sent to the brain and interpreted as motion.

Somatosensory – The nerves in our skin cells. This is basically “flying by the seat of your pants” or the sensations of motion that we feel in our bodies from acceleration or turning.

Visual – Our Eyes. Light from the sun is constantly being reflected by everything on Earth. This light enters the eyeball through the cornea, travels through the lens and falls on the photoreceptors of the retina. The two kinds of photoreceptors are rods and cones. Rods are used for night and peripheral vision while cones are used to sense color.

**What is the cause of middle ear pain in flight and how can we mitigate it? (PHAK 16-4)**

Air inside of the middle ear is normally equalized through the Eustachian tube: a tube that travels from the ear to the back of the throat on each side. If there is any kind of congestion or blockage it makes this equalization difficult or impossible. In a climb, the air outside becomes less dense and the trapped higher pressure air in the middle ear tends to expand. In a descent, the trapped air is of lower pressure than the outside air and feeling of compression is experienced. This is typically more painful and more difficult to resolve. Sinus congestions cause pain from similar circumstances and can be very painful. The first step in avoiding this pain is to not fly with head colds or ear/sinus infections. In flight, equalization can be helped along by swallowing, yawning, tensing the throat muscles, or by executing the Valsalva maneuver. This is accomplished by

pinching the nostrils, closing the mouth, and attempting to exhale. Oral decongestions do not provide adequate relief and may have adverse side effects.

### **What is hypoxia and what are the different types? (AIM 8-1-2) (PHAK 16-2)**

Hypoxia is a state of oxygen deficiency in the body. It occurs at 4 different levels

#### **Lung: Hypoxic Hypoxia**

Oxygen is not available at adequate pressure for the lungs to absorb. This occurs when we climb higher in altitude and the air becomes less dense.

#### **Blood: Hypemic**

This is the inability of the red blood cells to carry oxygen to the other cells. The most common cause in aviation is carbon monoxide poisoning especially with small piston aircraft. Cabin heat is provided by ducting engine heat from the exhaust manifold into the cockpit. If there is any kind of leak in this system, exhaust fumes containing carbon monoxide will enter the cockpit as well.

Carbon dioxide molecules bond to the hemoglobin in red blood cells 200x faster than oxygen molecules, leaving no more room for the blood cells to carry the oxygen. Smoking cigarettes will also induce hypemic hypoxia because you are inhaling carbon monoxide. Other causes of this type of hypoxia include anemia (a sickness caused by lowered hemoglobin) or donating blood.

#### **Cell: Histotoxic**

This is the cells' (other than blood cells) inability to use the available oxygen. Using drugs or alcohol can cause this. When using even over-the-counter medicine, consult an AME to see if it is okay for use in flight.

#### **Transport: Stagnant**

Inability of oxygen to reach cells because of poor circulation. The most common form of this in aviation is when the body experiences excessive G-forces.

### **What are the symptoms of hypoxia?**

Poor judgement, memory, alertness, visual acuity and coordination. Sensation of euphoria or sometimes even belligerence can occur (a macho attitude). Other symptoms include, dizziness, headache, drowsiness and cyanosis (blue coloration of lips and fingernails).

### **What is hyperventilation? How do you treat a hyperventilating passenger? (AIM 8-1-3) (PHAK 16-3)**

It is an abnormal increase in the breathing rate that leads to a deficiency of carbon dioxide. This is usually brought on by stress or fear while flying and often begins subconsciously. Symptoms include, lightheadedness, dizziness, drowsiness, tingling in the extremities and feeling of suffocation that may ultimately lead to unconsciousness. Treat a hyperventilating passenger by having them consciously control their breathing rate. Talking out loud can help. Having them breath into a paper bag can help reintroduce carbon dioxide into the lungs.

### **What are the in-flight illusions? ICEFLAGS (AIM 8-1-5) (PHAK 16-6)**

**I**nversion – Abrupt change in altitude creates the illusion of tumbling backwards

**C**oriolis – Rapid head movement causes the illusion of accelerating or turning

**E**levator – An updraft causes the pilot to think that aircraft is in a climb. Pilot reacts by forcing the nose down inducing a dive.

**F**alse Horizon – Sloping cloud formations or obscured horizons confuse the pilot into misaligning with the horizon.

**L**ears – Abrupt recovery from a roll can mislead pilot into thinking aircraft is in a turn in the opposite direction.

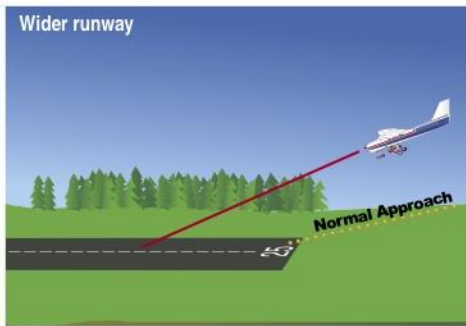
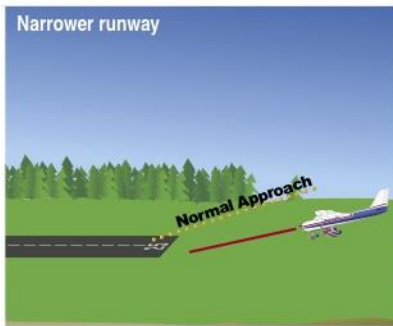
**A**utokinesis – At night, stationary lights may appear to be in motion. Pilot may lose control of aircraft trying to align it with “moving” light.

