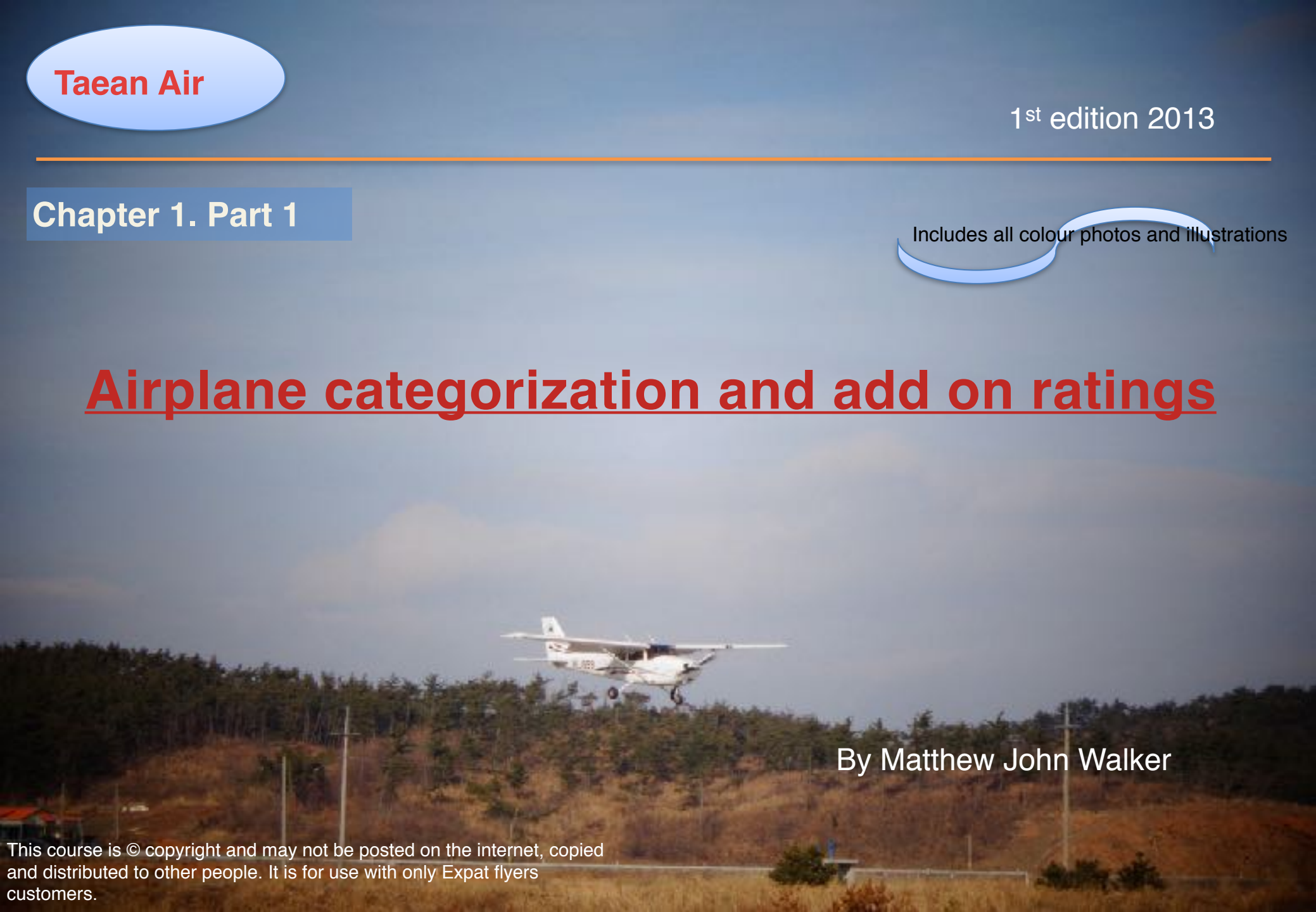


**Chapter 1. Part 1**

Includes all colour photos and illustrations

# **Airplane categorization and add on ratings**

By Matthew John Walker



# Expat flyers Private Pilot Ground school

## Learning to fly

Learning to fly is one of the most exciting and unforgettable times of your life.

Learning to fly contains both acquiring new and interesting knowledge as well as developing your coordination skills.

Once you have passed your private pilots license, you will be able to go out for day trips to places that may have been impossible to get to by other means of transportation.

You may also be able to use your plane to travel to work when your job is a long distance from home.

*No matter what your purpose is for getting a license ,there is one fact that is the same for all new pilots.*

***You will become the most popular new guy in town!!***

## About our course

The Expatflyers ground school course is divided into four separate modules. It will take a step by step look at learning aeronautical knowledge needed for acquiring a private pilots license.

Our course includes PDF files which allow you to take notes, question banks and some DVD streams to explain certain key areas.

We recommend students take the expat fundamentals course before starting the CBT ground school has it will help accommodate this course with practical flying skills and knowledge.

We hope you enjoy this course. If there are any parts of this course you do not understand, please send an e-mail with your question and we will get back with the answer.

# Private Pilot License

## Private pilots license

The private pilots license allows the most flexibility compared to other pilot ratings such as sports plane and recreational.

It allows the pilot to fly any General aviation airplane that is not a high performance, complex or multi engine airplane, however the pilot may fly these type of aircraft after obtaining additional training.

## Night Flight

The private pilots license also comes with a night rating.

The airspace at night is less congested and there are less delays to bigger airports. The air tends to be more stable and less turbulent at night.

## Eligibility Requirements

- Be 17 years of age
- Able to speak, read and write English
- Pass a Knowledge test
- Gain all flight experience for the practical test
- Receive a log book Endorsement
- Pass the practical test
- Pass a 3<sup>rd</sup> class medical.



# Private Pilot License

## Training Requirements for a private pilot

- Minimum of forty hours

### Dual requirements

- Twenty hours dual.
- One night cross country exceeding 100 NM
- Three hours Night.
- Ten take off and landings at night that are full stop. Each must be flown in the traffic pattern.
- Three hours instrument.
- Three hours of training for cross country.

### Solo requirements

- Ten hours solo
- Five hours solo cross country
- Three take off and landings to a full stop with an operating control tower
- Long distance cross country totaling 150 NM with one leg more than 50 NM long. Cross country must include three full stop landings at three points.

#Note: Although the minimum requirement for hours is only forty hours the national average is more around fifty five hours.

Flight training on a regular basis will help a student pass a test with lower hours than flying a few hours every other month.

# Student Pilots License

## Before Solo

A Student Pilot must have a students Pilots license and at least a class three medical before they can solo any general aviation airplane

The students license is first obtained when the pilot takes the pilots medical examination. The student license can also be obtained by a designated examiner or an FAA inspector.

## Medical Limitations

Certain Pilots may have a medical condition that will allow them to fly under certain circumstances.

In these cases the Aviation Medical Examiner (AME) will impose limitations on the pilot certificate.

## Student pilot/medical slip

The students pilots license is on the same slip as the medical certificate.

There are places for a flight instructor to endorse the pilot for solo operations on the reverse side of the medical.

***The student pilots license lasts 60 calendar months*** when the student is under forty years of age and twenty four calendar months when the student applies for the license with his birth age over forty at the time of application. The license will expire on the last day of the month after either sixty or twenty four months.

The applicant for a students license must be over sixteen years of age and be able to read, speak and write English.

# Types of medical

There are three types of medical. Private pilots, recreational pilots and flight instructors only need to obtain the lowest level of medical, which is level three. If a person is thinking about pursuing a career in aviation, it is recommended to get a class 2 or class 1 medical. Both class 2 and class 1 medicals may be used for exercising the privileges of a private pilot. A class 3 medical would not allow pilots to operate an aircraft as a commercial or airline transport pilot.