**G**raveyard Spiral – In a prolonged constant rate turn, sensation of the turn is not felt. In recovery to straight and level, the pilot may sense a turn in the opposite direction and pull back on the yoke, only tightening the spiral.

**S**omatogavic – Rapid acceleration causes the illusion of the being in a nose up attitude. Rapid deceleration will have the opposite effect.

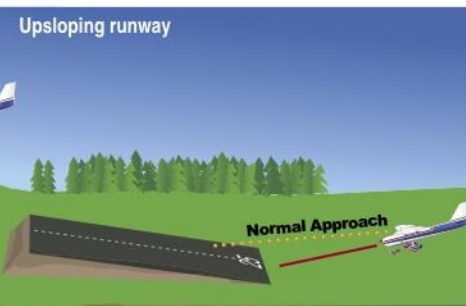
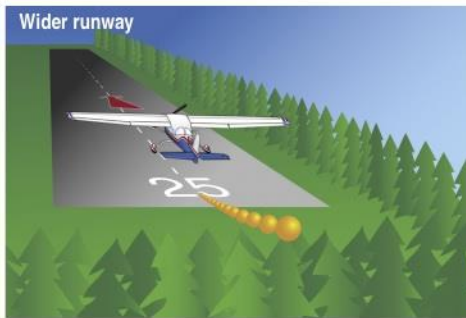
**What are the runway illusions?**





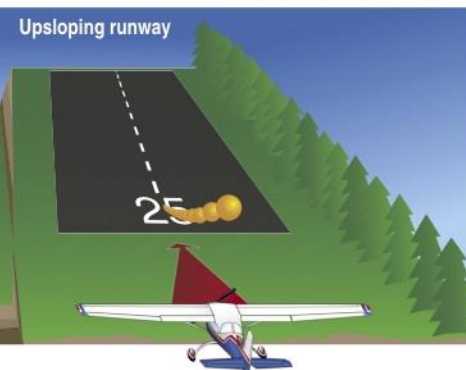
### Runway width illusion

- A narrower-than-usual runway can create an illusion that the aircraft is higher than it actually is, leading to a lower approach.
- A wider-than-usual runway can create an illusion that the aircraft is lower than it actually is, leading to a higher approach.



### Runway slope illusion

- A downsloping runway can create the illusion that the aircraft is lower than it actually is, leading to a higher approach.
- An upsloping runway can create the illusion that the aircraft is higher than it actually is, leading to a lower approach.



- Normal approach
- Approach due to illusion

## **Aeronautical Decision Making (PHAK Chapter 17)**

### **What is the definition of ADM?**

A systematic approach to risk assessment and stress management. The two defining elements of ADM are hazard and risk.

### **What are the hazardous attitudes and their antidotes? **RAIIM****

**R**esignation – The feeling of uselessness or inability or effect change. A pilot who exhibits resignation is essentially a victim of circumstance.

Antidote: I am not helpless. I can make a difference.

**A**ntiauthority – Disregard for regulations. This is the “Don’t tell me what to do” attitude.

Antidote: Follow the rules. They are usually right.

**I**mpulsivity – Acting without thinking.

Antidote: Not so fast. Think first.

**I**nvulnerability – The thought that “it can’t happen to me”.

Antidote: It could happen to me.

**M**acho – An attitude that “you can do it”. This is often associated with trying to impress others or show off.

Antidote: Taking risks is foolish.

### **What are some of the ways we can mitigate risk? **IMSAFE PAVE 5Ps****

**I**llness – Am I sick?

**M**edication – Am I taking any medication? If so, have I discussed with my AME if it is safe for flight?

**S**tress – Am I under psychological stress? School/Work? Money? Health? Family/Social life?

**A**lcohol – Have I been drinking within the previous 8 hours? Am I still experiencing the effect of alcohol?

**F**atigue – Have I gotten adequate rest?

**E**ating – Am I hungry?

**P**ilot – Am I ready for this trip (IMSAFE)? Are my certificates/ratings current? Am I proficient?

**A**ircraft – Is the airplane airworthy (**AVIATES**)? Does it have all of the required documentation (**ARROW**)? Is it equipped for the intended operation (**ATOMATOFLAMES/FLAPS**)? Can it carry the intended passengers/load (weight and balance/fuel)? Performance characteristics?

en**V**ironment – (**NWKRAFT**)