## Class 3 medical

Recreational, private pilot, student pilot, flight instructor, sports pilot without using a drivers license.

Under 40 years old	60 calendar months after the date of application
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Over 40 years old	24 calendar months after date of application
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## Class 2 medical

	Use as airline transport pilot second in command	Commercial pilot	Recreational, private pilot, student pilot, flight instructor, sports pilot without using a drivers license.
Under 40 years old	12 calendar months after date of application.	12 calendar months after date of application.	60 calendar months after the date of application
Over 40 years old	12 calendar months after date of application.	12 calendar months after date of application.	24 calendar months after date of application

The expiry date regarding airline transport pilot second in command and commercial pilot are the same for all ages.

# Types of medical

## Class 1 medical

	Use as airline transport pilot	Commercial pilot	Recreational, private pilot, student pilot, flight instructor, sports pilot without using a drivers license.
Under 40 years old	12 calendar months after date of application	12 calendar month after date of application	60 calendar months after the date of application
Over 40 years old	6 calendar months after date of application	12 calendar month after date of application	24 calendar months after date of application

Commercial pilot privileges are both the same for under and over forty years old.



# Regarding the certification of aircraft

## About aircraft categorization

Aircraft are all designed for a special purpose. An aircraft may be used for anything from flight training to defending the country.

For this purpose the FAA puts aircraft into different categories according to their operational requirements and limitations.

## The different types of aircraft category are:

- Experimental
- Restricted
- Aerobatic
- ELSA
- Utility
- Normal
- Transport
- SLSA



Above is a picture of a home builder and his project plane.

## Experimental Aircraft

Experimental aircraft are usually made by an individual home builder.

## Utility Aircraft

Utility aircraft are often used in flight training for upset recovery. This type of training contains limited aerobatics.

The pilot in the plane to the left is practicing spin recovery for a CFI rating.



# Aircraft categories regarding manufacturing

## Normal

Many general aviation and larger commercial airliners fall into this category. These planes may not do any kind of aerobatics.

## Restricted

Fire fighter airplanes, crop sprayers and fighter airplanes usually come under this category. These types of airplanes are not designed for general use.

## Sports Planes

Sports planes are the latest category in aircraft. These planes have a total take off weight of up to 600 kilo and a constant cruise speed of 138 mph.

A pilot who hold a drivers license does not require a medical to fly a sports airplane.

## Experimental sports plane (ELSA) and Special light sports plane SLSA

The SLSA is a factory manufactured sports plane. The ELSA is a amateur homebuilt. Both planes may not be used for business commerce. The SLSA may be used for giving flight instruction.



# Aircraft “class” regarding aircraft certification

Aircraft “Class” is a broad grouping of aircraft that have similar propulsion systems.

They also display the same type of flight, take off and landing characteristics.

An example of “class” with regards to aircraft certification are;

- **Balloon**
- **Glider**
- **Airplane**
- **Landplane**
- **seaplane**



The propulsion and landing characteristics are very different between these aircraft.



# Operational restrictions on aircraft

## Experimental airplanes Limitations

There are operation limitations on both experimental and restricted type aircraft.

These days many people are building their own airplanes from kit manufacturers. These airplanes are known as experimental. This is because the builder is technically the manufacturer of the plane. The options with different engines and instrument usually make the plane a one of a kind.

One main reason for building a plane due to costs. A brand new amateur built plane will cost less than half the price of a production airplane.

## Restricted airplanes Limitations

Some airplanes are classified as restricted because they are designed or registered for a special purpose that may involve carrying chemicals or items that could be dangerous. A plane used for crop spraying for example; may carry special chemicals that could be harmful if they came into contact with a person.

Skycatcher. Production airplane. Basic model from \$125,000. Built in China for Cessna aircraft.



Zenith Air 650. Kit (experimental) produced in America. It will costs less than \$65.000 to get in the air

Both restricted and experimental category aircraft are prohibited from carrying persons or property for compensation or hire.

Unless authorized by the administrator both experimental and restricted aircraft are prohibited from flying over densely populated areas or in congested airways

# Aircraft categories regarding manufacturing

With the respect to the certification of aircraft,  
Airplane, rotorcraft, glider and balloon are all classes of aircraft.





# Aircraft Categorization for Airmen

It is important to understand aircraft categorization as it will have a direct effect on training and license requirements.

## **Aircraft Categorization**

*Aircraft are divided into the following Categories*

**Airplane**

**Rotor Craft**

**Lighter than Air**

**Powered lift**

**Space Craft**

**They can then be divided further into separate classes**

Single Engine, multi engine, Sea plane, Land Plane

**Larger airplane will also have a type:**

- Boeing 727,
- Airbus A318
- Boeing Dreamliner



A pilot is only certified to fly the type of aircraft category and class that he/she possesses a license for. Changing a license for a new category or type of aircraft will require further training.

# Categories of aircraft for Airmen



Airplane



Lighter than Air



Rotorcraft



Space Ship

A pilot may fly more than one different category of aircraft. He or She would be required to do further training and a practical test.

The training hours would be less than what would be required for initial training.



Powered Lift



Glider



# Aircraft Class for Airmen

## Aircraft Class

An aircraft class is more specific than the category. Aircraft class usually refers to the aircraft operating on or off water and how many engines it has.

**The aircraft to the right is described as**

Category = Airplane

Class = Single Engine Land

Make = Piper Malibu



**The picture to the right is a**

Category = Airplane

Class = Single Engine sea plane



# Aircraft Make and Model for pilots licensing

## **Make and Model**

Make refers to the company who made the Aircraft such as Boeing, Cessna or Piper. Model refers to the brand which the manufacturer made such as a 172 or warrior.

## **Restrictions when training**

While on flight training a student will usually fly the same make and model airplane or Helicopter. During Solo practice the student pilot may only fly the particular make and model airplane the flight instruction was received in.

A Pilot may fly any make and model of plane after passing a private pilots license unless there are limitations by the FAA on a particular kind of airplane.



The plane above is a piper archer 2

## **Lifting make and model restrictions**

There are no restrictions on what make and model a private pilot flies. However training in a particular make and model may often be a requirement for some insurance companies.

A check out ride with an instructor can fulfill the insurance requirement. This is often done when flying a new plane at your local flight club.

# Transitional training and ratings

After a short time in your flying career you may want to step up to flying faster and more complex aircraft. This can be done by either completing transitional training with an authorized instructor or completing an add on rating for either class or category.

## Transitional training and ratings

Transitional training and rating courses are required for the following type of aircraft.

- Tail Wheel
- Complex
- High Performance
- High Pressurized
- Multi Engine
- Instrument
- Sea Plane



Transitional training requires training from an authorized instructor and a log book endorsement. An add on rating will involve flight training, written test and a practical exam.

# Transitional training for tail dragger (Conventional)



The DC3 was a very popular freight plane. The tail wheel made good clearance for the propellers and easy access through the cargo door

## Tail Wheel Airplanes

Tail wheel airplanes may also be referred to as conventional type airplanes. In the early days of aviation many airplanes operated from dirt strips and grass runways.

## Tail Wheel Design

Airplane designers and manufacturers needed to design a plane that was simple in design and could provide adequate propeller clearance from the ground. A trike airplane on grass may suffer damage to the nose section if it hits a pot hole at a fast speed. This makes the tail dragger more suited to unimproved runways.

## Problems with the Tail wheel design

The tail wheel (dragger) has some unwanted characteristics that could cause the pilot to lose control during take off or landing. This is known as a ground loop.

## Training required

Pilot must have training and receive a log book endorsement from an authorized flight instructor before flying acting as pilot in command of a tail wheel airplane.