**E**xternal pressures – Are my passengers/employer urging me to get somewhere? Do I have stress influencing my life?

**P**ilot – physical fitness, currency, and proficiency

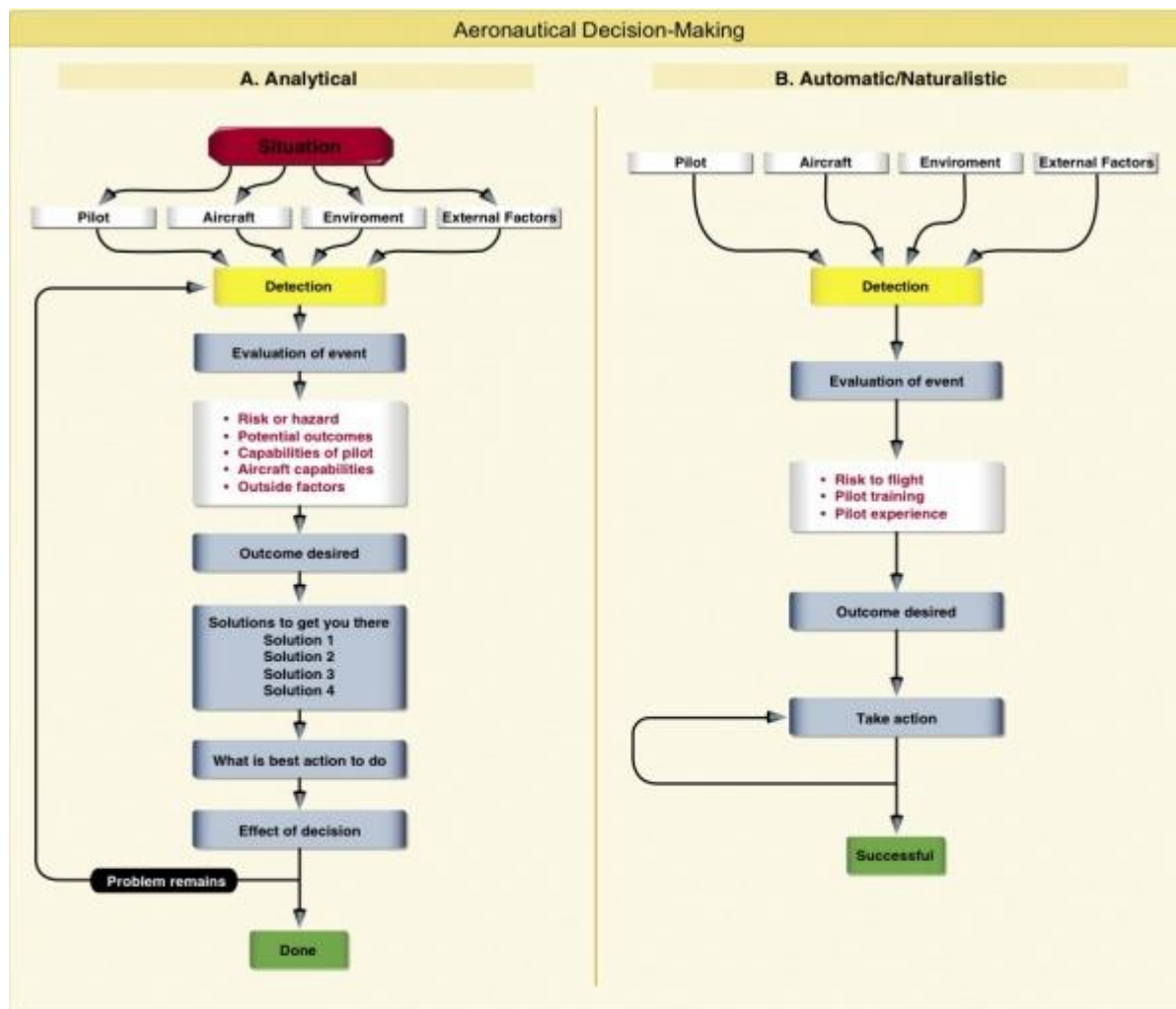
**P**assengers – Are they fit to fly? Are they comfortable flying?

**P**lane – Airworthiness and documentation

**P**rogramming – Are you proficient using the avionics? Are the GPS databases up to date?

**P**lan - (**NWKRAFT**)

## How do we assess risk in flight? **DECIDE**



### The DECIDE Model

1. **Detect.** The decision maker detects the fact that change has occurred.
2. **Estimate.** The decision maker estimates the need to counter or react to the change.
3. **Choose.** The decision maker chooses a desirable outcome (in terms of success) for the flight.
4. **Identify.** The decision maker identifies actions which could successfully control the change.
5. **Do.** The decision maker takes the necessary action.
6. **Evaluate.** The decision maker evaluates the effect(s) of his/her action countering the change.

### Special Emphasis Areas

- Positive exchange of flight controls
- Stall/Spin awareness
- Collision avoidance

- Wake turbulence avoidance (AIM 4-6-7) (PHAK 13-15)
- Land and Hold Short Operations (AIM 4-3-11)
- Runway incursion avoidance (PHAK 13-18)
- CFIT awareness
- ADM and risk management (personal minimums)
- Checklist usage
- TFRs
- Special use airspace
- Aviation security (1-866-GA-SECURE)
- SRM