# Transitional training for Complex Aircraft

## **About Complex Airplanes**

A complex aircraft is an aircraft that has flaps, Retractable undercarriage and a constant speed propeller.

It is a great plane for touring or training for commercial pilots as it starts to introduce more systems used on larger airplanes.

### **A complex airplane**

1. Will have a better climb gradient compared to similar fixed pitch propeller model airplanes.
2. Better fuel Efficiency and higher cruise speed due to the constant speed propeller and retractable undercarriage.
3. The flaps have the same purpose as any other General Aviation Airplane.
4. The plane will also descend faster because of the low pitch setting on the propeller during landing.



### **More complex systems**

Due to the more complex systems with this type of airplane, a pilot must have both ground school and flight training by an authorized instructor.

The instructor will endorse the pilots log book after he has been found competent to fly the airplane.



# Transitional training for High Performance or high altitude

## High performance aircraft

High performance airplanes are planes with engines that are over 200 HP.

A pilot must receive flight training and receive a log book endorsement from an authorized instructor before flying as pilot in command.



## High Altitude Training

Pilots who wish to fly airplanes that fly in excess of 24,000 feet must complete further training and ground instruction from an authorized instructor.

The instruction is needed due to the risk of hypoxia and changes in weather at high altitude.



Aircraft capable of high altitudes are usually high performance airplanes. A flight instructor endorsement, flight and ground training is required before acting as pilot in command of these type of airplane.



# Multi engine airplane class rating

## About Multi Engine Airplanes

We can divide multi engine airplanes into several categories

- Light
- Medium
- Heavy

The engines may be either

- Aspirated
- Turbo charged
- Jet propulsion

About General Aviation Multi Engine Airplanes

Many multi engine general aviation airplanes today are either a light to medium category. Most of these planes carry four to six passengers.

## Extra Safety

A multi engine plane can offer a little more comfort and safety if flying over large bodies of water or over mountains.



Above is a picture of a piper seneca

The Piper Seminole is a four seat plane used mostly for training while the bigger Seneca has six seats.

# Multi engine class rating



## Multi Engine Flight test

There is no written test if the pilot takes a practical test at the same level as his/her single engine rating.

A commercial Single Engine Pilot may take the Multi Engine Test at either Commercial or Private Pilot Level if he wishes. On the other hand a Private Pilot may choose to do a commercial Pilot license in a twin without taking a single engine commercial license.

## Multi Engine Training

More complex systems requires additional ground school and flight training. Pilots need to learn emergency procedures which includes flying the airplane on one Engine. There is no official minimum hours to train, but it is usually around ten hours.



A practical test is required for a class add on to your license, there is no set amount of hours or written test required if the test is for the same pilot level.

# Instrument rating

**An instrument rating Increases both safety and gives more opportunities to fly.**

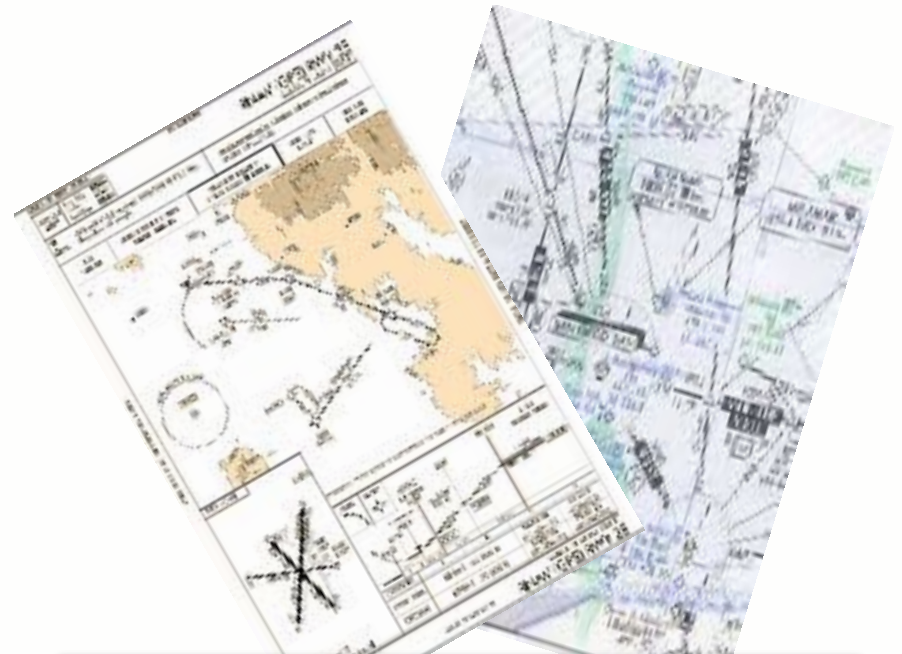
An instrument rating will open up new opportunities to fly to busier airports as well as get in and out of areas of low visibility.

It will also increase your flying skills and contribute towards safer flying practices.

Some non-rated instrument pilots come into certain dangers when flying in areas of low clouds. They may tend to want to fly below the clouds and this could have a disastrous result if the flight takes place in an area of high terrain.

Having an instrument rating will allow you to change from a VFR flight to an IFR flight in low visibility and avoid controlled flight into terrain.

It will also help with flying into busier airports as ATC can sequence IFR traffic easier.



## **An applicant for an instrument flight test will need:**

- 50 hours flying as pilot in command on a cross country
- 40 hours practice under simulated IFR conditions
- 15 hours flight training with an instructor
- Pass a knowledge and practical exam.

# Seaplane Class rating

In some areas it is not always possible to land due to terrain or other problems associated with the land. There may however be a lake, river or the sea which would make getting in and out of the area possible with a sea plane.

A seaplane may also increase added safety if the plane is frequently operated over water.

**Seaplanes bring a lot of excitement into the world of aviation.**

There are three different types of seaplane. These planes are known as

- Sea boat/flying boat
- Float Plane
- Amphibian



Sea boat/flying boat: It has a single main float which is shaped a little similar to the hull of a boat.



A float plane has floats located on both sides of the fuselage. The float plane above also has wheels for landing on land. Planes that land on land and water are called amphibious airplanes.

A pilot must take training and a practical test before flying any type of seaplane.



# Category rating for glider

## Learning to fly a glider will enhance your piloting skills

Flying a glider will also help develop new skills such as soaring and help develop your landing skill as there is no engine to do a go around.

Gliders can be launched by a winch or by being towed by another airplane.

On a good day with lots of thermal activity a pilot may be able to sustain flight for hours.

To add a glider rating on to a private pilots license you will need to:

- **Complete 3 hours of flight training in a glider**
- **Complete 10 solo flights**
- **Have more than forty hours flight experience in an aircraft heavier than air.**



# Balloon

Some people may wish the opportunity to fly in a balloon. Flying in a balloon is a lot slower than most other types of flying.

The slower speeds and low altitudes will allow you to appreciate what is down below. Many balloon tours in the world take place over some of the most spectacular scenery in the world.

The ideal conditions to fly in a balloon are:  
2 -3 hours after sunrise or 2-3 hours before sunset. These times take advantage of Calm winds and more stable air.

## **A balloon rating is based on:**

- Ten hours flight training.
- Six training flights.



Only a practical test is required for a balloon rating.



# Airplane Type Rating

## Type ratings are required for operating the following types of airplane

- Airplane weighing over 5,700 KG
- Airplane that requires more than one crew member
- Airplanes with Turbofan engines
- Any other airplane noted by the aviation governing body.



Some larger single engine airplanes such as the Piper Malibu and Cessna Caravan may require special type ratings.

Flight training, written tests on the airplane type as well as a practical test is needed before flying as Pilot in Command of one of these planes.